CHAPTER 2

BASIC PLANNING DATA AND WATER DEMAND FORECASTING

2.1 EXISTING SERVICE AREA

The existing water system serves a combination of residential, commercial and public users within the City. The boundary of the current retail water service area is shown on Figure 1-2. This figure also shows the areas served by the adjacent water systems of Selandia, High Valley, New Horizons, and Friday Point.

The existing retail service area consists of approximately 2,806 acres. Current land use within the City is presented in Table 2-1, and is shown on Figure 2-1, Existing Land Use Map.

TABLE 2-1 EXISTING LAND USE WITHIN SELAH CITY LIMITS*

Zoning Category	Total Acreage	Percent of Total
Single Family Residential	542.2	19.3%
Two Family Residential	48.9	1.8%
Multiple Family Residential	23.1	0.8%
Commercial	57.4	2.1%
Industrial	79.1	2.8%
School	193.2	6.9%
Semi-Public	194.2	6.9%
Parks and Recreation	32.8	1.2%
Utilities / Communications	267.9	9.5%
Agricultural / Vacant	1,367.2	48.7%
TOTAL	2,806.0	100.0%

* Source: Selah Urban Growth Area Comprehensive Plan, January 2005

Agricultural / vacant area is the largest land use within the City, comprising approximately 1,367.2 acres (48.7% of the land within the City Limits). Of the developed lands, residential use predominates, comprising approximately 614.2 acres (21.9%) of the total land within the City. Residential housing in Selah is dominated by single-family units.

Most Retail / Business development (Commercial land use) is along First Street, Naches Avenue in the vicinity of First Street, and in the area around the intersection of North Wenas and East Goodlander Road. Industrial development within Selah comprises approximately 79.1 acres (2.8% of the land within the City), and is generally along the railroad tracks. Selah has approximately 387.4 acres of Public and Semi-Public lands (13.8% of the land within the City) which include municipal offices, the Civic Center, the library, and churches.

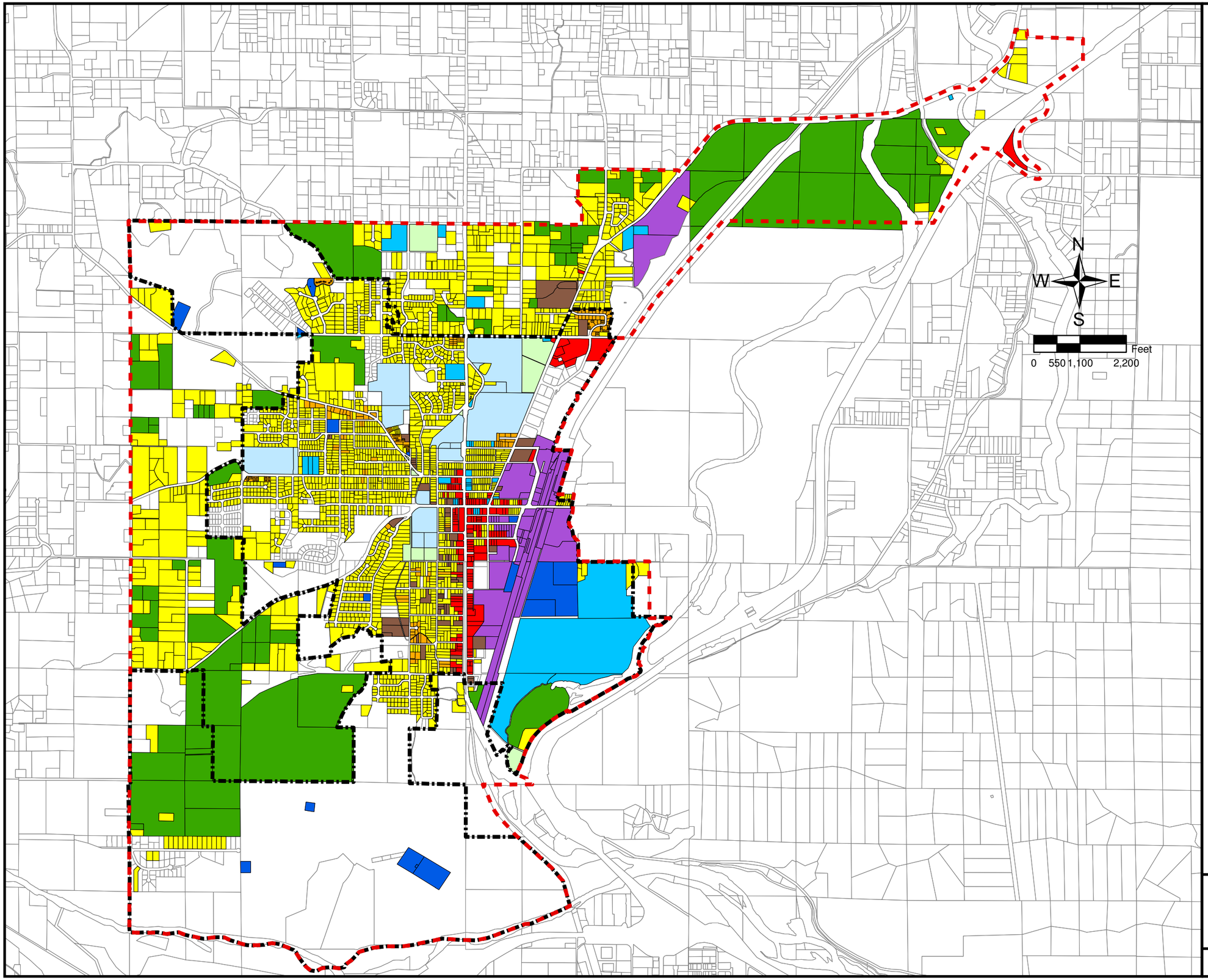
The City of Selah and Yakima County established the Urban Growth Area (UGA) for Selah in 1997 as part of the Growth Management Act (GMA) planning process, and changes to that UGA were made as part of Selah's 2005 Urban Growth Area Comprehensive Plan. The UGA represents the projected future retail service area that the City may be able to provide and maintain services, including water service. The boundary of the UGA is shown on Figure 2-1.

Current land use within the Selah Urban Growth Area (UGA) is presented in Table 2-2, and is shown on Figure 2-1 - Existing Land Use Map.

CITY OF SELAH

Comprehensive Water Plan Update

EXISTING LAND USE MAP



LEGEND

- Selah UGA Boundary
- Selah City Limits
- Agriculture
- Commercial
- Industrial
- Parks and Recreation
- Semi-Public
- Single Family Residential
- Two Family Residential
- Multiple Family Residential
- School
- Utilities/Communications
- Vacant

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FIGURE 2-1

TABLE 2-2 EXISTING LAND USE WITHIN SELAH'S UGA*		
Zoning Category	Total Acreage	Percent of Total
Single Family Residential	549.4	27.1%
Two Family Residential	3.9	0.2%
Multiple Family Residential	14.9	0.7%
Commercial	4.3	0.2%
Industrial	131.3	6.5%
School	18.6	0.9%
Semi-Public	0.0	0.0%
Parks	9.8	0.5%
Transportation / Utilities	229.2	11.3%
Agricultural / Vacant	1,068.6	52.6%
TOTAL	2,030.0	100.0%
* Source: Selah Urban Growth Area Comprehensive Plan, January 2005		

Agricultural / vacant area is the largest land use within Selah's UGA, comprising approximately 1,068.6 acres (52.6% of the land within the UGA). Of the developed lands, residential use predominates, comprising approximately 568.2 acres (28.0%) of the total land within the Selah UGA.

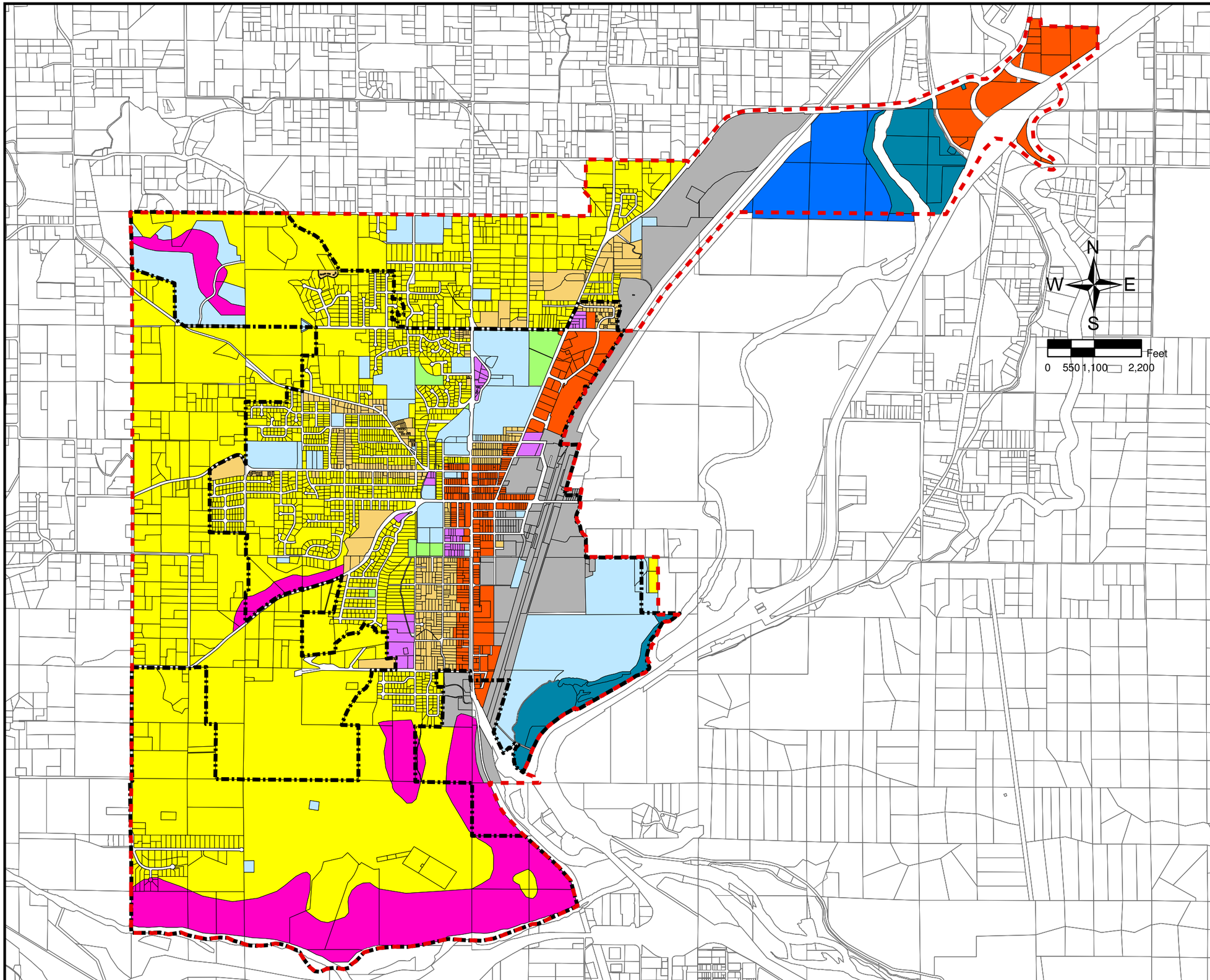
2.2 FUTURE SERVICE AREA

Developed as part of their 2005 Urban Growth Area Comprehensive Plan, Selah's future land use establishes the framework for amendments to the City's official zoning map, and establishes the land use and zoning framework as land is annexed into the City. Future land use within the City is presented in Table 2-3, and is shown on Figure 2-2 - Future Land Use Map. Future land use within the UGA is presented in Table 2-4, and is shown on Figure 2-2 - Future Land Use Map.

CITY OF SELAH

Comprehensive Water Plan Update

FUTURE LAND USE MAP



LEGEND

- Selah UGA Boundary
- Selah City Limits
- Low Density Residential
- Moderate Density Residential
- High Density Residential
- Commercial
- Industrial
- Industrial Sprayfield
- Parks
- Quasi-Public Open Spaces
- Floodway
- Steep Slopes

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FIGURE 2-2

TABLE 2-3 FUTURE LAND USE WITHIN SELAH CITY LIMITS		
Zoning Category	Total Acreage	Percent of Total
Low Density Residential	1,252.8	44.7%
Moderate Density Residential	126.7	4.5%
High Density Residential	57.4	2.0%
Commercial	114.1	4.1%
Industrial	206.5	7.3%
Industrial Sprayfield	0.0	0.0%
Parks	30.6	1.1%
Quasi-Public Open Spaces	369.9	13.2%
Floodway	48.6	1.7%
Transportation / Utilities	229.2	8.2%
Steep Slopes	370.2	13.2%
TOTAL	2,806.0	100.0%

TABLE 2-4 FUTURE LAND USE WITHIN SELAH'S UGA		
Zoning Category	Total Acreage	Percent of Total
Low Density Residential	1,203.8	59.3%
Moderate Density Residential	54.2	2.7%
High Density Residential	0.0	0.0%
Commercial	90.9	4.5%
Industrial	180.9	8.9%
Industrial Sprayfield	140.9	6.9%
Parks	0.0	0.0%
Quasi-Public Open Spaces	28.7	1.4%
Floodway	74.0	3.7%
Transportation / Utilities	191.5	9.4%
Steep Slopes	65.1	3.2%
TOTAL	2,030.0	100.0%

2.3 POPULATION

Current Population

According to the U.S. Census Bureau, the 2000 population of the City of Selah was 6,310, an increase of 1,197 people since 1990. Selah's growth rate for the period 1990-2000 was approximately 2.12% per year (23.4% for the ten-year period). Population increases for the thirty-year period 1970-2000 averaged 24.3% per decade. Population trends in Selah, Yakima County, and the State of Washington for the period 1910 through 2000 are presented in Table 2-5.

TABLE 2-5 POPULATION TRENDS						
Year	City of Selah		Yakima County		State of Washington	
	Population	Percent Change	Population	Percent Change	Population	Percent Change
1910			41,709		1,141,990	
1920			63,710	52.7%	1,356,621	18.8%
1930	767		77,402	21.5%	1,563,396	15.2%
1940	1,130	47.3%	99,019	27.9%	1,736,191	11.1%
1950	2,489	120.3%	135,723	37.1%	2,378,963	37.0%
1960	2,824	13.5%	145,112	6.9%	2,853,214	19.9%
1970	3,311	17.2%	145,212	0.1%	3,413,244	19.6%
1980	4,500	35.9%	172,508	18.8%	4,132,353	21.1%
1990	5,113	13.6%	188,823	9.5%	4,866,692	17.8%
2000	6,310	23.4%	222,581	17.9%	5,894,121	21.1%

The Washington Office of Financial Management (OFM) has developed population estimates for the City of Selah, Selah's UGA, and for Yakima County since the 2000 census as shown on Table 2-6.

TABLE 2-6 POPULATION PROJECTIONS			
Year	City Population Estimate	UGA Population Estimate	Yakima County Population Estimate
2001	6,405	1,383	224,500
2002	6,370	1,419*	225,000
2003	6,500	1,455*	226,000
2004	6,625	1,491*	227,500
2005	6,740	1,527*	229,300
2006	6,840	1,563*	231,800
* Estimate based on 2001 UGA population with same percent increase as the City OFM population estimate.			

Location of Current Service Population

The location of the population of a purveyor whose water system includes multiple distribution pressure levels is critical in assessing the demands on the various water system components. Although the precise population residing within each pressure zone may be unknown, it is possible to estimate the population based upon the number of services within each zone.

The number of Single-Family Residential water services in 2005 within Selah's water distribution pressure zones is shown in Table 2-7. These values include the 38 Single-Family Residential Services currently within the UGA that are served by the Selah water system. Based upon the number of residential services, Table 2-7 also shows the year 2005 estimated population within each pressure zone.

TABLE 2-7 2005 SERVICES AND POPULATION BY PRESSURE ZONE					
	Zone 1	Zone 2	Zone 3	Zone 4	Total
Number of Single-Family Residential Services [a]	942	615	311	52	1,920
Estimated Residential Population [b, c]	2,562	1,673	846	141	5,222

a Does not include 38 Single-Family Residential Services within the UGA currently served by the Selah water system.
b Includes population from single family residential services only; does not include residential population living in multi-family residential units.
c Assumes 2.72 persons per residence as determined by the 2000 US Census.

Future City and UGA Population

Selah updated its Growth Management Act (GMA) Comprehensive Plan in 2005. As part of that process, Selah, in conjunction with Yakima County, developed 20-year population projections for the City and the UGA through the year 2025. For this Plan, those population projections have been extended through the year 2027 and are presented on Table 2-8.

TABLE 2-8 CITY AND UGA POPULATION PROJECTIONS				
Year	City Population Projection	City Increase from 2006	UGA Population Projection	UGA Increase from 2006*
2013	8,152	1,312	1,815	252
2017	8,902	2,062	1,958	395
2027	10,777	3,937	2,318	755

* Increase from 2006 estimate of 1,563, shown in Table 2-6.

Future Service Population

Table 2-8 presents the projected City and UGA populations through the year 2027. The Selah water system currently provides water to 38 residential and one commercial service outside the City Limits but within the UGA. For water system planning purposes, it is assumed that the Selah water system will serve all customers within the City Limits and will serve a number of customers outside the City but within the UGA similar to the number currently served. The total population projected to be served by the Selah water system over the next 20-year period is shown in Table 2-9.

TABLE 2-9 FUTURE WATER SYSTEM SERVICE POPULATION			
Year	City Service Population	Outside Service Population*	Total Service Population
2013	8,152	103	8,255
2017	8,902	103	9,005
2027	10,777	103	10,880

* Assumes the City will provide water to an average of 38 single-family residential services outside the City but within the UGA, with an average number of persons per household of 2.72, based on the 2000 US Census value for the City of Selah.

Location of Future Residential Population

The location of the future residential water service population is expected to be as shown in Table 2-10.

TABLE 2-10 LOCATION OF FUTURE RESIDENTIAL WATER SERVICE POPULATION*

Year	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Total
2013	3,756	1,923	1,134	653	82	109	598	8,255
2017	3,658	2,040	1,385	861	82	109	870	9,005
2027	3,470	2,222	1,678	1,177	143	333	1,858	10,880

* Includes an outside service population of 103.

2.4 FUTURE RESIDENTIAL WATER SERVICES

In reviewing future population and housing projections, the Selah City Council became aware of the impacts on the City's existing water rights and reservoir storage capacity that providing water service to residents of the City and the UGA would create. As a result, the Selah City Council determined the City would only provide water service to new customers within Selah's UGA under the following conditions:

1. All costs associated with providing water service, e.g., extending water mains to the site, shall be the responsibility of the proponent/developer;

2. The City maintains adequate water rights capacity per DOH's required "water rights self-assessment," to serve the proposed property/properties;

3. The City maintains adequate physical source and/or storage capacity to serve the proposed property/properties;

4. The proponent/developer shall transfer all potable water rights and irrigation water rights/shares associated with the property to the City;

5. The proponent/developer shall "decommission" any and all groundwater wells on the property in accordance with the applicable Washington Administrative Code (WAC) requirements, unless a well is to become part of the City's water system; and

6. Service will not be provided to proposed structures which have fire flow requirements greater than the capacity of the system. The cost of upgrading the existing water system which is required by a development to meet fire flow requirements shall be the responsibility of the developer, including, but not limited to:

    a. Upsizing existing water mains;
    b. Looping of the distribution system by installing new water mains; and
    c. Increasing storage and/or pumping capacities.

Based upon the City's decision, and population and housing projections, the total number of future residential water services is shown in Table 2-11.

TABLE 2-11 FUTURE RESIDENTIAL WATER SERVICES				
Year	Single Family Residential Services	Multiple Family Residential services	Outside Single Family Residential Services	Total Residential Services
2013	2,427	57	38	2,522
2017	2,697	63	38	2,798
2027	3,370	79	38	3,487

The location of future residential services is expected to be as shown in Table 2-12.

TABLE 2-12 LOCATION OF FUTURE RESIDENTIAL WATER SERVICES*								
Year	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Total
2013	1,003	635	363	257	30	40	194	2,522
2017	1,003	685	436	310	30	40	294	2,798
2027	1,003	739	539	413	33	113	647	3,487
* includes 38 outside services.								

2.5 CURRENT WATER CONSUMPTION AND PRODUCTION

Current Water Consumption

At the present time, water consumption data is maintained by computer database at Selah City Hall. Services are divided into the following categories:

1. Single Family Residential Services
2. Single Family Residential Services outside the City
3. Multi-Family Residential Services
4. Commercial Services
5. Commercial Services outside the City
6. Large Industrial Services
7. Industrial Services
8. Government Services
9. Irrigation Only Services

All services are metered, and the meters are read monthly with the exception of residential services. Residential services are read monthly, except for the months of November, December, January and February, when consumption is estimated based on average day demand in the winter months. The number of metered water system services and annual consumption for the period 2001 through 2005 are presented in Table 2-13 and Table 2-14, respectively.

TABLE 2-13 METERED WATER SYSTEM SERVICES BY USER CATEGORY 2001 - 2005						
User Type	2001	2002	2003	2004	2005	Average
Single-Family Residential	1,791	1,368	1,556	1,797	1,920	1,686
Outside Single-Family Residential	0	19	30	33	38	24
Multi Family Residential	46	42	43	44	45	44
Commercial	121	104	116	126	133	120
Outside Commercial	0	0	0	0	1	0
Large Industrial	2	2	2	2	2	2
Industrial	5	5	5	5	5	5
Government	28	37	36	40	41	36
Irrigation Only	0	28	33	29	34	25
TOTAL	1,993	1,605	1,821	2,076	2,219	1,943

TABLE 2-14 WATER CONSUMPTION BY USER CATEGORY 2001 - 2005 (values are in Million Gallons per year)						
User Type	2001	2002	2003	2004	2005	Average
Single-Family Residential	330.897	273.419	315.350	344.521	344.549	321.747
Outside Single-Family Residential	0.000	3.833	6.714	6.535	6.742	4.765
Multi Family Residential	27.288	28.302	28.689	28.742	27.137	28.032
Commercial	32.145	25.921	27.399	28.327	28.142	28.387
Outside Commercial	0.000	0.000	0.000	0.000	0.117	0.023
Large Industrial	376.638	236.690	180.261	200.154	207.536	240.256
Industrial	18.052	20.880	23.409	21.231	33.058	23.326
Government	75.523	72.955	72.860	72.297	55.911	69.909
Irrigation Only	0.000	25.417	28.278	25.837	26.293	21.165
TOTAL	860.543	687.417	682.960	727.644	729.485	737.606

During the period 2001 through 2005, the total number of services increased from 1,993 to 2,219, an 11.3% increase. However, during the same period, the volume of water consumption decreased from 860.543 MG to 729.467 MG, a 15.2% decrease. The reason for the decrease was the closing of one of the City's large industrial services. The volume of large industrial water consumption decreased from 376.638 MG in 2001 to 236.690 MG in 2002. A new large industrial service began operation in 2004, but the water use by large industrial services has not returned to the 2001 volume. Since 2002, the volume of water consumed by all services has increased from 687.417 MG to 729.467 MG, an increase of 6.1%. Table 2-15 provides average daily metered water consumption for the various user categories for the period 2001 through 2005.

TABLE 2-15 METERED WATER CONSUMPTION BY USER CATEGORY 2001 - 2005 (values are in gallons per service per day)						
	2001	2002	2003	2004	2005	Average
Single-Family Residential	506	548	555	525	492	525
Outside Single-Family Residential	0	553	613	543	486	549
Multi Family Residential	1,625	1,846	1,828	1,790	1,652	1,748
Commercial	728	683	647	616	579	651
Outside Commercial	0	0	0	0	321	321
Large Industrial	515,942	324,233	246,933	274,184	284,296	329,118
Industrial	9,892	11,441	12,827	11,633	18,114	12,781
Government	7,390	5,402	5,545	4,952	3,736	5,405
Irrigation Only	0	2,487	2,348	2,441	2,119	2,349

With the exception of 2001, year 2005 was the largest annual consumption on record. A breakdown of water consumption by user category for 2005 is shown in Table 2-16.

TABLE 2-16 SELAH 2005 ANNUAL WATER CONSUMPTION				
Services	Annual Consumption (Million Gallons)	Average Day Consumption (gallons)	Average Annual Consumption per Service (Gallons)	Average Day Consumption per Service (Gallons)
Single-Family Residential Services (1,920 each)	344.549	943,970	179,453	492
Outside Single-Family Residential Services (38 each)	6.742	18,471	177,421	486
Multi Family Residential Services (45 each)	27.137	74,348	603,044	1,652
Commercial Services (133 each)	28.142	77,101	211,594	579
Outside Commercial Services (1 each)	0.117	321	117,000	321
Large Industrial Services (2 each)	207.536	568,592	103,768,000	284,296
Industrial Services (5 each)	33.058	90,570	6,611,600	18,114
Government Services (41 each)	55.911	153,181	1,363,683	3,736
Irrigation Only Services (34 Seasonal Services)	26.293	72,036	773,324	2,119
TOTAL SERVICES (2,219 each)	729.485	1,998,589	328,745	901

The maximum month of water consumption was experienced in July 2004 when 101.139 MG of water were consumed. A breakdown of water consumption by user category for July 2004 is shown in Table 2-17.

TABLE 2-17 SELAH MAXIMUM MONTH WATER CONSUMPTION, JULY 2004

Services	Maximum Month Consumption (Gallons)	Average Day Consumption (Gallons)	Maximum Month Consumption per Service (Gallons)	Average Day Consumption per Service (Gallons)
Single-Family Residential Services (1,835 each)	58,216,092	1,877,938	31,725	1,023
Outside Single-Family Residential Services (34 each)	1,146,684	36,990	33,726	1,088
Multi Family Residential Services (44 each)	3,399,660	109,666	77,265	2,492
Commercial Services (126 each)	3,799,840	122,575	30,157	973
Outside Commercial Services (0 each)	0	0	0	0
Large Industrial Services (2 each)	13,545,532	436,963	6,772,766	218,476
Industrial Services (5 each)	2,002,396	64,593	400,479	12,919
Government Services (45 each)	12,739,936	410,966	283,110	9,133
Irrigation Only Services (42 Seasonal Services)	6,288,436	202,853	149,725	4,830
TOTAL SERVICES (2,133 each)	101,138,576	3,262,535	47,416	1,530

The maximum day water production was experienced on July 2, 2004, when 4.130 MGD was pumped into the system. The calculated 2003 annual non-revenue water percentage of 7.5% (See Table 2-20) was subtracted from the maximum day production volume for July 2, 2004, resulting in a total maximum day consumption volume of 3.820 MGD, as shown in Table 2-18. Average day consumption per user category was calculated by using the same percentage breakdown of maximum month consumption per user category as in Table 2-17 (i.e. single family residential maximum month consumption for July 2004 is 58% of the total maximum month consumption for July 2004). Peak Hour demand, also shown in Table 2-18, has been calculated by dividing the maximum day demand by 1,440 minutes per day and then multiplying by a factor of two.

TABLE 2-18 SELAH CALCULATED MAXIMUM DAY AND PEAK HOUR WATER CONSUMPTION JULY 2, 2004				
Services	Calculated Maximum Day Consumption (Gallons)	Calculated Maximum Day Consumption Per Service (Gallons)	Calculated Peak Hour Demand (GPM)	Calculated Peak Hour Demand per Service (GPM)
Single-Family Residential Services (1,835 each)	2,198,963	1,198	3,054	1.7
Outside Single-Family Residential Services (34 each)	43,313	1,274	60	1.8
Multi Family Residential Services (44 each)	128,413	2,918	178	4.1
Commercial Services (126 each)	143,529	1,139	199	1.6
Outside Commercial Services (0 each)	0	0	0	0.0
Large Industrial Services (2 each)	511,648	255,824	711	355.3
Industrial Services (5 each)	75,635	15,127	105	21.0
Government Services (45 each)	481,218	10,694	668	14.9
Irrigation Only Services (42 Seasonal Services)	237,530	5,655	330	7.9
TOTAL SERVICES (2,133 each)	3,820,250*	1,791	5,306	2.5

* 4,130,000 gallons production less 7.5% non-revenue water (2004 average non-revenue water) to arrive at a total calculated maximum day consumption of 3,820,250 gallons.

Water Production

Annual water production by source well for the period 2003 through 2005 is presented in Table 2-19. Water production for 2001 and 2002 is not available.

TABLE 2-19 SELAH ANNUAL WATER PRODUCTION 2003 - 2005 (values are in Million Gallons)			
Well Number	2003	2004	2005
Wells No. 3 & 4	283.970	197.697	168.057
Well No. 5	231.572	309.990	270.685
Well No. 6	133.940	183.090	188.176
Well No. 7	153.315	96.022	170.438
TOTAL	802.797	786.799	797.356

Non-Revenue Water

Table 2-20 shows the annual metered water production, annual metered water consumption (revenue water), and the difference between production and consumption, including the non-revenue water percentage. Water production from Selah's source wells for the period 2003 through 2005 totaled 2,387.0 million gallons. Consumption during that same time period totaled 1,140.1 millions gallons. The difference between production and consumption for that period is 246.8 million gallons, or 10.3% of total water production for the period. Over the past two years (2004 through 2005), the difference between production and consumption was only 8.0% of total water production. The reason for the decline in non-revenue water may be due to installation of a new telemetry system in 2001 and more accurate record keeping of both production and consumption values.

TABLE 2-20 SELAH ANNUAL METERED WATER PRODUCTION, CONSUMPTION AND NON-REVENUE WATER 2003-2005

(Values are in Million Gallons)

Year	Water Production	Consumption (Revenue Water)	Non-Revenue Water	% Non-Revenue
2003	802.797	682.959	119.838	14.9%
2004	786.799	727.660	59.139	7.5%
2005	797.356	729.486	67.870	8.5%
Total	2,386.952	2,140.105	246.847	10.3%

The City will continue to track the difference between production and consumption, and will attempt to further reduce the volume of non-revenue water through the timely repair or replacement of broken service meters and the annual calibration of production meters on the source wells.

Current Equivalent Residential Units

An Equivalent Residential Unit (ERU) is defined as the amount of water consumed by a typical full-time single-family residence. The actual quantity of water represented by an ERU is related to the time period being considered. For example, the ERU values for a single family home can be expressed as average daily demand (ADD), as maximum day demand (MDD), and as peak hour demand (PHD).

Year 2005 was the year of greatest total water consumption with 344.549 MG consumed by single-family residential services, and an average day consumption per service of 492 gallons. However, single-family residential ADD has varied during the period 2001 through 2005 from a low of 492 gallons per service per day to a high of 555 gallons per service per day. Due to fluctuations in single-family residential ADD between these years, the ADD from the peak year of consumption (2005) will not be used for calculating ERU values. Therefore, the average of the ADDs for the period 2001 through 2005, for all user categories, will be used to determine ERU values. Table 2-21 presents the average ADD per service by user category, for the period 2001 through 2005.

TABLE 2-21 AVERAGE DAY DEMAND PER SERVICE BY USER CATEGORY 2001-2005						
Service Type	2001	2002	2003	2004	2005	Average
Single-Family Residential	506	548	555	525	492	525
Outside Single-Family Residential	---	553	613	543	486	549
Multi-Family Residential	1,625	1,846	1,828	1,790	1,652	1,748
Commercial*	728	683	647	616	579	651
Large Industrial	515,942	324,233	246,933	274,184	284,296	329,118
Industrial	9,892	11,441	12,827	11,633	18,114	12,781
Government	7390	5402	5545	4952	3736	5405
Irrigation Only	---	2,487	2,348	2,441	2,119	2,349
* Includes the value for the Outside Commercial Service.						

Water demands by user category and the calculated Equivalent Residential Unit (ERU) factors for each user category are presented in Table 2-22. The water demands and ERU information provided in Table 2-22 are important tools for forecasting future water demand. The current number of ERUs, based on the number of services in 2005, is also presented in Table 2-22.

TABLE 2-22 WATER DEMANDS BY USER CATEGORY EQUIVALENT RESIDENTIAL UNIT FACTORS							
User Category	Average Annual (2001-2005)		Maximum Day (July 2004)		Peak Hour (July 2, 2004)		Total Current ERUs
	GPD/Service	ERUs	GPD/Service	ERUs	GPM/Service	ERUs	
Single-Family Residential	525	1.0	1,198	1.0	1.7	1.0	1,920
Outside Single-Family Residential	549	1.0	1,274	1.1	1.8	1.1	38
Multi Family Residential	1,748	3.3	2,918	2.4	4.1	2.4	149
Commercial*	651	1.2	1,139	1.0	1.6	0.9	161
Large Industrial	329,118	626.9	255,824	213.5	355.3	209.0	1,254
Industrial	12,781	24.3	15,127	12.6	21.0	12.4	122
Government	5,405	10.3	10,694	8.9	14.9	8.8	422
Irrigation Only	2,349	4.5	5,655	4.7	7.9	4.6	153
* Includes the value of the Outside Commercial Service.							

2.6 FORECAST OF FUTURE WATER DEMAND

Water use is contingent upon a number of varying and uncertain factors, which makes forecasting future demand difficult. Of primary importance are the following factors:

1. Population;
2. Type of residential development, i.e., single-family, multi-family, rural, large or small lot;
3. Per capita income;
4. Types of commercial and industrial enterprises;
5. Climate;
6. Irrigation use of water; and
7. Price charged for water and type of rate structure, i.e., whether individual service meters are used and, if so, the base water quantity and cost.

Table 2-22 identified the water service consumption ERU factors by user category, for annual average day, peak day, and peak hour demand. Forecasting future system demand is based upon the projected number of single-family residential, outside single-family residential, multi-family residential, commercial, large industrial, industrial, government, and irrigation only water services, and the annual average day, peak day, and peak hour water demands.

Future residential services are based upon the projected population within the City and the UGA. However, based upon impacts to Selah's existing water rights and reservoir storage capacity, the City Council has determined the City will only provide water service to new customers within their UGA under specific conditions (previously specified within this Plan).

It is unlikely that all of this future population will be served by Selah's water system within the next twenty year period. For this Plan, it is assumed that all of the future City population will be served by the City's water system in the year 2027, but only a limited portion of the future UGA population will be served by the City's water system.

Because Selah is in many ways a bedroom community to the City of Yakima, increases in commercial businesses do not necessarily correlate to increases in population. Therefore, it is difficult to predict how population increases within the City and the UGA will affect increases in commercial establishments. For the purposes of this forecast, the residential, commercial, industrial, and government water services are projected to be as shown on Table 2-23.

TABLE 2-23 FUTURE WATER SERVICES AND EQUIVALENT RESIDENTIAL UNITS

	2013		2017		2027	
	Services	ERUs*	Services	ERUs*	Services	ERUs*
Single-Family Residential	2,427	2,427	2,697	2,697	3,370	3,370
Outside Single-Family Residential	38	38	38	38	38	38
Multi-Family Residential	57	188	63	208	79	261
Commercial	162	194	177	212	214	257
Outside Commercial	1	1	1	1	1	1
Large Industrial	2	1,254	3	1,881	3	1,881
Industrial	6	146	7	170	8	194
Government	50	515	54	556	66	680
Irrigation Only	41	185	45	203	54	243
TOTAL SERVICES	2,784	4,948	3,085	5,966	3,833	6,925

* ERUs based on average annual water demand for the period 2001 - 2005 as shown on Table 2-21.

Other factors such as income, climate and water cost will be assumed to remain consistent with current trends. Climate does have a major influence on Selah's water consumption because of the use of domestic water supply for irrigation purposes. However, the area's climate has remained reasonably consistent with historical averages.

Table 2-24 provides the future water demand forecast for the City of Selah by the year 2013, Table 2-25 provides the future water demand forecast for the City of Selah by the year 2017, and Table 2-26 provides the future water demand forecast for the City of Selah by the year 2027. To accommodate the uncertainties in projecting future water demand and non-revenue water, an additional 10% contingency factor has been applied to these projections.

TABLE 2-24 FUTURE WATER DEMAND FORECAST FOR YEAR 2013

Type of Service	Number of Services	Annual Demand (MG)	Maximum Day Demand (MGD)	Peak Hour Demand (GPM)
Single-Family Residential	2,427	465.074	2.907	4,126
Outside Single-Family Residential	38	7.615	0.048	68
Multi Family Residential	57	36.367	0.166	234
Commercial	162	38.494	0.185	259
Outside Commercial	1	0.237	0.001	2
Large Industrial	2	240.256	0.512	711
Industrial	6	27.990	0.091	126
Government	50	98.641	0.535	745
Irrigation	41	35.153	0.232	324
Subtotal	2,784	949.827	4.677	6,594
10% Contingency		94.983	0.468	659
TOTAL	2,784	1,044.810	5.145	7,254

TABLE 2-25 FUTURE WATER DEMAND FORECAST FOR YEAR 2017				
Type of Service	Number of Services	Annual Demand (MG)	Maximum Day Demand (MGD)	Peak Hour Demand (GPM)
Single-Family Residential	2,697	516.813	3.231	4,585
Outside Single-Family Residential	38	7.615	0.048	68
Multi Family Residential	63	40.195	0.184	258
Commercial	177	42.058	0.202	283
Outside Commercial	1	0.237	0.001	2
Large Industrial	3	360.384	0.767	1,066
Industrial	7	32.655	0.106	147
Government	54	106.533	0.577	805
Irrigation	45	38.582	0.254	356
Subtotal	3,085	1,145.073	5.371	7,569
10% Contingency		114.507	0.537	757
TOTAL	3,085	1,259.580	5.908	8,326

TABLE 2-26 FUTURE WATER DEMAND FORECAST FOR YEAR 2027				
Type of Service	Number of Services	Annual Demand (MG)	Maximum Day Demand (MGD)	Peak Hour Demand (GPM)
Single-Family Residential	3,370	645.776	4.037	5,729
Outside Single-Family Residential	38	7.615	0.048	68
Multi Family Residential	79	50.404	0.231	324
Commercial	214	50.850	0.244	342
Outside Commercial	1	0.237	0.001	2
Large Industrial	3	360.384	0.767	1,066
Industrial	8	37.321	0.121	168
Government	66	130.206	0.706	983
Irrigation	54	46.299	0.306	427
Subtotal	3,833	1,329.092	6.461	9,109
10% Contingency		132.909	0.646	911
TOTAL	3,833	1,462.001	7.107	10,020

Table 2-27 summarizes the current and future 6-year and 20-year water rights source capacity, together with water demands for the City of Selah. Table 2-27A summarizes the systems capacity, in ERUs, based on current water right, source and storage capacity. Projected system demand and calculated system capacity of other tables in this Plan are based on demand per service and do not directly correlate to the calculated demand per ERU for all service categories under different demand conditions (e.g. ADD, MDD, PHD). The values of Table 2-27A are therefore, only estimates based upon calculated demands per ERU for ADD, MDD, and PHD from historical source and supply meter records. Further system analysis will have to be performed to determine the system's available capacity with regard to proposed development type (i.e. type of service category) to account for variations in average and peak demands of individual service categories.

TABLE 2-27 CURRENT AND FUTURE WATER RIGHTS, SOURCE CAPACITY, AND WATER DEMAND SUMMARY										
Year	System Water Demand					Existing Source Capacity		Existing Water Rights		
	# of ERUs[a]	Total Annual Demand	ADD	MDD	PHD	Maximum Daily Capacity	Pumping Capacity	Water Rights Qi		Water Rights Qa
		MG/Year	MGD	MGD	GPM	MGD	GPM	GPM	MGD	MG/Year
2005	4,219	729.485[b]	1.999[b]	3.820[c]	5,306[c]	7.632	5,300	5,500	7.920	1,550.945
2013	4,948	1,044.810	2.862	5.145	7,254	7.920[d]	5,500[d]	5,500	7.920	1,550.945
2017	5,966	1,259.580	3.450	5.908	8,326	7.920[d]	5,500[d]	5,500	7.920	1,550.945
2027	6,925	1,462.001	4.005	7.107	10,020	7.920[d]	5,500[d]	5,500	7.920	1,550.945

a Based on the average annual 2001 - 2005 ERU values shown on Table 2-22.
b Existing total annual demand and ADD are based on Year 2005 consumption values of Table 2-16.
c Existing MDD and PHD quantities are based on maximum month consumption experienced in July 2004 (Table 2-18).
d Assumes construction of a new source well (Well No. 8) with a capacity 2,000 GPM by the year 2013, to maximize current instantaneous water right capacity.

TABLE 2-27A SUMMARY OF SYSTEM ERU CAPACITY					
System Component	Current Capacity	Future Capacity	Demand/ERU	Total ERU Capacity[a]	Available ERU Capacity[a]
Water Rights	5,500 GPM/4,760 acre-feet	Unknown	0.83 GPM / 0.59 acre-feet[b]	6,627 / 8,068	2,408 / 3,849
Source Capacity	5,300 GPM	5,500 GPM	0.83 GPM[b]	6,627	2,408
Storage Capacity[c]	3.414 MG	3.731 MG	288 gallons[d]	11,122	6,903

[a] Based on future system capacities with recommended system improvements in place.
[b] Instantaneous demand based on maximum day demand per ERU and annual demand is based on average day demand per ERU.
[c] Reservoir storage ERU capacity is based upon the total system storage requirements and does not account for individual pressure zone requirements.
[d] Storage capacity per ERU was calculated based on a operational and standby requirement of 220 gallons per ERU (assuming that source of supply minus the largest source will always exceed the minimum DOH standby storage requirement) plus an equalizing storage volume of 68 gallons per ERU. The equalizing storage per ERU is based on the 2027 volume per ERU (highest difference between PHD and source capacity) because equalizing storage per ERU is not a linear change with system growth. The gallons per ERU quantity excludes fire suppression storage, which remains constant.

Water Rates and Impacts on Water Demand

Water service charges are set by ordinance of the City Council. The current water service charges were last adopted in December 2006. A copy of the current water service charges (City Ordinance 1075) is included in the Miscellaneous Documents Chapter (Chapter 10) of this Plan.

Current and Future Water Demand by Pressure Zone

In addition to forecasting future total water demand, it is important to forecast where in the system that demand will occur. The current water services and water demand by pressure zone is presented in Table 2-28. The current numbers of services in Table 2-28 are based upon the 2005 number of services in each pressure zone, but the demand per service is based upon the ADD, MDD, and PHD values established for future projections, and does not reflect the actual 2005 consumption. The future water services and water demand by pressure zone for the years 2013, 2017, and 2027 are presented in Table 2-29, Table 2-30, and Table 2-31. The values in Tables 2-28, 2-29, 2-30, and 2-31 include a 10% contingency factor to account for system losses, as shown in the respective tables.

TABLE 2-28 CURRENT WATER DEMAND BY PRESSURE ZONE

Single-Family Residential Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	942	615	311	52	0	0	0	1,920
Annual Demand (gal/year)	180,510,750	117,849,375	59,595,375	9,964,500	0	0	0	367,920,000
Maximum Day Demand (gal/day)	1,128,516	736,770	372,578	62,296	0	0	0	2,300,160
Peak Hour Demand (gpm)	1,601	1,046	529	88	0	0	0	3,264
Outside Single-Family Residential Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	19	12	6	1	0	0	0	38
Annual Demand (gal/year)	3,807,315	2,404,620	1,202,310	200,385	0	0	0	7,614,630
Maximum Day Demand (gal/day)	24,206	15,288	7,644	1,274	0	0	0	48,412
Peak Hour Demand (gpm)	34	22	11	2	0	0	0	68
Multi-Family Residential Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	42	2	0	1	0	0	0	45
Annual Demand (gal/year)	26,796,840	1,276,040	0	638,020	0	0	0	28,710,900
Maximum Day Demand (gal/day)	122,556	5,836	0	2,918	0	0	0	131,310
Peak Hour Demand (gpm)	172	8	0	4	0	0	0	185
Commercial Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	132	0	1	0	0	0	0	133
Annual Demand (gal/year)	31,365,180	0	237,615	0	0	0	0	31,554,250
Maximum Day Demand (gal/day)	150,348	0	1,139	0	0	0	0	151,487
Peak Hour Demand (gpm)	211	0	2	0	0	0	0	213
Outside Commercial Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	1	0	0	0	0	0	0	1
Annual Demand (gal/year)	237,615	0	0	0	0	0	0	237,615
Maximum Day Demand (gal/day)	1,139	0	0	0	0	0	0	1,139
Peak Hour Demand (gpm)	2	0	0	0	0	0	0	2
Large Industrial Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	2	0	0	0	0	0	0	2
Annual Demand (gal/year)	240,256,140	0	0	0	0	0	0	240,256,140
Maximum Day Demand (gal/day)	511,648	0	0	0	0	0	0	511,648
Peak Hour Demand (gpm)	711	0	0	0	0	0	0	711
Industrial Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	5	0	0	0	0	0	0	5
Annual Demand (gal/year)	23,325,325	0	0	0	0	0	0	23,325,325
Maximum Day Demand (gal/day)	75,635	0	0	0	0	0	0	75,635
Peak Hour Demand (gpm)	105	0	0	0	0	0	0	105
Government Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	28	0	13	0	0	0	0	41
Annual Demand (gal/year)	55,239,100	0	25,646,725	0	0	0	0	80,885,825
Maximum Day Demand (gal/day)	299,432	0	139,022	0	0	0	0	438,454
Peak Hour Demand (gpm)	417	0	194	0	0	0	0	611
Irrigation Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	23	6	4	1	0	0	0	34
Annual Demand (gal/year)	19,719,855	5,144,310	3,429,540	857,385	0	0	0	29,151,090
Maximum Day Demand (gal/day)	130,065	33,930	22,620	5,655	0	0	0	192,270
Peak Hour Demand (gpm)	182	47	32	8	0	0	0	269
SUBTOTAL SERVICES BY ZONE	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	1,194	635	335	55	0	0	0	2,219
Annual Demand (gal/year)	581,258,120	126,674,345	90,111,565	11,660,290	0	0	0	809,655,775
Maximum Day Demand (gal/day)	2,443,545	791,824	543,003	72,143	0	0	0	3,850,515
Peak Hour Demand (gpm)	3,435	1,123	766	102	0	0	0	5,427
10% CONTINGENCY	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	1,194	635	335	55	0	0	0	2,219
Annual Demand (gal/year)	58,125,812	12,667,435	9,011,157	1,166,029	0	0	0	80,965,578
Maximum Day Demand (gal/day)	244,355	79,182	54,300	7,214	0	0	0	385,052
Peak Hour Demand (gpm)	344	112	77	10	0	0	0	543
TOTAL SERVICES BY ZONE	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	1,194	635	335	55	0	0	0	2,219
Annual Demand (gal/year)	639,383,932	139,341,780	99,122,722	12,826,319	0	0	0	890,621,353
Maximum Day Demand (gal/day)	2,687,900	871,006	597,303	79,357	0	0	0	4,235,567
Peak Hour Demand (gpm)	3,779	1,235	843	112	0	0	0	5,969

TABLE 2-29 YEAR 2013 FUTURE WATER DEMAND BY PRESSURE ZONE

Single-Family Residential Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	942	615	351	255	30	40	194	2,427
Annual Demand (gal/year)	180,510,750	117,849,375	67,260,375	48,864,375	5,748,750	7,665,000	37,175,250	465,073,875
Maximum Day Demand (gal/day)	1,128,516	736,770	420,498	305,490	35,940	47,920	232,412	2,907,546
Peak Hour Demand (gpm)	1,601	1,046	597	434	51	68	330	4,126
Outside Single-Family Residential Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	19	12	6	1	0	0	0	38
Annual Demand (gal/year)	3,807,315	2,404,620	1,202,310	200,385	0	0	0	7,614,630
Maximum Day Demand (gal/day)	24,206	15,288	7,644	1,274	0	0	0	48,412
Peak Hour Demand (gpm)	34	22	11	2	0	0	0	68
Multi-Family Residential Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	42	8	6	1	0	0	0	57
Annual Demand (gal/year)	26,796,840	5,104,160	3,828,120	638,020	0	0	0	36,367,140
Maximum Day Demand (gal/day)	122,556	23,344	17,508	2,918	0	0	0	166,326
Peak Hour Demand (gpm)	172	33	25	4	0	0	0	234
Commercial Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	159	0	1	0	0	0	2	162
Annual Demand (gal/year)	37,780,785	0	237,615	0	0	0	475,230	38,493,630
Maximum Day Demand (gal/day)	181,101	0	1,139	0	0	0	2,278	184,518
Peak Hour Demand (gpm)	254	0	2	0	0	0	3	259
Outside Commercial Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	1	0	0	0	0	0	0	1
Annual Demand (gal/year)	237,615	0	0	0	0	0	0	237,615
Maximum Day Demand (gal/day)	1,139	0	0	0	0	0	0	1,139
Peak Hour Demand (gpm)	2	0	0	0	0	0	0	2
Large Industrial Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	2	0	0	0	0	0	0	2
Annual Demand (gal/year)	240,256,140	0	0	0	0	0	0	240,256,140
Maximum Day Demand (gal/day)	511,648	0	0	0	0	0	0	511,648
Peak Hour Demand (gpm)	711	0	0	0	0	0	0	711
Industrial Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	6	0	0	0	0	0	0	6
Annual Demand (gal/year)	27,990,390	0	0	0	0	0	0	27,990,390
Maximum Day Demand (gal/day)	90,762	0	0	0	0	0	0	90,762
Peak Hour Demand (gpm)	126	0	0	0	0	0	0	126
Government Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	30	0	16	0	0	0	4	50
Annual Demand (gal/year)	59,184,750	0	31,565,200	0	0	0	7,891,300	98,641,250
Maximum Day Demand (gal/day)	320,820	0	171,104	0	0	0	42,776	534,700
Peak Hour Demand (gpm)	447	0	238	0	0	0	60	745
Irrigation Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	23	6	4	1	0	0	7	41
Annual Demand (gal/year)	19,719,855	5,144,310	3,429,540	857,385	0	0	6,001,695	35,152,785
Maximum Day Demand (gal/day)	130,065	33,930	22,620	5,655	0	0	39,585	231,855
Peak Hour Demand (gpm)	182	47	32	8	0	0	55	324
SUBTOTAL SERVICES BY ZONE	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	1,224	641	384	258	30	40	207	2,784
Annual Demand (gal/year)	596,284,440	130,502,465	107,523,160	50,560,165	5,748,750	7,665,000	51,543,475	949,827,455
Maximum Day Demand (gal/day)	2,510,813	809,332	640,513	315,337	35,940	47,920	317,051	4,676,906
Peak Hour Demand (gpm)	3,529	1,147	904	447	51	68	448	6,594
10% CONTINGENCY	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	1,224	641	384	258	30	40	207	2,784
Annual Demand (gal/year)	59,628,444	13,050,247	10,752,316	5,056,017	574,875	766,500	5,154,348	94,982,746
Maximum Day Demand (gal/day)	251,081	80,933	64,051	31,534	3,594	4,792	31,705	467,691
Peak Hour Demand (gpm)	353	115	90	45	5	7	45	659
TOTAL SERVICES BY ZONE	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	1,224	641	384	258	30	40	207	2,784
Annual Demand (gal/year)	655,912,884	143,552,712	118,275,476	55,616,182	6,323,625	8,431,500	56,697,823	1,044,810,201
Maximum Day Demand (gal/day)	2,761,894	890,265	704,564	346,871	39,534	52,712	348,756	5,144,597
Peak Hour Demand (gpm)	3,882	1,262	994	492	56	75	493	7,254

TABLE 2-30 YEAR 2017 FUTURE WATER DEMAND BY PRESSURE ZONE

Single-Family Residential Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	942	665	421	305	30	40	294	2,697
Annual Demand (gal/year)	180,510,750	127,430,625	80,674,125	58,445,625	5,748,750	7,665,000	56,337,750	516,812,625
Maximum Day Demand (gal/day)	1,128,516	796,670	504,358	365,390	35,940	47,920	352,212	3,231,006
Peak Hour Demand (gpm)	1,601	1,131	716	519	51	68	500	4,585
Outside Single-Family Residential Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	19	12	6	1	0	0	0	38
Annual Demand (gal/year)	3,807,315	2,404,620	1,202,310	200,385	0	0	0	7,614,630
Maximum Day Demand (gal/day)	24,206	15,288	7,644	1,274	0	0	0	48,412
Peak Hour Demand (gpm)	34	22	11	2	0	0	0	68
Multi-Family Residential Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	42	8	9	4	0	0	0	63
Annual Demand (gal/year)	26,796,840	5,104,160	5,742,180	2,552,080	0	0	0	40,195,260
Maximum Day Demand (gal/day)	122,556	23,344	26,262	11,672	0	0	0	183,834
Peak Hour Demand (gpm)	172	33	37	16	0	0	0	258
Commercial Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	174	0	1	0	0	0	2	177
Annual Demand (gal/year)	41,345,010	0	237,615	0	0	0	475,230	42,057,855
Maximum Day Demand (gal/day)	198,186	0	1,139	0	0	0	2,278	201,603
Peak Hour Demand (gpm)	278	0	2	0	0	0	3	283
Outside Commercial Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	1	0	0	0	0	0	0	1
Annual Demand (gal/year)	237,615	0	0	0	0	0	0	237,615
Maximum Day Demand (gal/day)	1,139	0	0	0	0	0	0	1,139
Peak Hour Demand (gpm)	2	0	0	0	0	0	0	2
Large Industrial Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	3	0	0	0	0	0	0	3
Annual Demand (gal/year)	360,384,210	0	0	0	0	0	0	360,384,210
Maximum Day Demand (gal/day)	767,472	0	0	0	0	0	0	767,472
Peak Hour Demand (gpm)	1,066	0	0	0	0	0	0	1,066
Industrial Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	7	0	0	0	0	0	0	7
Annual Demand (gal/year)	32,655,455	0	0	0	0	0	0	32,655,455
Maximum Day Demand (gal/day)	105,889	0	0	0	0	0	0	105,889
Peak Hour Demand (gpm)	147	0	0	0	0	0	0	147
Government Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	30	0	16	4	0	0	4	54
Annual Demand (gal/year)	59,184,750	0	31,565,200	7,891,300	0	0	7,891,300	106,532,550
Maximum Day Demand (gal/day)	320,820	0	171,104	42,776	0	0	42,776	577,476
Peak Hour Demand (gpm)	447	0	238	60	0	0	60	805
Irrigation Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	23	6	6	3	0	0	7	45
Annual Demand (gal/year)	19,719,855	5,144,310	5,144,310	2,572,155	0	0	6,001,695	38,582,325
Maximum Day Demand (gal/day)	130,065	33,930	33,930	16,965	0	0	39,585	254,475
Peak Hour Demand (gpm)	182	47	47	24	0	0	55	356
SUBTOTAL SERVICES BY ZONE	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	1,241	691	459	317	30	40	307	3,085
Annual Demand (gal/year)	724,641,800	140,083,715	124,565,740	71,661,545	5,748,750	7,665,000	70,705,975	1,145,072,525
Maximum Day Demand (gal/day)	2,798,849	869,232	744,437	438,077	35,940	47,920	436,851	5,371,306
Peak Hour Demand (gpm)	3,929	1,232	1,051	620	51	68	618	7,569
10% CONTINGENCY	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	1,241	691	459	317	30	40	307	3,085
Annual Demand (gal/year)	72,464,180	14,008,372	12,456,574	7,166,155	574,875	766,500	7,070,598	114,507,253
Maximum Day Demand (gal/day)	279,885	86,923	74,444	43,808	3,594	4,792	43,685	537,131
Peak Hour Demand (gpm)	393	123	105	62	5	7	62	757
TOTAL SERVICES BY ZONE	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	1,241	691	459	317	30	40	307	3,085
Annual Demand (gal/year)	797,105,980	154,092,087	137,022,314	78,827,700	6,323,625	8,431,500	77,776,573	1,259,579,778
Maximum Day Demand (gal/day)	3,078,734	956,155	818,881	481,885	39,534	52,712	480,536	5,908,437
Peak Hour Demand (gpm)	4,322	1,356	1,156	682	56	75	680	8,326

TABLE 2-31 YEAR 2027 FUTURE WATER DEMAND BY PRESSURE ZONE

Single-Family Residential Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	942	715	521	405	30	110	647	3,370
Annual Demand (gal/year)	180,510,750	137,011,875	99,836,625	77,608,125	5,748,750	21,078,750	123,981,375	645,776,250
Maximum Day Demand (gal/day)	1,128,516	856,570	624,158	485,190	35,940	131,780	775,106	4,037,260
Peak Hour Demand (gpm)	1,601	1,216	886	689	51	187	1,100	5,729

Outside Single-Family Residential Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	19	12	6	1	0	0	0	38
Annual Demand (gal/year)	3,807,315	2,404,620	1,202,310	200,385	0	0	0	7,614,630
Maximum Day Demand (gal/day)	24,206	15,288	7,644	1,274	0	0	0	48,412
Peak Hour Demand (gpm)	34	22	11	2	0	0	0	68

Multi-Family Residential Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	42	12	12	7	3	3	0	79
Annual Demand (gal/year)	26,796,840	7,656,240	7,656,240	4,466,140	1,914,060	1,914,060	0	50,403,580
Maximum Day Demand (gal/day)	122,556	35,016	35,016	20,426	8,754	8,754	0	230,522
Peak Hour Demand (gpm)	172	49	49	29	12	12	0	324

Commercial Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	211	0	1	0	0	0	2	214
Annual Demand (gal/year)	50,136,765	0	237,615	0	0	0	475,230	50,849,610
Maximum Day Demand (gal/day)	240,329	0	1,139	0	0	0	2,278	243,746
Peak Hour Demand (gpm)	338	0	2	0	0	0	3	342

Outside Commercial Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	1	0	0	0	0	0	0	1
Annual Demand (gal/year)	237,615	0	0	0	0	0	0	237,615
Maximum Day Demand (gal/day)	1,139	0	0	0	0	0	0	1,139
Peak Hour Demand (gpm)	2	0	0	0	0	0	0	2

Large Industrial Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	3	0	0	0	0	0	0	3
Annual Demand (gal/year)	360,384,210	0	0	0	0	0	0	360,384,210
Maximum Day Demand (gal/day)	767,472	0	0	0	0	0	0	767,472
Peak Hour Demand (gpm)	1,066	0	0	0	0	0	0	1,066

Industrial Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	8	0	0	0	0	0	0	8
Annual Demand (gal/year)	37,320,520	0	0	0	0	0	0	37,320,520
Maximum Day Demand (gal/day)	121,016	0	0	0	0	0	0	121,016
Peak Hour Demand (gpm)	168	0	0	0	0	0	0	168

Government Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	32	0	16	7	0	5	6	66
Annual Demand (gal/year)	63,130,400	0	31,565,200	13,809,775	0	9,864,125	11,836,950	130,206,450
Maximum Day Demand (gal/day)	342,208	0	171,104	74,858	0	53,470	64,164	705,804
Peak Hour Demand (gpm)	477	0	238	104	0	75	89	983

Irrigation Services	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	23	6	8	4	1	2	10	54
Annual Demand (gal/year)	19,719,855	5,144,310	6,859,080	3,429,540	857,385	1,714,770	8,573,850	46,298,790
Maximum Day Demand (gal/day)	130,065	33,930	45,240	22,620	5,655	11,310	56,550	305,370
Peak Hour Demand (gpm)	182	47	63	32	8	16	79	427

SUBTOTAL SERVICES BY ZONE	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	1,281	745	564	424	34	120	665	3,833
Annual Demand (gal/year)	742,044,270	152,217,045	147,357,070	99,513,965	8,520,195	34,571,705	144,867,405	1,329,091,655
Maximum Day Demand (gal/day)	2,877,507	940,804	884,301	604,368	50,349	205,314	898,098	6,460,741
Peak Hour Demand (gpm)	4,039	1,334	1,249	855	71	290	1,272	9,109

10% CONTINGENCY	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	1,281	745	564	424	34	120	665	3,833
Annual Demand (gal/year)	74,204,427	15,221,705	14,735,707	9,951,397	852,020	3,457,171	14,486,741	132,909,166
Maximum Day Demand (gal/day)	287,751	94,080	88,430	60,437	5,035	20,531	89,810	646,074
Peak Hour Demand (gpm)	404	133	125	85	7	29	127	911

TOTAL SERVICES BY ZONE	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	TOTAL
Number of Services	1,281	745	564	424	34	120	665	3,833
Annual Demand (gal/year)	816,248,697	167,438,750	162,092,777	109,465,362	9,372,215	38,028,876	159,354,146	1,462,000,821
Maximum Day Demand (gal/day)	3,165,258	1,034,884	972,731	664,805	55,384	225,845	987,908	7,106,815
Peak Hour Demand (gpm)	4,443	1,467	1,374	940	78	319	1,399	10,020