

## Results and Analysis

The Spokane County Water Demand Forecast Model was used to conduct the following analyses:

1. Current and projected total water demand by sector for the entire county.
2. Current and projected total and monthly water demand for areas served by water from the SVRP Aquifer.
3. Current and projected total water demand by sector for each WRIA within Spokane County.
4. Increase in self supplied water use from 2010 to 2040 for each rural sub basin.
5. Impact of weather and conservation on current and projected demand.

As described in previous sections of this report, the forecast is based on the *SRTC 2030 Growth Forecasts for Employment, Housing, and Transportation* (Intermountain Demographics, 2006).

The agricultural and self supplied industrial sectors are projected to have no growth in this forecast. In the model these sectors are self supplied and require water rights. Given that approval of new water rights in Spokane County is unlikely, no growth is forecasted. The model, though, can include growth in these sectors.

### Spokane County Total Water Demand

Table 12 and Figure 15 present the total projected annual water demand for each water use sector in five year increments.

**Table 12 – Spokane County Water Demand Forecast by Sector**

| Year | Public Supply | Self Supply Residential | Self Supply Industrial | Agricultural | Total |
|------|---------------|-------------------------|------------------------|--------------|-------|
| 2010 | 52.27         | 5.46                    | 7.17                   | 10.53        | 75.83 |
| 2015 | 55.28         | 5.75                    | 7.17                   | 10.53        | 78.73 |
| 2020 | 59.17         | 6.20                    | 7.17                   | 10.53        | 83.07 |
| 2025 | 62.62         | 6.65                    | 7.17                   | 10.53        | 86.98 |
| 2030 | 66.28         | 7.10                    | 7.17                   | 10.53        | 91.08 |
| 2035 | 69.94         | 7.55                    | 7.17                   | 10.53        | 95.19 |
| 2040 | 73.59         | 8.00                    | 7.17                   | 10.53        | 99.30 |

All values reported in billions of gallons per year

Growth in the public supply sector over the 30 year forecast is 41% and in the self supply residential sector is 47%. While not growing as quickly as self supplied residential public supply is the largest component of total water demand. Figure 15 shows the public supply forecast segregated by sub sector.

### SVRP Aquifer Water Demand

The main source of water for Spokane County is the SVRP aquifer. This resource is utilized both within and outside of the geographic boundaries of the aquifer. Figure 14 shows the aquifer boundary and the approximate area served by water from the aquifer within Spokane County.

**Figure 14: Approximate Area Served by SVRP Aquifer**

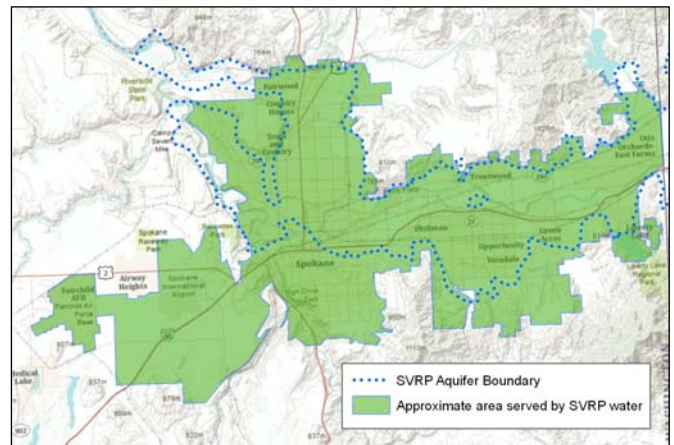


Table 13 and Figure 17 present the total water demand for the SVRP Aquifer in five year increments from 2010 to 2040. Included in this figure are demand projections for the portion of the aquifer within Idaho. The Idaho water demand projections were included because the aquifer is a multi state resource. The demand projections for Idaho were taken from the *Rathdrum Prairie Aquifer Water Demand Projections (SPF Water Engineering, 2010)* report prepared for the Idaho Water Resource Board.

Figure 15 –Total Annual Water Demand 2010-2040

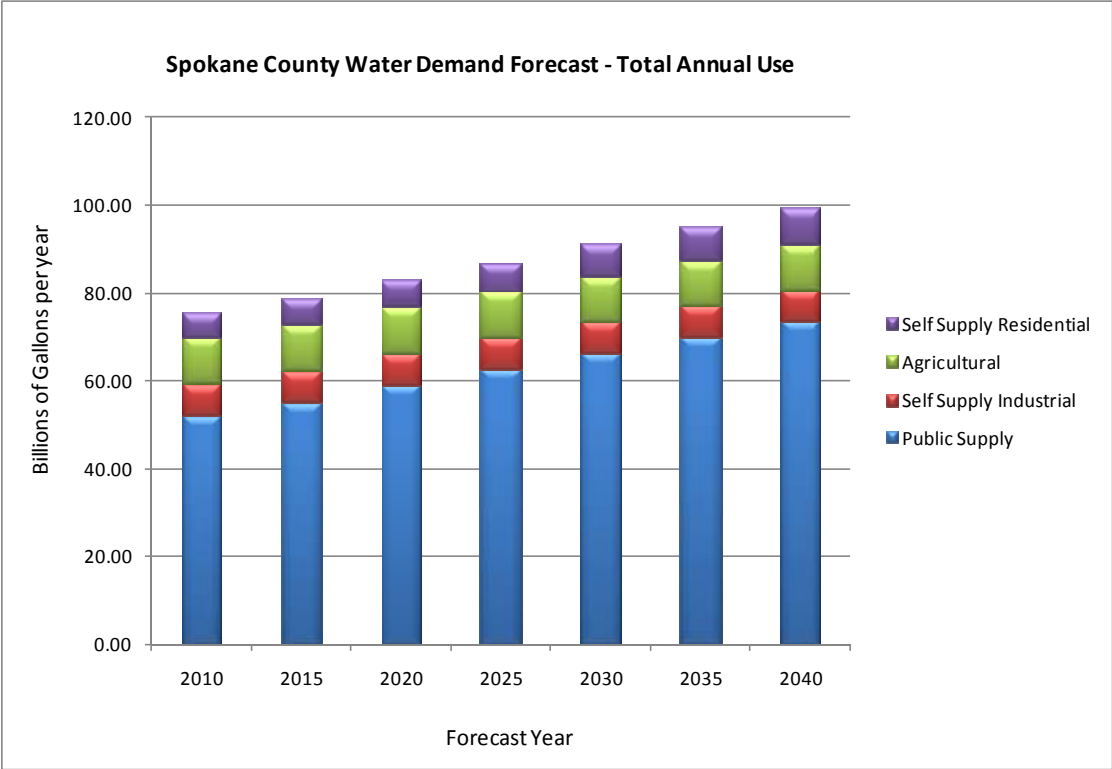
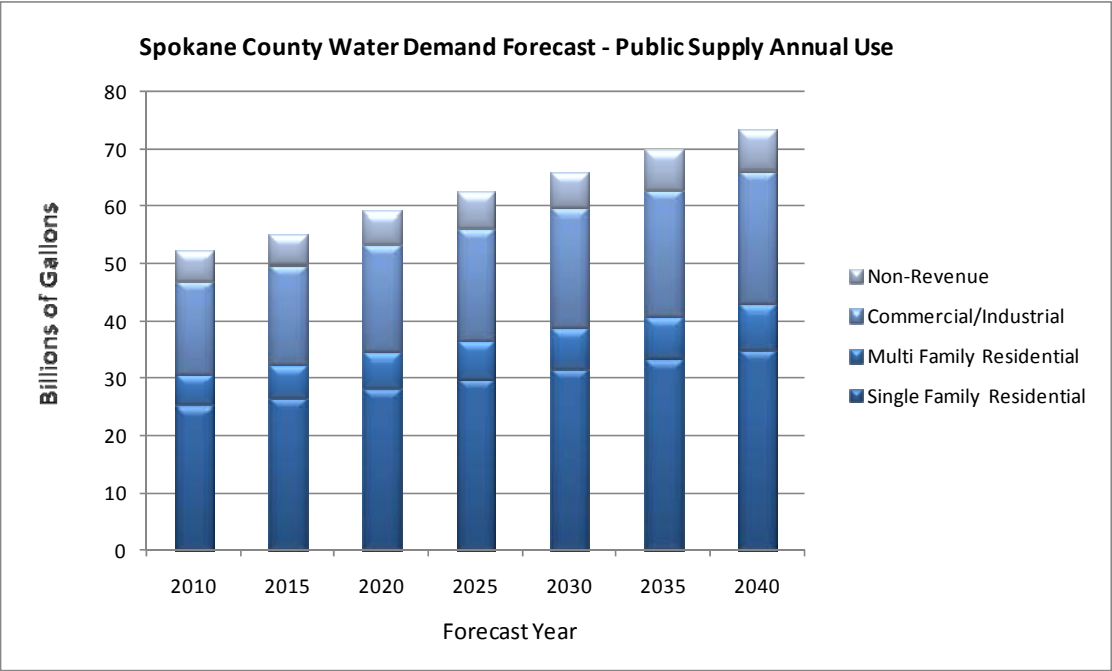


Figure 16 –Public Supply Water Demand 2010-2040



**Table 13 – SVRP Aquifer Demand Forecast**

| Year     | Washington | Idaho | Total  |
|----------|------------|-------|--------|
| 2010     | 53.86      | 24.24 | 77.75  |
| 2015     | 56.44      | 25.71 | 81.76  |
| 2020     | 59.70      | 27.66 | 86.95  |
| 2025     | 62.63      | 29.85 | 92.02  |
| 2030     | 65.71      | 32.23 | 97.45  |
| 2035     | 68.79      | 34.90 | 103.17 |
| 2040     | 71.87      | 38.16 | 109.48 |
| Change   | 18.01      | 13.92 | 31.93  |
| % Growth | 33%        | 57%   | 41%    |

All values reported in billions of gallons per year

Absolute growth in water demand in Washington is greater while the rate of growth in Idaho is greater which is consistent with recent growth trends.

### SVRP Aquifer Water Demand by Month

It is well documented that the SVRP aquifer is connected to the Spokane River, and the *Ground-Water Flow Model for the Spokane Valley-Rathdrum Prairie Aquifer (USGS, 2007)* demonstrated that withdrawals from the aquifer have an impact on river flows within a very short time frame. This is particularly important during the summer months when demand is high and river flow is low. Table 14 and Figure 18 present the monthly water demand from the SVRP aquifer for 2010 and 2040.

**Table 14 – SVRP Aquifer Monthly Demand**

| Year      | 2010 | 2040 | Change |
|-----------|------|------|--------|
| January   | 105  | 137  | 32     |
| February  | 105  | 137  | 32     |
| March     | 105  | 137  | 32     |
| April     | 106  | 138  | 32     |
| May       | 249  | 334  | 85     |
| June      | 346  | 462  | 116    |
| July      | 459  | 613  | 153    |
| August    | 454  | 610  | 156    |
| September | 373  | 502  | 130    |
| October   | 223  | 305  | 81     |
| November  | 105  | 137  | 32     |
| December  | 105  | 137  | 32     |

All values reported in cubic feet per second

The seven day low flow\* for the Spokane River as measured at the USGS Spokane River at Spokane, WA gage has ranged from 507 to 1594 CFS in the last 20 years. The increase in demand from the SVRP aquifer in Washington is projected to increase 156 CFS, a range of 10% to 30% of the seven day low flow. During low flow years, which often coincide with high outdoor water use, the increase in demand will make a significant impact on river flow. Also, the demand is reported as a monthly average, not a peak withdrawal. The daily peak withdrawal from the SVRP aquifer will be in excess of 156 CFS.

### Water Demand by WRIA

Approximately 29% of Spokane County current water demand is supplied by water not withdrawn from the SVRP aquifer. Table 15 and Figures 20-23 present the water demand for each Water Resource Inventory Area (WRIA) within Spokane County. Figure 19 shows the boundaries of each WRIA.

The current and projected demand presented for each WRIA in Table 15 represents demand that is supplied by water from within the WRIA, and not connected with the SVRP aquifer and is limited to Spokane County.

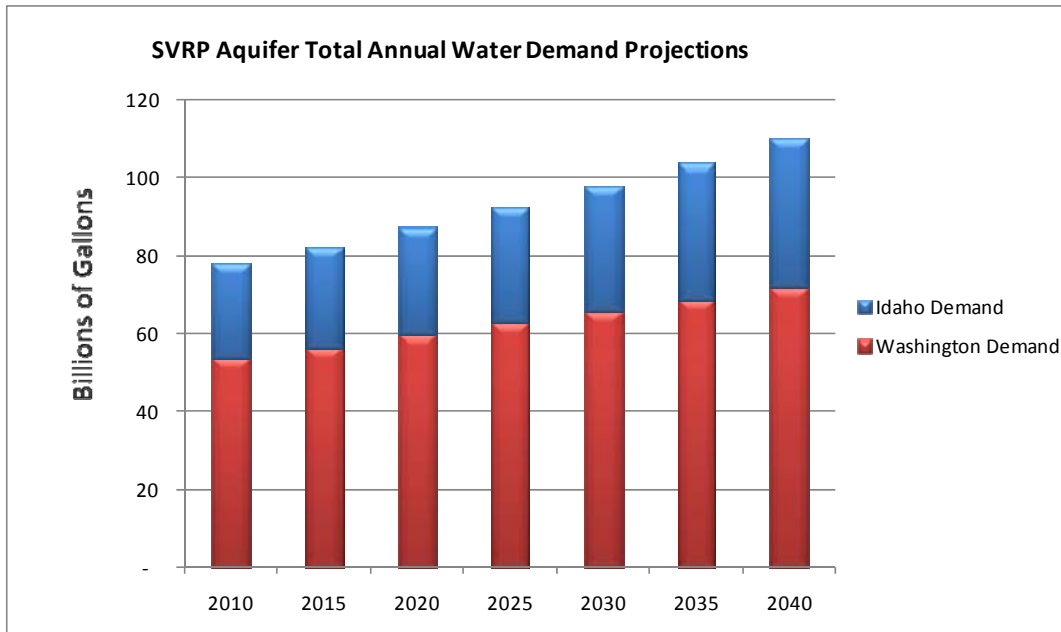
**Table 15 – Water Demand Forecast by WRIA**

| Year     | WRIA    |      |      |      |
|----------|---------|------|------|------|
|          | 34 & 43 | 54   | 55   | 56   |
| 2010     | 2.24    | 5.00 | 7.27 | 3.13 |
| 2015     | 2.31    | 5.12 | 7.46 | 3.29 |
| 2020     | 2.42    | 5.28 | 7.82 | 3.45 |
| 2025     | 2.51    | 5.42 | 8.12 | 3.65 |
| 2030     | 2.61    | 5.57 | 8.45 | 3.83 |
| 2035     | 2.71    | 5.73 | 8.79 | 4.01 |
| 2040     | 2.82    | 5.88 | 9.12 | 4.20 |
| Change   | 0.58    | 0.88 | 1.85 | 1.07 |
| % Growth | 26%     | 18%  | 25%  | 34%  |

All values reported in billions of gallons per year

\*Seven Day Low Flow - A measurement of low stream flow conditions calculated as the lowest average flow over seven consecutive days.

**Figure 17 – SVRP Aquifer Water Demand 2010-2040**



**Figure 18 – SVRP Aquifer Monthly Water Demand**

