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## List of Abbreviations and Acronyms

<b>2016-2035 WRP</b>	TMWA's 2016-2035 Water Resource Plan
<b>ADAF</b>	Average Day Annual Flows
<b>af</b>	Acre-Feet
<b>afa</b>	Acre Feet Annually
<b>CSWRF</b>	Cold Springs Water Reclamation Facility
<b>FSA</b>	Future Service Areas
<b>GMWS</b>	General Metered Water Service
<b>GPD</b>	Gallons Per Day
<b>M&amp;I</b>	Municipal and Industrial
<b>MGD</b>	Million Gallons Per Day
<b>MMWS</b>	Multiple-Unit Residential Metered Service
<b>NNWPC</b>	Northern Nevada Water Planning Commission
<b>PEM</b>	Population and Employment Model
<b>Regional Plan</b>	Truckee Meadows Regional Plan
<b>RMWS</b>	Residential Metered Service
<b>RPGB</b>	Regional Planning Governing Board
<b>RSWRF</b>	Reno Stead Water Reclamation Facility
<b>STMWRF</b>	South Truckee Meadows Water Reclamation Facility
<b>TMRPA</b>	Truckee Meadows Regional Planning Agency
<b>TMSA</b>	Truckee Meadows Service Area
<b>TMWA</b>	Truckee Meadows Water Authority
<b>TMWRF</b>	Truckee Meadows Water Reclamation Facility
<b>TRA</b>	Truckee Resource Area
<b>TROA</b>	Truckee River Operating Agreement
<b>WC-3</b>	Washoe County Ballot Question No. 3
<b>WRWC</b>	Western Regional Water Commission

## **Chapter 6 Population Forecast and Projections of Water Demand, Peak Day Requirements and Wastewater Flow**

### **Purpose and Scope**

This chapter uses the *Washoe County Consensus Population Forecast* (Truckee Meadows Regional Planning Agency [“TMRPA”], 2014), the Truckee Meadows Water Authority (“TMWA”) 2016-2035 Water Resource Plan (“2016-2035 WRP”), and the TMRPA Population and Employment Model (“PEM”) as the basis for estimating the future needs of the Planning Area with respect to water demands including peak day requirements, wastewater flows and treatment capacity, effluent disposal and reclaimed water capacity. The chapter relies on data presented in preceding chapters and develops a water budget showing future water supplies available to public purveyors, wastewater flows by service provider in addition to capacities to dispose of effluent and use reclaimed water.

### **Summary and Findings**

The Western Regional Water Commission (“WRWC”) determined in 2016 that the draft Consensus Forecast population for 2036 can be supported by the sustainable water resources set forth in the Regional Water Plan. (It is acknowledged that 2036 is beyond the planning horizon of this RWMP. Please refer to Section 6.1.1 for an explanation of the limited use of the 2036 population forecast.)

The Washoe County Consensus Forecast is in close agreement with TMWA’s 20-year population forecast. Disaggregation of the Consensus Forecast using the parcel-based PEM provides a good tool for 20-year growth projections at a county-wide scale and for utility service areas.

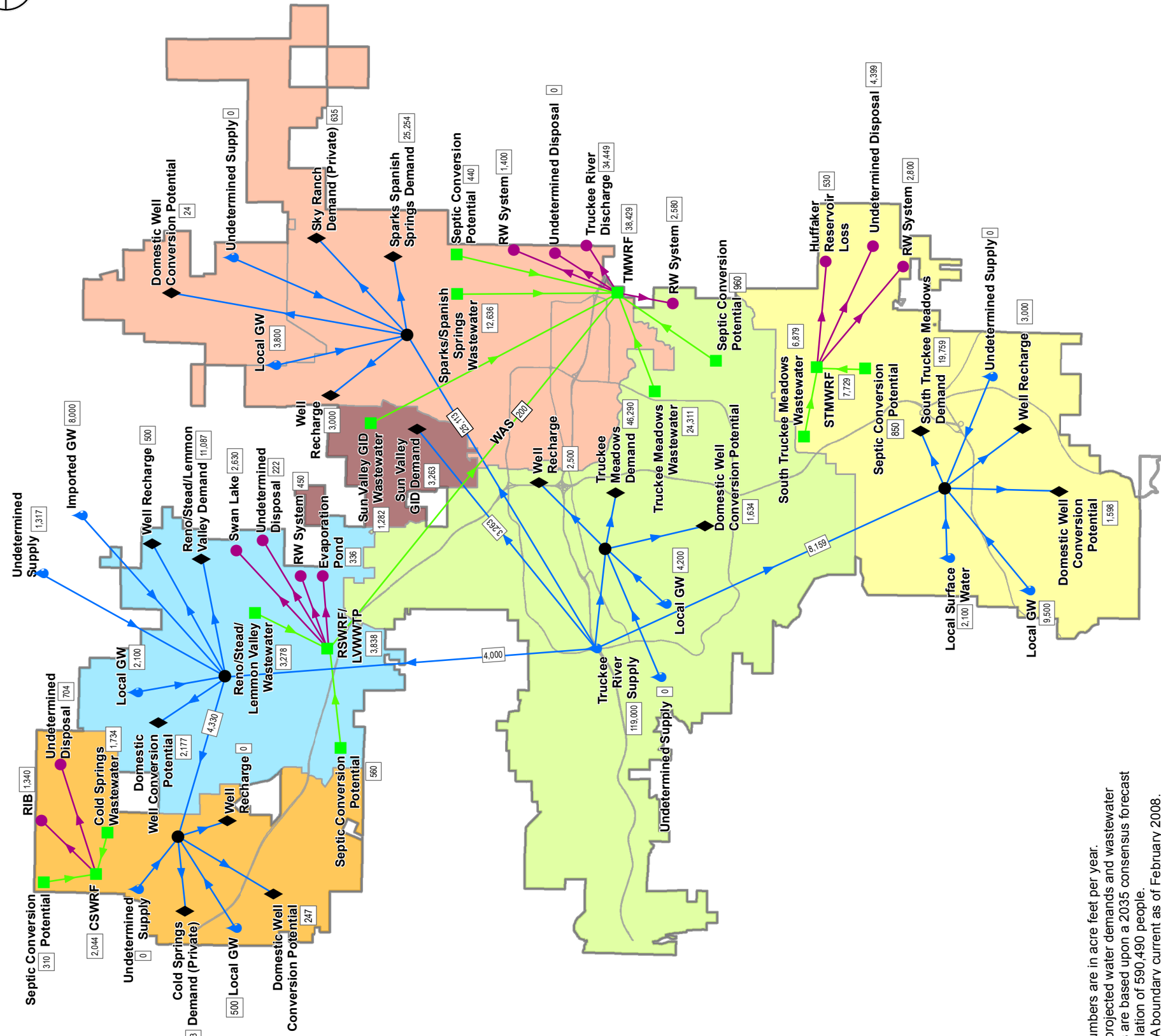
A Regional Water Balance Diagram has been developed covering five planning areas (Figure 6-1), which is a graphical representation of projected 2035 future conditions for water supply, wastewater treatment, reclaimed water and effluent disposal requirements. The following conclusions can be drawn from this evaluation:

### **Water Resources**

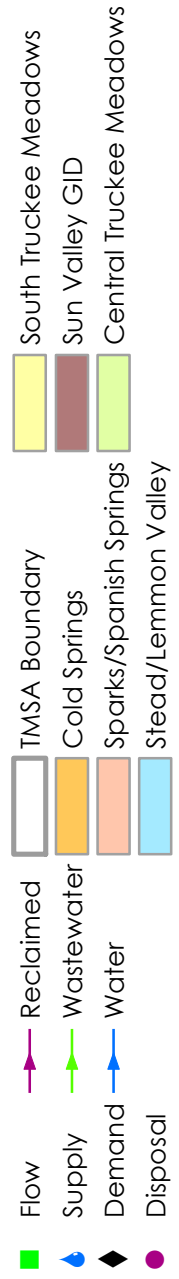
Overall, the region has available water resources to meet the projected 2035 increase in demand. These water resources include the *Truckee River Operating Agreement* (“TROA”) water supplies, the Fish Springs Water Importation Project, local basin groundwater supplies, and local tributary creeks. In addition to these water resources, the region has reclaimed water resources available for multiple uses from the Truckee Meadows Water Reclamation Facility (“TMWRF”), South Truckee Meadows Water Reclamation Facility (“STMWRF”), Reno Stead Water Reclamation Facility (“RSWRF”) and Cold Springs Water Reclamation Facility (“CSWRF”).

In the Truckee Meadows, a 2035 water supply surplus of more than 32,000 acre-feet (“af”) is projected, while a projected 2035 water supply deficit exists in Lemmon Valley.

There will continue to be local area impacts within portions of these planning areas where mitigation of groundwater level declines and impacts to shallow domestic wells will continue to be necessary.



- Notes:**
1. All numbers are in acre feet per year.
  2. The projected water demands and wastewater flows are based upon a 2035 consensus forecast population of 590,490 people.
  3. TMSA boundary current as of February 2008.
  4. Water systems included are TMWA, SVGID and Utilities Inc. in Cold Springs and Spanish Springs (Sky Ranch). Some small private water utilities are not included.
  5. Potential septic system conversion flows and domestic well demands are included in the demand estimates for the purpose of this water balance.
  6. Local groundwater supplies are based on the State Engineer's estimate of perennial yield or local management policy.
  7. TMWA's TROA water includes both surface water and local groundwater supplies, but the combined total capped at 119,000 (AFA).
  8. Allocation of water from Reno/Stead/Lemmon Valley to Cold Springs is based on the assumption, for the purpose of this water balance, that all Cold Springs demands are satisfied.
  9. This map does not assess what infrastructure is in place or will be needed to meet future conditions.
  10. It is assumed that TMWRF will have the ability to discharge 40 MGD to the Truckee River.



Planning Areas	Potable Water Balance		Deficit (-)/Surplus (+) Supply (AFA)
	Estimated Total of Demand and Exports (AFA)	Identified Supply Capacity Resource (AFA)	
Cold Springs	4,830	4,830	0
Reno Stead/ Lemmon Valley	15,417	14,100	-1,317
Sun Valley GID	3,263	3,263	0
Sparks/Spanish Springs	28,913	28,913	0
Central Truckee Meadows	86,824	119,000	32,176
South Truckee Meadows	19,759	19,759	0
Wastewater Balance			
Wastewater Service Areas	Estimated Flow (AFA)	Identified Disposal Capacity (AFA)	Additional Disposal Capacity Required (AFA)
CSWRF	2,044	1,340	704
RSWRF/LVWWTTP	3,838	3,616	222
TMWRF (RENO) (SPARKS)	38,429	44,806	0
STMWRF	7,729	3,330	4,399

**Figure 6-1**  
**2035 Regional Water Balance Map**

Washoe County, NV  
NAD 1983 StatePlane Nevada West FIPS 2703 Feet

DRAWN BY: C.J  
1ST REVIEW: JB  
DATE: 2/8/2017  
2ND REVIEW:  
PROJECT NO: 180101358

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## Wastewater

Long term disposal and reuse of treated effluent will be a challenge throughout the different planning areas. Both Cold Springs and Lemmon Valley have insufficient effluent reuse or disposal capacity to meet 2035 projections. Future effluent management options will need to be identified before 2035 to accommodate projected development.

In the Central Truckee Meadows, Sparks and Spanish Springs planning areas, effluent management options are adequate to meet projected 2035 needs, however discharge to the Truckee River through TMWRF may require implementation of advanced treatment technologies or other effluent management strategies to meet water quality constraints.

In the South Truckee Meadows planning area, 100 percent of the reclaimed water is used for irrigation. Based on the 2035 flow projections, approximately 4,400 af of additional water reclamation or disposal capacity will be required.

## Introduction

This chapter presents a summary of the process that was followed to determine whether the forecasted population for the year 2036 can be supported by the sustainable water resources potentially available within Washoe County. Furthermore, more detailed projections of future water demands including peak day capacity requirements, wastewater flow and wastewater treatment plant capacity needs have been compiled for the primary service areas within the region.

An analysis as to whether the forecasted population can be supported by the sustainable water resources was done in response to 2008 Washoe County Ballot Question No. 3 (“WC-3”) and January 2010 amendments to the *Truckee Meadows Regional Plan* (“Regional Plan”). The amendments, adopted in response to WC-3, provide for a comparison between the draft Consensus Forecast and the estimated population that can be supported by the sustainable water resources as identified in this Plan. As discussed in more detail in Section 2.2.1.1, amendments to the Regional Planning Governing Board (“RPGB”) Regulations on Procedure identify the Northern Nevada Water Planning Commission (“NNWPC”) and the WRWC as the entities to perform the comparison, and the WRWC as the body to make a determination and finding as to the results of the comparison. Section 6.1 deals exclusively with the comparison described in the 2010 Regional Plan amendments.

The remainder of the chapter focuses on estimates of future water demands and wastewater flows at the treatment plants consistent with the Consensus Forecast population projection for the primary service areas within the planning area. The planning areas are identified as Cold Springs, Stead/Lemmon Valley, the Washoe County portion of Spanish Springs, Sparks, Sun Valley General Improvement District, Truckee Meadows and South Truckee Meadows. A Regional Water Balance Diagram has also been developed, which is a graphical representation of possible future conditions for water supply, wastewater treatment, reclaimed water and wastewater disposal requirements. The Regional Water Balance Flow Diagram is useful to answer the following questions:

- How much potable water will be used in the future, and in what locations?
- From which sources will the potable water originate, and once used, where will it go for wastewater treatment?

- Following treatment, how much of the water will be reused, and where will the balance be disposed?
- Are there future imbalances in water supply, wastewater disposal or reclaimed water usage, and if so, in which planning areas?
- Are there planning areas with adequate capacity to address imbalances?

## **6.1 Comparison of the Consensus Population Forecast and the Estimated Population that can be Supported by the Sustainable Water Resources in the Planning Area**

As described in Section 2.2.1.1, the RPGB identified the NNWPC and the WRWC as the entities to perform a comparison of the draft Consensus Forecast with the estimated population that can be supported by the sustainable water resources as set forth in this Plan prior to the adoption of the Consensus Forecast.

### **6.1.1 Consensus Population Forecast**

The TMRPA compiles the Washoe County Consensus Forecast every two years using data from TMWA, Global Insight, Woods and Poole, and the State Demographer. In 2010, the Consensus Forecast projected a population of approximately 590,500 for the year 2030, the 2012 version projected a 2032 population of 560,772 and the 2014 version projected a 2034 population of 563,779. The most recent version, the 2016 Consensus Forecast, projects that the total population in Washoe County will grow from 450,747 in 2016 to 548,159 in 2036. It was determined, since the TMRPA had submitted the draft 2036 forecast, and the WRWC had conducted the comparison described above in the Introduction prior to the RWMP public review process, that the 2036 estimates and conclusions would be appropriate for inclusion in this Section.

The 2016-2035 WRP sets forth its current population estimate for 2036 to be 548,187 persons, which estimate is consistent with the draft 2016 Consensus Forecast of 548,159 persons for the year 2036.

### **6.1.2 Water Resources**

Table 2-1, Water Resources Baseline, provides long-range planning-level estimates for sustainable water resources using the best available information. The table identifies selected hydrographic basins within the Planning Area and quantifies surface water and groundwater in two ways. Appropriations (water rights), including decreed rights and rights permitted or certificated by the State Engineer for municipal and industrial (“M&I”) use and those that may be converted to M&I use, are quantified separately from those that cannot be converted to M&I use.

The Water Resources Baseline acknowledges *TROA*’s effect on the availability and sustainability of Truckee River water. *TROA* is designed to provide long-term sustainable water operations for the multiple stakeholders on the Truckee River system through the continued use of water rights converted from irrigation to M&I use. The Truckee Meadows community benefits greatly from *TROA* implementation in that it provides for significant storage capacity in upstream reservoirs that can be integrated with other water resources to maximize the yield of the Truckee River.

The Water Resources Baseline also shows the quantity of groundwater in each basin consistent with the State Engineer's estimates of perennial yield. In basins where appropriations for M&I use (or those that may be converted to M&I use), are less than the perennial yield estimate, only those water rights actually appropriated are considered to be sustainable. The table includes basins that may provide M&I water supplies within a 20-year planning timeframe. This assumes importation of groundwater from hydrographic basins in Washoe County that are not presently providing water for M&I use.

The Water Resources Baseline in the 2011 Regional Water Plan estimated sustainable water resources potentially available in Washoe County to be approximately 183,200 af per year. The estimate is slightly increased in the 2016 update, to approximately 190,500 af per year, based on a recent review of State Engineer records.

### **6.1.3 Water Demand and Population Projections**

The 2016-2035 WRP contains a long-range water demand projection for TMWA's projected service area. Using TMWA's methodology, the NNWPC performed a water use projection for the entire County that yielded an annual demand of approximately 116,000 af to support a population of approximately 548,159 persons as projected for the year 2036 by the 2016 Consensus Forecast. TMWA's methodology is published in detail in its 2016-2035 WRP, Chapter 4.

### **6.1.4 Conclusions**

The WRWC determined in 2016 that the draft Consensus Forecast population for 2036 can be supported by the sustainable water resources set forth in the Regional Water Plan. The downward trend in 20-year population projections while holding available resources relatively constant meets the expectations of WC-3 and the Regional Plan amendments.

## **6.2 Projections of Water Demand, Peak Day Requirements and Wastewater Flow for Service Areas**

Given that sustainable water resources are potentially available to meet 20 years of growth in the Planning Area, more detailed projections of future water demands, including peak day capacity requirements, wastewater flow, wastewater treatment plant capacity and effluent management needs are required to estimate future infrastructure requirements and costs.

The 2016-2035 WRP projects water demand through the year 2035 to ensure that the utility will have the necessary water resources and facilities to serve its service area population. Projected water demand is based on projected population and water service connections through the planning period. Projected water demand has four main components: (1) Residential demand, (2) Commercial demand, (3) Irrigation demand, and (4) System losses. Each of these components is projected using established historic water demand factors. The projections include estimates of land use consumption, growth in dwelling units and commercial buildings, and were developed in a four-step modeling process as follows:

- Future population is projected for Washoe County.
- The number of single-family buildings, multi-family dwelling units, and commercial buildings are projected as a function of the population projection.

- A relationship between active water services and buildings is developed to project the number of new active water services, including water use coefficients which are estimated for each customer class using historic billed water use.
- The building projections are combined with the water services and water use coefficients to create the total water demand projection.

The total demand for water is dependent on three general demands or uses: (1) residential consumption of water for internal household purposes; (2) commercial consumption of water as an input to producing goods and services in the local economy (i.e., each business has a demand for water that is dependent of the type of business and the building that it occupies); and (3) residential and commercial consumption of water for irrigation purposes. TMWA’s population forecast and water demand projection methodologies are described in Chapter 4 of its 2016-2035 WRP.

### 6.2.1 Water Demand Projections

Following this methodology, projected 2015 through 2035 average day water demands were developed, which are presented in Table 6-1. The 2035 total TMWA wholesale and retail potable water demand projection is 94,843 af, including the Truckee Resource Area (“TRA”) and the non-TRA, which are defined in the 2016-2035 WRP and described in Chapter 3. The Regional Water Plan considers the area where municipal services are to be provided within the Truckee Meadows Services Area, which is a subset of the larger area of Washoe County, but extends beyond TMWA’s wholesale and retail areas to include parts of Washoe County served by private water purveyors and domestic wells (see Chapter 3). Table 6-1 presents the projected water use within the TRA, non-TRA and non-TMWA areas. System loss is included, calculated using an estimate of six percent of the total demand. TMWA’s projections for peak day production requirements appear in Table 6-2.

**Table 6-1 Projected Water Use Through 2035 (AF per year)**

Year	TMWA			Non-TMWA	Total
	TRA	Non-TRA	Subtotal		
2015	76,567	217	76,784	4,951	81,735
2020	82,628	238	82,866	5,388	88,254
2025	87,340	254	87,594	5,789	93,383
2030	91,260	268	91,528	6,175	97,703
2035	94,563	280	94,843	6,555	101,398

**Table 6-2 TMWA Peak Day Production Requirements**

Year	Estimated Production (af)	Non-Drought Year Peak Day Consumption (MGD)	Drought Year, Peak Day Consumption (MGD)
2020	82,628	133.2	119.9
2025	87,340	140.8	126.7
2030	91,260	147.1	131.2
2035	94,563	152.4	137.2

MGD = million gallons per day



### **6.2.2 Wastewater Flow Projections**

Similar to the previous section, a projection of future wastewater flows for each major wastewater service area was developed to estimate 2035 wastewater treatment capacity and effluent management needs. The wastewater flow estimates were developed by TMRPA using a parcel-based spatial allocation of the Consensus Forecast for population and employment. The process is summarized below.

- Translate time-series population projections to spatial allocation of housing units and employment;
- Aggregate to sub-areas, i.e., hydrographic basins and wastewater service areas;
- Select appropriate TMWA water use coefficients to estimate indoor water use for residential and non-residential customer classes;
- Develop residential and non-residential average water use factors;
- Calculate wastewater flows by wastewater service area, compare to 2015 average day annual flows (“ADAF”) observed at each water reclamation facility and develop weighted factors for best fit; and
- Calculate 2035 wastewater flow projections for wastewater service areas and facilities.

TMRPA used indoor water usage coefficients provided by TMWA to estimate wastewater generation by parcel for the Truckee Meadows Service Area. The coefficients were based on the averages for each service as shown in Table 6-3. Multiple-unit residential metered service (“MMWS”) is categorized as multi-family units, while residential metered service (“RMWS”) represents single family residential units and general metered water service (“GMWS”) represents non-residential. Residential calculations were relatively straightforward since TMRPA’s parcel level data projects annual housing units. The MMWS and RMWS factors can be applied directly to those annual housing unit estimates to calculate wastewater generation over the 20-year planning horizon. However, non-residential wastewater projections were not as straightforward because TMRPA’s parcel level data projects employees, while TMWA’s coefficient for non-residential (indoor) water use is based on each metered service (GMWS). To apply TMRPA projections to the GMWS coefficient it was necessary to create a relationship between employees and metered service.

Since TMRPA has GMWS data by parcel number and business point data for 2015, it was possible to find the number of existing meters per parcel and the number of businesses per parcel and calculate a ratio of meters per business. Furthermore, business point data reveals the number of employees per business allowing the creation of a second ratio. Both ratios were applied to the GMWS coefficient using a weighted average of businesses per employee and meters per business, giving more weight to a parcel with more businesses and more meters.

**Table 6-3 TMWA Indoor Water Use Coefficients**

Hydro-basin	Indoor Water Usage (1,000 gal)						
	Annual Indoor Usage						
	GMWS	GMWS Meters	MMWS (per customer)	MMWS (per unit)*	Multi-Family Units	RMWS	Single-Family Units
83	170.4	-	-	-	3		213
85	265.8	206	325.1	32.5	944	51.5	17407
86	201.9	19	193.5	19.4	234	64.4	6079
87	481.5	5646	356.5	35.7	49501	55.4	78137
088E	-	-	-	-	8	36.0	2093
088W	116.2	-	-	-	8	30.5	2093
89	101.6	-	-	-	33	24.0	1898
92	397.5	270	415.8	41.6	1231	55.3	11710
Average	247.8	-	322.7	32.3	-	45.3	-
Weighted Average	469.67	-	-	35.7	-	54.0	-

\*Assumes an average of 10 units per service.

The equation that converts employee projections by parcel to meters per parcel is:  $(Employees) \times (Businesses/Employee) \times (Meters/Businesses) = Meters$ . With an estimated number of meters per parcel TMRPA applied the 469.67 GMWS weighted usage coefficient and estimated wastewater generation by parcel. Weighted wastewater generation factors for single family dwelling units, multifamily dwelling units and non-residential units are shown in Table 6-4.

**Table 6-4 Weighted Wastewater Generation Factors**

Dwelling Unit Type	Unit	(Units×Coefficient×Gallons)÷365days	Total Wastewater Generation (GPD)
Single Family (weighted)	1 Dwelling Unit	$(1 \times 53.992 \times 1000) \div 365 =$	148
Multi-Family (weighted)	1 Dwelling Unit	$(1 \times 35.661 \times 1000) \div 365 =$	98
Non-Residential (employee-weighted)	1 Employee	$(1 \text{ employee} \times 0.075 \times 0.49)(469.67 \times 1000) \div 365 =$	47 Gallons Per Employee

GPD = gallons per day

Parcel-level data were used to estimate 2015 residential and non-residential wastewater generation, summed for each wastewater service area and compared to 2015 ADAF observed at the water reclamation facilities. Table 6-5 shows that the total calculated wastewater flows for the region is within 2.6 percent of the observed data. This methodology very slightly over-estimates regional wastewater flows compared to 2015 observed flows.

**Table 6-5 Comparison of Calculated Residential and Non-residential Wastewater Flows to 2015 Average Day Annual Flows Observed at Water Reclamation Facilities**

Water Reclamation Facility	Residential (weighted)	Non-Residential (employee-weighted)	Calculated Total Wastewater Generation (GPD)	Observed 2015 Average Day Annual Flow (GPD)	Comparison Percentage of ADAF
TMWRF	17,308,352	9,479,288	26,787,640	26,330,000	101.74%
STMWRF	2,191,808	1,147,593	3,339,401	3,000,000	111.31%
RSWRF	1,104,804	354,498	1,459,302	1,400,000	104.24%
CSWRF	305,661	19,418	325,080	297,000	109.45%
LVWRF	123,916	59,005	182,921	260,000	70.35%
Totals	21,034,541	11,059,802	32,094,344	31,287,000	102.58%

The same methodology was used to project future wastewater generation by service area, shown in Table 6-6 in five-year increments. The 2035 wastewater flow projections are reasonable for the intended purpose of projecting future flows at each of the regional wastewater reclamation facilities. The 2035 wastewater flow projections represent the ADAF that can be expected at the regional wastewater reclamation facilities. Some variability should be anticipated in the actual capacity and process improvements that will be necessary in the future at each individual facility, as wastewater treatment is a complex combination of physical, biological and hydraulic processes. This is in addition to the inherent uncertainty of when and where future development will occur over the next 20 years.

**Table 6-6 Projected Wastewater Flow by Water Reclamation Facility in Five-Year Increments**

WRF	Predicted Wastewater Generation (GPD)			
	2020	2025	2030	2035
TMWRF	944,552	1,879,823	2,908,777	3,837,390
STMWRF	379,340	785,214	1,122,785	1,509,522
RSWRF	197,356	430,932	681,712	863,068
LVWRF	61,352	191,631	294,188	368,182
CSWRF	34,276	73,576	191,203	458,883
Totals	1,616,876	3,361,176	5,198,666	7,037,046

Design of each process must take into account not only significant variations in flow, but variability in loading, or strength, of numerous constituents such as biological oxygen demand, suspended solids, dissolved solids and nutrients. When future improvements are required at the regional wastewater reclamation facilities, a detailed facility plan or engineering design report will be prepared that defines the specific process improvements and capacity requirements. This detailed information will take precedence over the “planning level” flow and capacity projections presented in this Plan.

### 6.3 Water Balance Model

A Regional Water Balance Map has been developed that presents a graphical representation of the projected 2035 conditions for the water supply, wastewater treatment, reclaimed water and wastewater disposal requirements. In the map, the region is divided into six planning areas based

on jurisdictional boundaries and wastewater service areas. The Regional Water Balance Map is useful in answering the following questions:

- How much potable will be needed within each planning area?
- What water resources are available to meet the future potable water demands and where are they located?
- How much wastewater will be generated in each of the planning areas?
- Where will the resulting wastewater go for treatment?
- Following treatment, how much of the water will be reused, and where will the balance be disposed?
- Are there future imbalances in water supply, wastewater disposal or reclaimed water usage, and if so, in which planning areas?
- Are there planning areas with adequate capacity to address imbalances in other areas?

The Regional Water Balance Map was developed using consensus forecast growth and development projections for 2035 provided by the TMRPA. The TMRPA also provided potable water demands and wastewater flow factors for each parcel assumed to be developed in 2035. Estimates of water importations/exportations between planning areas were provided by TMWA and are based on anticipated management strategies intended to minimize future deficits within each planning area. Allocations between planning areas may change as needed to accommodate variations in growth patterns.

Well recharge amounts are also based on management strategies reported by TMWA and are intended to improve long-term reliability of groundwater supplies. Domestic well and septic system conversion estimates were held consistent with the estimates presented in the 2011 Regional Water Plan because very few, if any, conversions have occurred since that time.

Estimates of effluent disposal amounts are based on current practices and permit conditions. At TMWRF, effluent disposal is constrained by water right return flow requirements and permit limitations on the discharge of total phosphorus, total nitrogen, and total dissolved solids. To meet the projected disposal rates to the Truckee River by TMWRF, additional treatment process may be required to achieve the estimated Truckee River discharges.

The 2035 reclaimed water demands are based on 2016 use reported by the City of Reno, the City of Sparks and Washoe County. As a conservative approach, it is assumed no additional reclaimed water users will be added and the amount of reclaimed water used will remain constant. However, additional reclaimed water users could be served if needed and thereby reduce effluent disposal needs.

The following is a general overview of the data presented in the Regional Water Balance Map:

- All numbers are shown in acre feet annually (“afa”).
- The planning areas are consistent with the *City of Reno and Washoe County Truckee Meadows Service Area (“TMSA”)/Future Service Areas (“FSA”) Water Wastewater and*

*Flood Management Facility Plan* (ECO:LOGIC, 2007) and the *City of Sparks TMSA/FSA Conceptual Facility Master Plan* (Stantec, 2008). These areas are also representative of the sewer service boundaries of the regional wastewater treatment facilities.

- The potential conversion of domestic wells to the municipal water system is shown as a water demand.
- The potential conversion of individual septic systems to the municipal sewer is shown as a wastewater flow.
- Local groundwater supplies are shown equal to the perennial yield of the respective basin or local management policy.
- Water supplies, wastewater treatment capacity and disposal constraints are identified for each planning area.
- Current groundwater recharge quantities are shown as a demand on the municipal water system.
- TMWA's TROA supply includes both groundwater and surface water supplies. However, the combined resource is capped at 119,000 afa.
- Undetermined Water Supply is called out if there are insufficient water resources identified in the planning area to meet the projected 2035 water demands.
- Undetermined Disposal is called out if there is insufficient disposal capacity, i.e., discharge to the Truckee River, rapid infiltration basins, and/or reclaimed water irrigation demands to meet the projected 2035 wastewater flows.
- Future reclaimed water demands are based on the reported 2015 consumption. If new reclaimed water facilities and customers are added, there would be a corresponding decrease in the quantity shown in Undetermined Disposal or in one of the other disposal categories.
- Additional reclaimed water may be available from TMWRF and is not necessarily limited to the amount shown.
- This analysis does not assess the existing infrastructure capacity or identify any additional infrastructure needed to meet future conditions.

The Regional Water Balance map for 2035 is presented in Figure 6-1. Table 6-7 presents the conclusions drawn from this evaluation.

**Table 6-7 Regional Water Balance Key Findings**

<b>Planning Area</b>	<b>Water Balance</b>	<b>Wastewater Balance</b>
<b>Cold Springs</b>	Total estimated 2035 demand is 4,583 afa (Utilities Inc.). Additional supply will come from Reno/Stead/Lemmon Valley	Future septic tank conversion potential is 310 afa
	Future domestic well conversion potential of 247 afa	Future treatment deficit is 700 afa
	No expected water supply deficit in 2035	Future undetermined disposal capacity is 704 afa
<b>Reno Stead/Lemmon Valley</b>	Total estimated demand is 11,087 afa plus an additional 4,330 afa will be exported to Cold Springs	Future septic tank conversion potential is 560 afa
	Well recharge is 379 afa	Future treatment deficit is 1,262 afa
	Future domestic well conversion potential is 2,177 afa	Future undetermined disposal capacity is 222 afa, using current maximum disposal capacity to Swan Lake
	8,000 afa Fish Springs water supply available	
	Importation of 4,00 afa from TROA supplies Future 2035 deficit of 1,317 afa	
<b>Sparks/Spanish Springs</b>	Total estimated demand is 25,254 afa	Future septic tank conversion potential is 440 afa
	Well recharge is 3,000 afa	Future wastewater flow is 12,636 afa
	Future domestic well conversion potential is 24 afa	Wastewater is treated at TMWRF
	Requires importation of 25,113 afa from TROA supplies	
<b>Central Truckee Meadows</b>	Total estimated demand is 42,156 afa	Future septic tank conversion potential is 960 afa
	Future domestic well conversion potential is 1,634 afa	Future wastewater flow is 24,311 afa
	Well recharge is 3,000 afa	Wastewater is treated at TMWRF
	Supply surplus is 32,176 afa	
<b>South Truckee Meadows</b>	Total estimated demand is 15,161 afa	Future septic tank conversion potential is 850 afa
	Future domestic well conversion potential is 1,598 afa	Future wastewater flow is 7,729 afa
	Well recharge is 3,000 afa	Future treatment deficit is 1,008 afa
	Water supplies will be local groundwater (9500 afa), local surface water (2,100 afa), and imported TROA (8,159 afa)	Future undetermined STMWRF disposal capacity is 4,399 afa

### **6.3.1 Water Supplies**

The water resources identified for the planning areas include the *TROA* water supplies, the Fish Springs Water Importation Project, local basin groundwater supplies, and local tributary creeks (Thomas and Whites Creeks). In addition to these water resources, the region has reclaimed water resources that are available for multiple uses from the TMWRF, STMWRF, RSWRF and CSWRF.

Overall, the identified resources are sufficient to meet the projected 2035 demands. However, there is a projected localized supply deficit in the Reno Stead/Lemmon Valley area. Additional importation will be necessary to meet future Reno Stead/Lemmon Valley area demands. TMWA water resource management practices are to implement a conjunctive use strategy that limits groundwater pumping and maximizes surface water utilization when it is available to achieve sustainable conditions. This requires the expansion of current well recharge programs during winter and spring conditions when surface water is available.

It should be noted that there will continue to be localized areas within portions of these planning areas where groundwater level declines and impacts to shallow domestic wells will need to be mitigated. The Mt. Rose fan area is an example of this situation. Relatively shallow domestic wells that penetrate only the upper portion of the aquifer will continue to be affected by regional water level declines as a result of the combined pumping of both municipal and domestic wells. These localized conditions can be mitigated, in part, through regional water management strategies that seek to improve groundwater conditions through recharge and improved surface water management.

### **6.3.2 Wastewater Treatment and Disposal**

Long-term disposal of treated effluent will be a challenge throughout the region. Notably, areas with disposal that rely on reuse strategies, discharge to closed basins, or discharge to rapid infiltration basins will have the greatest challenges. Future disposal options will need to be identified before 2035 to accommodate development. Options for increasing effluent disposal include expanded use of reclaimed water for irrigation and industrial uses, and/or high level treatment of a portion of the effluent for indirect potable reuse or to recharge local groundwater basins.

Management options to address the need for additional disposal capacity include:

- Connect additional reclaimed water users to the existing Reno and Washoe County systems in the Reno Stead/Lemmon Valley area, a topographically closed basin. Reclaimed water irrigation use helps to manage the amount of water discharged to Swan Lake. However, this is a seasonal use and other options may be needed during limited irrigation periods, particularly during the months of May and October.
- Investigate the feasibility of discharging to new rapid infiltration basins or drainages outside the planning areas.
- Investigate the merits of supplying reclaimed water for year-round industrial uses within and possibly outside the TMSA.
- Develop a reuse system in Cold Springs.

- Continue to investigate the feasibility of implementing a groundwater recharge program using high quality reclaimed water. Groundwater recharge can provide an efficient and productive use of the reclaimed water resources, and can be one component to help mitigate the identified water supply imbalances in several planning areas.

In the South Truckee Meadows planning area, 100 percent of the reclaimed water is used for irrigation. Based on the 2035 flow projections, approximately 4,400 afa of additional disposal capacity will be required. This represents an increase of over two times the current level of reclaimed water use. Washoe County has ongoing efforts to continue to expand the reclaimed water system and has developed facility plans that describe potential treatment expansion and effluent management.



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