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### List of Abbreviations and Acronyms

<b>2016-2035 WRP</b>	TMWA's 2016-2035 Water Resource Plan
<b>2030 WRP</b>	TMWA's 2030 Water Resource Plan
<b>ACOE</b>	Army Corps of Engineers
<b>af</b>	Acre-Feet
<b>af/yr</b>	Acre Feet Per Year
<b>afa</b>	Acre Feet Annually
<b>ASR</b>	Aquifer Storage and Recovery
<b>CSWRF</b>	Cold Springs Water Reclamation Facility
<b>CTMRD</b>	Central Truckee Meadows Remediation District
<b>DRI</b>	Desert Research Institute
<b>ET</b>	Evapotranspiration

<b>GIS</b>	Geographic Information System
<b>gpm</b>	Gallons Per Minutes
<b>ISWPP</b>	Integrated Source Water Protection Program
<b>M&amp;I</b>	Municipal and Industrial
<b>MGD</b>	Million Gallons Per Day
<b>NDEP</b>	Nevada Division of Environmental Protection
<b>NNWPC</b>	Northern Nevada Water Planning Commission
<b>NPDES</b>	National Pollutant Discharge Elimination System
<b>NRS</b>	Nevada Revised Statutes
<b>NVI</b>	North Valleys Initiative
<b>PCE</b>	Perchloroethylene
<b>PLPT</b>	Pyramid Lake Paiute Tribe
<b>RIB</b>	Rapid Infiltration Basin
<b>RO</b>	Reverse Osmosis
<b>RSWRF</b>	Reno-Stead Water Reclamation Facility
<b>RWPC</b>	Regional Water Planning Commission
<b>SS/FS</b>	Sparks Solvent/Fuel Site
<b>STMGID</b>	South Truckee Meadows General Improvement District
<b>STMWRF</b>	South Truckee Meadows Water Reclamation Facility
<b>SWPCC</b>	Storm Water Permit Coordinating Committee
<b>TDS</b>	Total Dissolved Solids
<b>TMDLs</b>	Total Maximum Daily Loads
<b>TMRPA</b>	Truckee Meadows Regional Planning Agency
<b>TMWA</b>	Truckee Meadows Water Authority
<b>TMWRF</b>	Truckee Meadows Water Reclamation Facility
<b>TRA</b>	Truckee Resource Area
<b>TRI Center</b>	Tahoe Reno Industrial Center
<b>TROA</b>	Truckee River Operating Agreement
<b>UNR</b>	University of Nevada, Reno
<b>WCCSD</b>	Washoe County Community Services Department
<b>WCDWR</b>	Washoe County Department of Water Resources
<b>WHPP</b>	Wellhead Protection Plans
<b>WQSA</b>	Water Quality Settlement Agreement
<b>WRWC</b>	Western Regional Water Commission

## Chapter 9 Issues and Action Plan

### Purpose and Scope

The following sections develop summaries of regional water management issues that are introduced and discussed in preceding chapters. Summaries briefly discuss work that has been performed in response to the issues, identify alternatives if developed, and identify work needed to respond to remaining and newly identified issues. Proposed Action Items shown in F-2 are recommendations for future work intended to guide the focus and activities of the Western Regional Water Commission (“WRWC”) and the Northern Nevada Water Planning Commission (“NNWPC”) for the next five years.

### Introduction

Planning is an ongoing, iterative and evolutionary process that must adapt to changing conditions in the Planning Area. Uncertainty associated with changes that may occur over the next five years with factors such as the economy, funding sources for major infrastructure, population growth trends, the legal and regulatory environment, and climate projections, affect the recommendations for future work and the priority of those recommendations significantly. In addition, unforeseen conditions may require entirely new future-work recommendations.

The following issue summaries are organized by category and as appropriate, geographic area, within a category. Key points are identified and briefly discussed under “Specific Issues and Linkages.” “Alternatives Evaluated to Address the Issues” summarizes work that has been performed in response to the issues. “Proposed Action Items” identify follow up activities proposed for the WRWC, NNWPC or other appropriate entities. Proposed Action Items under each of the numbered issue categories have unique identification numbers for reference in Table 9-2 and Table 9-3 (pages 9-39 and 9-41, respectively). Table 9-2 compiles Proposed Action Items related to all issues identified in this chapter. It also identifies a lead agency, coordinating agencies and whether the WRWC or NNWPC have a role in addressing the item. The table also indicates whether the item is currently being addressed by ongoing work, or expected to be addressed within the five-year *Regional Water Plan* update timeframe. The identification of lead and coordinating agencies is not intended to create a particular financial obligation on the part of any entity.

Table 9-2 includes only items for which the WRWC or NNWPC have a role and are to be addressed in the next five years. As stated above, this table is intended to provide guidance to the NNWPC and WRWC for work in the coming five years and form the basis for annual work plans. The NNWPC acknowledges that new information may result in the need to add or change the emphasis of Proposed Action Items, or eliminate them altogether, as may be appropriate from time to time.

### 9.1 Municipal Water Resources

#### Truckee Meadows Water Authority, 2016-2035 Water Resource Plan

##### *Specific Issues and Linkages*

The Truckee Meadows Water Authority (“TMWA”) developed and adopted its *2016-2035 Water Resource Plan* (“2016-2035 WRP”) in March 2016. In December 2009, *TMWA’s 2030 Water Resource Plan* (“2030 WRP”) was adopted following plan review, update, and/or modification of

its water resource planning and management strategies. Key events that have occurred or been completed since adoption of the 2030 WRP include:

- In response to the WRWC legislative directive to evaluate the potential consolidation of water purveyors in the Truckee Meadows, staffs of TMWA and Washoe County Department of Water Resources (“WCDWR”) successfully merged the former Washoe County water utilities and the South Truckee Meadows General Improvement District (“STMGID”) into TMWA on December 31, 2014.
- The five Mandatory Signatory Parties - TMWA, the Pyramid Lake Paiute Tribe (“PLPT”), the United States, California and Nevada - completed all conditions precedent to implement Truckee River Operating Agreement (“TROA”) in the fall of 2015; TROA was implemented on December 1, 2015. TROA’s framework provides flexibility for river operations to allow parties to store water they previously could not store; significantly enhances TMWA’s drought reserves; allows the exchange of water to optimize the use of Truckee River supplies without injuring the water rights on which the parties rely; and resolves future regulatory uncertainties surrounding the use of the Truckee River.
- TMWA’s population forecast estimates total Washoe County population to increase by 95,000 from 450,000 in 2016 to 545,000 in 2035, or 21 percent; the estimated population served by TMWA will increase by 83,000 people from 392,000 in 2016 to 475,000 by 2035, or 21 percent. The population estimates may change over time as the pace of development within the region or its sub-area varies, and as the region moves towards greater intensification of land use. TMWA’s forecast results are statistically similar to the State Demographer’s near-term projections.
- Water demand-per-service within TMWA’s service areas has been decreasing over time resulting in slower total demand growth in TMWA’s extended forecast. Based on the review of current growth and economic trends in the region, future water demand is anticipated to grow in the central Truckee Meadows but at a slower pace than historically seen. The water production forecast for a typical year indicates that from 2016 to 2035, production will increase from current estimates for 2016 of approximately 83,000 acre-feet (“af”) to a projected 2035 demand of approximately 101,000 af, or about 18,000 af. The 2035 production is well within the maximum 119,000 acre feet per year (“af/yr”) under TROA operations.

Linkages: Water rights balance with TROA implementation and wastewater effluent reuse.

#### *Alternatives Evaluated to Address the Issues*

The adopted 2016-2035 WRP presents Key Findings and Recommended Actions associated with the issues identified above. These Key Findings and Recommendations are not reiterated within this Plan; however, several of the significant recommendations are summarized below. (Note: for further detail on these recommendations, the reader is referred to 2016-2035 WRP, see Appendix B).

TMWA Planning Area: As a result of the merger and expansion of the area that TMWA now plans for, determine the role and extent of TMWA’s water resource planning subject to the constraints of TMWA’s Joint Powers Authority.

Sustainability of Source Water Supplies -- Climate Variability: Continue to consider, when available, new findings from climate change research for the greater Truckee Meadows region; continue working with the University of Nevada, Reno (“UNR”), Desert Research Institute (“DRI”), and other researchers to test climate change effects on TMWA’s sources of supply; and engage UNR, DRI and/or other researchers to develop tree ring chronologies of the Truckee and Carson River watersheds for use in water resource planning and management during droughts and periods of drought recovery beyond historic, instrumental record.

Sustainability of Source Water Supplies Related to Drought: The TMWA Board continues to use for planning purposes the worst eight-year drought cycle of hydrologic record for the Truckee River, 1987-1994.

Sustainability of Source Water Supplies -- Surface Water Contamination: The Continue to: (1) implement its source water protection strategies in cooperation with local entities; (2) maintain, as a minimum, the ability to meet daily indoor water use with its wells; and (3), for river outages lasting up to seven days during the summer, maintain the ability to meet average daily water demands using its wells, treated water storage, and enhanced conservation measures.

Sustainability of Source Water Supplies -- Groundwater Contamination: Continue to: (1) provide safe drinking water in all areas affected by perchloroethylene (“PCE”) and septic effluent; (2) investigate the impact to groundwater from PCE and septic effluent; (3) work closely with local jurisdictions to find resources and strategies to convert residences and businesses on septic to sewer; and (4) utilize aquifer recharge as a potential strategy to keep contaminated water away from production wells.

Sustainability of Source Water Supplies -- Groundwater Management: Continue to: (1) reduce impacts to groundwater by pumping municipal wells strategically; (2) allow water levels to recover through passive groundwater recharge; and (3) augment water level recovery through active groundwater recharge. Increasing the breadth and scope of all three of these activities in areas formerly served by WCDWR will help groundwater levels recover in areas most affected by groundwater level declines.

Sustainability of Source Water Supplies –Aquifer Storage and Recovery: Continue and expand the injection of treated surface water into groundwater aquifers to: (1) augment groundwater supplies which provide additional drought and peak-demand capacity; (2) reduce or eliminate water quality concerns; and (3) stabilize and increase groundwater levels. Increasing the breadth and scope of all three of these activities throughout the service area will help maintain groundwater levels and may help reduce the impact from septic, industrial, and naturally-occurring contaminants.

Water Rights Availability: Continue to accept the dedication of Truckee River water rights in the growth prone Truckee Meadows, Spanish Springs and South Truckee Meadows, which water rights are sufficient to support both TROA implementation and increased future development needs within Truckee Resource Area (“TRA”); recognize Fish Springs Water Importation Project is available to meet future demands in the North Valleys, and unless other resources are available in the non-TRA systems, these systems are limited to the resources dedicated for the development within the system’s service area..

Conjunctive Management of Water Resources: Continue to rely on TMWA’s pool of resources to meet current demands and recognize TROA can provide drought-year operational benefits in excess of current drought-year reserves thereby supporting future demands and continue to monitor TMWA’s ability to meet current and future demands through a repeat of a 1987 to 1994

drought period, the worst drought period of record, and based on factors such as demand growth, conservation improvements, hydrologic cycles, climate changes, etc., update the Board when future conditions evolve that require changes to the planning criteria or supply operation.

Water Demand Management: Accept the Water Conservation Plan outlined in the 2016-2035 WRP.

Future Water Resources: Continue to investigate, evaluate, and negotiate, where appropriate, other potential water supply projects consistent with and/or in addition to TROA.

### **Proposed Action Items**

9.1.A Drought Standard – The NNWPC recommends the use of the Eight-Year Drought Cycle, from 1987 to 1994 for consistency with TROA and TMWA planning, and review as necessary during the next update of this Plan.

9.1.B Water Supply Development – Continue to investigate sustainable water supply projects that are socially, economically and environmentally feasible and that can be implemented to ensure water supplies are available, as future demands require.

9.1.C Participate in the DRI cloud seeding program for the Lake Tahoe basin and the Truckee River basin, and coordinate with DRI's efforts to continue the cloud seeding program statewide and support reinstatement of state funding.

9.1.D Adopt 2016-2035 WRP into the 2016 Regional Water Plan.

### **Relevant Planning Documents**

- 2016-2035 WRP; and
- TROA, 2008, [www.usbr.gov/mp/troa/final/troa\\_final\\_09-08\\_full.pdf](http://www.usbr.gov/mp/troa/final/troa_final_09-08_full.pdf).

#### **9.1.1 Creation of New Water Systems**

After consolidation of Washoe County's water utility into TMWA, Washoe County revised Article 422, which now allows for the creation of new, privately owned water utilities within unincorporated Washoe County. Policy 1.2.h addresses Washoe County's revised development code, requiring a development/property owner to comply with TMWA or other applicable regulatory requirements and standards for infrastructure and to ensure adequate water supply. In addition, there are approximately 70 public water systems in Washoe County, many of which are single-well systems typically serving developments such as a small number of commercial buildings or a mobile home park. Most of these systems exist within municipal boundaries and are not subject to Article 422. From time to time, TMWA has discussions with owners of these kinds of systems about possible expansion, acquisition or service from TMWA.

### **Alternatives Evaluated to Address the Issues**

Prior to acquisition or providing service, TMWA typically requires systems to be improved to its standards, in part to avoid placing the cost of acquisition or service on existing customers. New systems, or those proposing to expand, would likely be regulated by the Nevada Public Utilities Commission, which would allow TMWA to participate in proceedings. When new systems or expansions are proposed, regional consistency throughout TMWA's possible future service area

(i.e., hydrographic basins where TMWA has facilities) would ensure standardized facilities in case of eventual requests for service or acquisition.

### **Proposed Action Items**

9.1.1.A. Coordinate with TMWA on the development of possible policy recommendations to local governments regarding standards for the creation of new water systems and expansion or acquisition of existing water systems within municipal boundaries.

### **Relevant Planning Documents**

- Washoe County Development Code, Article 422.

### **9.1.2 South Truckee Meadows**

#### **Specific Issues and Linkages**

In 2002, Washoe County through the Regional Water Planning Commission (“RWPC”), WCDWR and STMGID, completed an update to the water facility plans for the South Truckee Meadows. The *South Truckee Meadows Facility Plan* (ECO:LOGIC, 2002a) provides a comprehensive water supply plan for build-out of the planning area, which encompasses an area stretching from just north of Double Diamond Ranch south to Pleasant Valley, east to the Virginia Foothills and west to Galena Forest.

The major goals of the Facility Plan were to:

- Utilize the creek resources to their highest and best beneficial uses, and balance beneficial municipal and industrial (“M&I”) uses with in-stream flow requirements for recharge, wildlife, riparian habitat, aesthetics and quality of life;
- Ensure that recommended plans for water supplies and facilities conform to regional wastewater disposal/water quality requirements at the South Truckee Meadows Water Reclamation Facility (“STMWRF”) and Truckee Meadows Water Reclamation Facility (“TMWRF”); and
- Promote conjunctive use and expand reclaimed water service to maximize the efficient use of water resources and facilities.

### **Alternatives Evaluated to Address the Issues**

After consolidation, TMWA began planning for conjunctive use management of surface water and groundwater in the upper Mt. Rose and Galena Fan areas due to the complete dependence on groundwater and the continued decline in water levels aggravated by the ongoing drought. With the full resources of the consolidated water utility available, immediate construction of the necessary facilities has begun. This will improve reliability for both TMWA customers and domestic well owners by mitigating the continued decline of groundwater levels in the area.

TMWA is implementing a \$7.8 million conjunctive-use plan for the Mt. Rose/Galena Fan area, consisting of three projects which will provide the ability to deliver treated surface water from the Truckee River to the area:

- Arrowcreek/Mt. Rose Conjunctive-Use Facilities;
- Expanded Conjunctive-Use Facilities/Aquifer Storage and Recovery (“ASR”) Program; and
- STMGID Conjunctive-Use Facilities.

The Arrowcreek/Mt. Rose Conjunctive-Use Facilities, Phase 1 will deliver up to 1,500 gallons per minute (“gpm”) of surface water primarily during the winter months allowing TMWA to avoid pumping its production wells in the Arrowcreek and Mt. Rose water systems.

TMWA is also expanding its fall, winter and spring ASR in this area starting with the Arrowcreek 2, Tessa West and Mt Rose 3 wells. Phase 2 of the Arrowcreek/Mt. Rose conjunctive-use facilities, scheduled to be constructed in 2016-2017, consists of system improvements that will allow delivery of surface water into the upper portions of the Mt. Rose/Galena water system for use in recharging additional wells.

The STMGID Conjunctive-Use Facilities will provide surface water mainly during the winter for an area primarily of former STMGID customers located near the Saddlehorn neighborhood. A new pipeline in Arrowcreek Parkway and a new booster pump will be constructed in 2017-2018, benefiting TMWA customers and domestic well owners by providing surface water to protect and restore groundwater resources.

Newly adopted rules and water service facility charges for the Mt. Rose/Galena Fan area affecting new development, along with existing TMWA water rights dedication rules, require developers in this area to dedicate supplemental surface water (creek) supplies when dedicating groundwater for new service in the area. Supplemental surface water resources (Whites, Thomas and/or Galena creeks) are a key component of the conjunctive resource management plan and necessary to ensure a sustainable water supply for existing customers, domestic well owners and new development in these areas.

In order to develop supplemental surface water supplies that will provide for the long term sustainability of the local groundwater aquifer, TMWA is implementing a plan to construct a small water treatment plant off of Whites and Thomas Creeks. Plans for this upper treatment plant were approved as part of the 2002 South Truckee Meadows Facility Plan, which recognized that “The upper treatment plant is an integral component of the recommended water supply plan. Most importantly, it will provide recharge water and/or offset winter groundwater pumping in the upper Mt. Rose fan area.”

### **Proposed Action Items**

9.1.2.A Develop tributary creek water for municipal supply by way of the Mt Rose Water Treatment Plant, continue the tributary creek water exchange program and investigate other options to improve the beneficial uses of the tributary creek resources.

9.1.2.B Support TMWA’s Plan for Groundwater Sustainability on the Mt Rose Fan to mitigate future groundwater level declines and potential impacts to domestic wells.

### **Relevant Planning Documents**

- 2016-2035 WRP;



- ECO:LOGIC, 2009a, *South Truckee Meadows Water Facility Plan Update*, prepared for WCDWR; and
- ECO:LOGIC, 2002a, *South Truckee Meadows Facility Plan*, prepared for the RWPC, WCDWR, and South Truckee Meadows General Improvement District.

### **9.1.3 Stead/Lemmon Valley**

#### **Specific Issues and Linkages**

The WCDWR *2009-2028 Draft North Valleys Water Facility Plan* (ECO:LOGIC, 2009) identified the water resources necessary to serve the former Washoe County (now TMWA) service areas. These supplies are fully developed (local groundwater, imported Truckee River water, and imported Fish Springs Ranch groundwater) and TMWA has developed the infrastructure necessary to distribute these water supplies. TMWA has also developed plans for water facilities to supply Fish Springs water to Cold Springs Valley to the west. The 2035 Regional Water Balance identifies a water supply imbalance between the two basins that will need to be addressed over the long term (see Cold Springs, below).

Wastewater and storm water linkages:

- Importation of a new water supply into the Lemmon Valley hydrographic basin would result in the generation of additional effluent and storm water run-off volume in this closed basin.

#### **Relevant Planning Documents**

- 2016-2035 WRP; and
- ECO:LOGIC, 2009b, *2009-2028 Draft North Valleys Water Facility Plan*, prepared for WCDWR.

### **9.1.4 Cold Springs**

#### **Specific Issues and Linkages**

The demand for potable water supplies in Cold Springs will be met in the future using a combination of local groundwater resources, augmented with imported water supplies, such as the Fish Springs and Intermountain water importation projects. The 2035 Regional Water Balance identifies a water supply imbalance in both Cold Springs and Lemmon Valleys that will need to be addressed over the long term. In particular, the combined demand from domestic wells and permitted municipal groundwater pumping exceeds the perennial yield of the Cold Springs basin. This is an issue that affects both existing and future water users and exists under both current and projected 2035 conditions.

Plans have been developed for proposed TMWA water facilities to integrate with the existing Utilities Inc. water system. Potential infrastructure savings could be realized with a conjunctive use operation of the two water systems.

Wastewater and storm water linkages:

- Nitrate contamination of groundwater has been observed in areas with high densities of septic tanks. The *1995-2015 Regional Water Plan* expressed concern over continued installation of septic tanks in this hydrographic basin.
- Importation of a new water supply into the Cold Springs hydrographic basin would result in the generation of additional effluent and storm water run-off volume in this closed basin.

**Alternatives Evaluated to Address the Issues**

- New development in Cold Springs is designed to minimize water consumption in order to extend the available water resources as far as possible;
- TMWA has developed plans for water facilities to supply Fish Springs Water Importation Project water to Cold Springs Valley via a proposed wholesale agreement with Utilities Inc.;
- A Cold Springs developer has consulted with hydrology staff to determine the sustainable yield of the existing and proposed Utilities Inc. production wells; and
- The potential future water demands associated with development in Cold Springs were included in 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, 2007a), and the 2035 Regional Water Balance presented in Section 6.3.

Water resource management options are available to help mitigate the potential negative impacts due to the long-term imbalance. For instance:

- A portion of the supply from the Fish Springs Water Importation Project could be used to serve new growth.
- Conversion of domestic wells to the municipal water system, (municipal water systems are able to utilize and manage the groundwater resources more efficiently).
- Expanded groundwater recharge utilizing available water resources from basins with surplus water.
- Consider integrating plans for proposed facilities with the existing Utilities Inc. water system. Potential infrastructure savings could be realized with a conjunctive use operation of the two water systems.
- Consider expanded uses of reclaimed water, such as for groundwater recharge, to offset future potable water demands.

**Subsequent Activities and Additional Work Needed**

9.1.4.A Develop a facility plan for the build-out of approved land uses in the Cold Springs portion of the TMSA, including conjunctive use and system integration options with Utilities Inc.

## Relevant Planning Documents

- ECO:LOGIC, 2010a, *North Valleys Initiative: Advancing Solutions to Regional Water Issues*, prepared for the NNWPC.
- ECO:LOGIC, 2007a, *City of Reno and Washoe County TMSA/FSA Water, Wastewater and Flood Management Facility Plan*, prepared for the City of Reno, Washoe County and RWPC.
- ECO:LOGIC, 2005a, *Fish Springs Ranch Facility Plan*.
- ECO:LOGIC, 2002b, *North Valleys Water Supply Comparison*, prepared for the RWPC.
- JBR Environmental Consultants and Montgomery Watson, 1997, *Water Supply Alternatives Evaluation for the North Valleys*, prepared for the Washoe County Department of Comprehensive Planning.

### 9.1.5 Spanish Springs

#### Specific Issues and Linkages

Spanish Springs Valley includes water service areas within the jurisdictions of Sparks and Washoe County. Demands are served by TMWA from a combination of Truckee River water, Truckee Meadows groundwater and Spanish Springs groundwater pumped from TMWA wells managed as part of TMWA's overall resource management plan. TMWA began aquifer storage and recovery operations in Spanish Springs in 2008 and increased the volume of water stored each successive year. In 2015, 1,055 af here stored.

- Issues identified in the *1995-2015 Regional Water Plan* (RWPC, 1997), the *2004-2025 Regional Water Plan* (RWPC, 2005), the *Spanish Springs Valley Groundwater Budget Analysis* (ECO:LOGIC, 2004a), and the *City of Reno and Washoe County TMSA/FSA Water, Wastewater and Flood Management Facility Plan* (ECO:LOGIC, 2007a) were related to future water demands as a result of possible growth in the unincorporated area, water quality impacts due to existing growth and diminishing groundwater recharge. Allocation of groundwater resources in Spanish Springs had resulted in a situation where water rights and cumulative groundwater pumping by all entities exceeded the perennial yield of groundwater resources. Land use changes from irrigated agriculture to residential, commercial and industrial uses had resulted in reduction of recharge occurring from surface water irrigation via the Orr Ditch, which had potentially exacerbated groundwater deficits.

Linkages: Nitrate contamination of groundwater because of septic tank density.

#### Alternatives Evaluated to Address the Issues

A number of actions have been taken to manage water resources for long-term sustainability in the Spanish Springs Valley. WCDWR began implementation of a strategy developed in a series of reports and plans from 2004 to 2007 to address water rights and groundwater pumping imbalances by decreasing reliance on groundwater and using more water resources imported from the Truckee Meadows basin. Most recently, in December 2014, Washoe County's water utility was consolidated into TMWA. Coordination of stakeholders within the basin is key to the

success of a long-term groundwater management strategy. A brief chronology of alternatives and actions appears below.

- In 1996, WCDWR adopted policies requiring the dedication of water rights when new parcels are created via the parcel map process in an effort to better balance water rights and water resources and enable future mitigation of possible water level declines.
- In 1997, the United States Geological Survey developed a groundwater model of the Spanish Springs hydrographic basin detailing the sources and quantity of the groundwater resource.
- In 2002, WCDWR developed a multi-faceted plan for the management of nitrates in the aquifer, including conversion of septic tanks to the sewer system as funding becomes available.
- In 2003, the RWPC developed water policies seeking to ensure that new commitments against the groundwater resource do not exceed the sustainable yield.
- WCDWR prepared the 2004 *Spanish Springs Water Facility Plan*, a comprehensive plan that identifies the water resources and infrastructure required to serve build-out of approved land uses in the unincorporated area.
- The RWPC sponsored preparation of the 2004 *Orr Ditch Recharge Study* that includes long-term water balance and management strategies for the Spanish Springs hydrographic basin.
- In 2006, WCDWR entered into a wholesale agreement for importation of 3,000 af annually (“afa”) of TMWA resources to serve future growth in the unincorporated area.
- In 2006, Sparks extended TMWRF reclaimed water infrastructure far into the valley, enabling the use of reclaimed water to offset demands on the municipal water system.
- In 2007, WCDWR completed Phase 1A of the Spanish Springs Phased Sewer Project, which converted 211 residential units and an elementary school from septic systems to community sewer for protection of groundwater quality.
- TMWA and WCDWR completed construction of interties at Canoe Hill, Campello and Lazy Five Parkway and WCDWR implemented conjunctive use of groundwater and imported water by way of these interties.
- In 2009, WCDWR integrated the Desert Springs, Spring Creek and Spring Creek East water systems into a single system for operational flexibility and reliability.
- In December 2014, WCDWR’s water utility was consolidated into TMWA.
- In 2015, based on permits issued by the Nevada Division of Environmental Protection (“NDEP”) and State Engineer, TMWA recharged 985 af in its Hawkins Court Well and 70 af into its Desert Springs 4 well.
- In 2017, TMWA will initiate pilot water treatment efforts for removal of nitrate and arsenic from groundwater.

## Subsequent Activities and Additional Work Needed

9.1.5.A Monitor groundwater pumping and aquifer water levels to avoid long-term over-pumping. Use Truckee River water resources for conjunctive use and mitigation of water quality issues. Support TMWA's pilot water treatment efforts for removal of nitrate and arsenic from groundwater.

9.1.5.B Continue implementing phased conversion of areas with high densities of septic tanks to community sewer system as funding is made available.

## Relevant Planning Documents

- AMEC, 2000, *Sparks Effluent Pipeline Extension*, prepared for City of Sparks.
- ECO:LOGIC, 2007a, City of Reno and Washoe County TMSA/FSA Water, Wastewater and Flood Management Facility Plan, prepared for the City of Reno, Washoe County and RWPC.
- ECO:LOGIC, 2007b, Spanish Springs Water Facility Plan Update, prepared for WCDWR.
- ECO:LOGIC, 2004b, *Orr Ditch Recharge Study*, prepared for RWPC.
- ECO:LOGIC, 2004a, *Spanish Springs Water Facility Plan*, prepared for WCDWR.
- RWPC, 2005, 2004-2025 Washoe County Comprehensive Regional Water Management Plan.
- RWPC, 1997, 1995-2015 Washoe County Comprehensive Regional Water Management Plan.
- TMWA, 2010, Report on Aquifer Storage and Recovery, Spanish Springs Valley Hydrographic Basin, Jan 1 through June 30, 2010.
- TMWA, 2003, *2005–2025 Water Resource Plan*.
- United States Geological Survey, 1997, Hydrogeology and Simulated Effects of Urban Development on Water Resources of Spanish Springs Valley, Washoe County, West-Central Nevada, Water Resources Investigations Report 96-4297.
- WCDWR, 2002, *Spanish Springs Valley Nitrate Occurrence Facility Plan*, prepared for the Nevada Division of Environmental Protection.

### 9.1.6 Tracy Segment (Lower Truckee River)

#### Specific Issues and Linkages

Industrially zoned lands in both Washoe and Storey County are concentrated in the Mustang, Patrick/Tracy and USA Parkway areas. In Washoe County, TMWA operates the East Truckee Canyon water system which serves a commercial/industrial area near Mustang along Interstate 80. TMWA also operates the Stampmill water system approximately 1.5 miles west of Wadsworth which serves a small 45-unit residential development. The Reno Technology Park Water

Company operates two large wells and currently serves one large industrial customer (Apple data center) east of Reno near Tracy.

In Storey County, the Tahoe Reno Industrial Center (“TRI Center”) encompasses a developable 30,000-acre industrial complex with pre-approved industrial and manufacturing uses. Water service is provided by the TRI General Improvement District. In addition, TRI Center is seeking the use of up to 4,000 afa of TMWRF reclaimed water which would be used for cooling and other industrial purposes. No decisions regarding the provision of reclaimed water to TRI Center have been made at this time.

Linkages: Water rights, reclaimed water usage and TMWRF’s near-term effluent management strategy development. Joint water supply planning and facility sharing with TRI Center and Storey County may reduce overall costs and infrastructure requirements.

### **Alternatives Evaluated to Address the Issues**

Water resources and facility planning for industrial development along the lower Truckee River will require continued evaluation of complex water rights, facility and reclaimed water availability issues.

### **Proposed Action Items**

9.1.6.A Continued evaluation of reclaimed water management options, including TMWRF’s near-term effluent management strategy development and water rights coordination for existing reclaimed water commitments and future potential demands.

9.1.6.B Coordination with TRI Center and Storey County regarding future potential demands for the entire Tracy Segment hydrographic basin.

### **Relevant Planning Documents**

- AGRA Infrastructure, 2000, Water and Wastewater Facility Plans on Industrial Zoned Lands Along the Lower Truckee River within Washoe County, prepared for RWPC.
- Stantec Consultants, 2008, City of Sparks TMSA/FSA Conceptual Facility Master Plan

### **9.1.7 Truckee Canyon (Verdi)**

#### **Specific Issues and Linkages**

The Boomtown water system is proposing an expansion to service new residential and commercial development. The additional demand would increase Boomtown’s groundwater pumping to approximately 400 afa. Taking into consideration the planned development in the Verdi area, the long-term sustainable yield of the Verdi area groundwater resource is uncertain, and it is not known whether the long-term yield is sufficient without creating “unreasonable adverse effects” to neighboring domestic wells.

Presently, the Verdi area relies solely on groundwater. The Truckee River dominates the water resources of the Verdi basin, with two perennial streams, Dog Creek (Verdi Range) and Roberts Creek (Carson Range) tributary to the river as are minor ephemeral streams. Canal diversions from the Truckee River, used for power generation, result in no net loss to the river. Historically, leakage occurred from the Verdi Power Canal. However, this leakage has been substantially

reduced, and what leakage does occur generally returns to the river. The Steamboat Ditch diverts Truckee River water for irrigation to the Truckee Meadows and loses some water to infiltration and riparian vegetation. Wastewater disposal is provided by individual septic systems, a small private wastewater treatment system serving Gold Ranch and municipal sewer service to TMWRF provided to the Boomtown commercial area and Verdi Meadows residents by the City of Reno.

Historically, Washoe County conducted water well measurements on 156 wells, mostly domestic, during the period of 2002 – 2007. From these measurements and study of lithologic logs, two aquifer systems are indicated (HYDRO-GEO Consulting Services, Ltd, 2016): an alluvial aquifer coincident with the Truckee River corridor and a fractured volcanic aquifer that is coupled to the alluvial aquifer. Data throughout the basin consistently indicates that the piezometric level in the volcanic aquifer is lower than the river, but varies considerably and at times rises above land surface under artesian pressure. Annual fluctuations of 60-80 feet have been measured in this aquifer. Water levels in the alluvial aquifer are generally very stable in elevation throughout the year and are at or above the river elevation by a few tens of feet, indicating a groundwater gradient towards the river.

The Verdi basin also has drinking water quality problems for arsenic, iron, manganese and hydrogen sulfide. The arsenic, iron and manganese constituents are derived from volcanic rocks and the hydrogen sulfide from poor grade lignite deposits within the lower sections of the Tertiary sediments.

### **Alternatives Evaluated to Address the Issues**

The Boomtown water system is an independent water system not associated with TMWA. TMWA expects the initial phases of the residential and commercial development to be served by the existing Boomtown water system without interconnection to TMWA. However, as demands increase over time, the capacity of the Boomtown water system will be reached, and a new surface water supply will be needed. TMWA has developed a long-range water facility plan for providing service to the Verdi area. The facility plan contemplates assimilation of several small private water systems and potentially the Boomtown water system into the TMWA system, with the addition of a series of pump stations, pipelines, and tanks as presented in Table 9-1. Conceptually, water supply to the Verdi area would follow TMWA's conjunctive use operating strategy, with baseload demands supplied from TMWA's existing surface water treatment plants, and summertime peaking capacity provided by the Boomtown wells.

**Table 9-1 Verdi Backbone Water Facility Requirements**

	<b>Dia. (inches)</b>	<b>Length (feet)</b>	<b>Total Cost</b>
Previous Expenditures			\$2,140,600
US 40 Pump Station Expansion			\$450,000
24" Mayberry River Xing	24	1700	\$912,000
16" Mogul Parallel Mains	16	6060	\$1,954,200
	20	480	\$202,000
Verdi #1 Pump Station			\$1,500,000
Verdi #1 PS Discharge Mains	18	7640	\$2,750,400
	18	4800	\$1,728,000
Lower Verdi Tank & Feeder Main	18	5400	\$3,055,200
	12	3500	\$672,000
			<b>\$15,364,400</b>

Facility cost estimates do not include interest carrying charges that have yet to be determined.

In the short term, TMWA proposes to construct an 18-inch transmission main from the terminus of the planned West Meadows development under the Truckee River to the vicinity of Riverbelle, including improvements to the Mogul pump station. These improvements will provide up to 200 gpm of maximum day demand available to the Verdi area and/or the Boomtown water system. Additional groundwater modeling and water level monitoring will be needed to address the uncertainty associated with the long-term sustainable yield of the Verdi area groundwater resource as the area develops.

### Proposed Action Items

9.1.7.A. Coordinate with public and private water purveyors and developers regarding water resources, existing commitments and future potential demands for the Truckee Canyon hydrographic basin.

### Relevant Planning Documents

- HYDRO-GEO Consulting Services, Ltd, 2016: Assessment of Groundwater Resources in the Verdi Area, emphasizing the Boomtown Water System. Consultant report prepared for TMWA, Reno NV.
- TMWA 2030 Facility Plan.

### 9.1.8 Groundwater Resource Development and Impact to Domestic Wells

#### Specific Issues and Linkages

- A number of domestic wells have failed in two locations within the planning area because of declining water table elevations: Heppner Subdivision in north Lemmon Valley and the Mt. Rose Fan / Callahan Ranch area of the southwest Truckee Meadows. In a third location, Golden Valley, domestic wells have experienced water level declines in addition to septic system related water quality deterioration.
- Several factors can affect domestic wells including drought conditions and the natural variability of annual aquifer recharge, domestic well density, hydrogeologic conditions



such as fractured rock aquifers having poor yields, inadequate aquifer penetration at initial construction, age and condition of the domestic well, and municipal groundwater pumping.

- Converting properties with domestic wells to municipal water supply is costly.
- Uncertainty and disagreement commonly exist regarding responsibility for resolving water supply issues in areas where municipal production wells co-exist with domestic wells.
- State water law recognizes the importance of domestic wells as appurtenances to private homes and creates a “protectable interest” to protect their water supply from unreasonable adverse effects caused by municipal, quasi-municipal or industrial uses which cannot be reasonably mitigated (Nevada Revised Statutes [“NRS”] 533.024.2(b)).
- State water law allows the State Engineer to prohibit the drilling of domestic wells in areas where water can be furnished by an entity such as a water district or a municipality presently engaged in furnishing water to the inhabitants thereof (NRS 434.120.3(d)).

Linkages: Conjunctive use of surface water and groundwater resources.

### **Alternatives Evaluated to Address the Issues**

- The Golden Valley Recharge Project enhances water resources available to domestic wells.
- South Truckee Meadows Facility Plan for conjunctive use of surface and groundwater resources includes a limitation on overall groundwater pumping from municipal wells that considers impacts to domestic wells.
- TMWA provides opportunities for domestic well owners to deepen their existing wells or connect to the existing municipal water system in the Mt Rose Fan Domestic Well Mitigation Program area.
- WCDWR (now TMWA) is using federal grant funds to offer reduced connection fees to Heppner Subdivision domestic well owners wishing to connect to the existing municipal water system.
- Following the consolidation of public purveyors, TMWA developed plans to expand its system to provide Truckee River resources to areas formerly served by groundwater, e.g., the Mt. Rose Fan and Verdi areas. Additionally, TMWA is pursuing conjunctive use program that includes the proposed Mt. Rose Water Treatment Plant, discussed briefly in Section 9.1.2.

### **Proposed Action Items**

9.1.8.A. Support expansion of TMWA’s Truckee River system to reach areas such as the Mt. Rose Fan and Verdi, to allow for conjunctive use. TMWA’s aquifer storage and recovery program provides secondary benefits to domestic wells locally, such as in Lemmon Valley. Indirect potable reuse may provide future benefits.

9.1.8.B Support TMWA’s Plan for Groundwater Sustainability on the Mt. Rose Fan to mitigate future groundwater level declines and potential impacts to domestic wells.

## Relevant Planning Documents

- ECO:LOGIC, 2002a, *South Truckee Meadows Facility Plan*, prepared for the RWPC, WCDWR, and South Truckee Meadows General Improvement District.
- RWPC Groundwater Task Force, 2003, Final Report to the RWPC by the Groundwater Task Force.
- 2016-2035 WRP.
- TMWA 2030 Facility Plan.

## 9.2 Water Conservation

### Specific Issues and Linkages

Chapter 7 describes the benefits of water conservation and characterizes the development of water conservation efforts over time since the 1997 adoption of the initial Regional Water Management Plan. Important events affecting water conservation that have taken place since that time include:

- Full metering;
- Revisions to NRS 540.141;
- Consolidation;
- TROA implementation; and
- Governors Drought Forum.

In December 2014 Washoe County water utility and STMGID were consolidated into TMWA, expanding TMWA's customer base to about 90 percent of the Washoe County population. The 2016-2035 WRP includes a comprehensive water conservation plan that addresses each of the events listed above.

A summary of conservation issues in Chapter 7 includes the following:

- Under existing regulatory and legal constraints, water that is not diverted from the Truckee River as a result of conservation is left in the river, stored upstream in reservoirs for use during droughts or for fish and wildlife purposes, or used to recharge groundwater. This conserved water is not available to supply additional growth.
- The *1995-2015 Regional Water Plan* developed a "Base Case" conservation plan that included a suite of seven conservation measures to be implemented in the five-year timeframe following plan adoption. Conservation measures proposed included new building practices, showerhead retrofit, toilet retrofit, landscape efficiency conservation, good earth-keeping, increasing block water rates, and water meter retrofit. Although potable water demand projections used as the basis for the Base Case conservation have been revised using recent data, amendments to the *Regional Water Plan* in 2005 and 2009 state that the pursuit of Base Case conservation is desirable and beneficial to the planning area. In addition to monitoring water conservation progress, the *Regional Water Plan* will continue to evaluate whether existing conservation programs are effective and practicable, and whether programs should be added or deleted.

- In 2004, TMWA's Technical Advisory Committee formed a Landscape Subcommittee to address increasing customer complaints about landscape standards approved by the local governments and the lack of consistent enforcement of the water conservation elements of the ordinances. The subcommittee, comprised of three voting members representing Reno, Sparks and Washoe County, developed findings and recommendations regarding landscape ordinances (see Appendix H). The RWPC staff participated in the development of the recommendations. TMWA and RWPC staff presented the final report to the Reno City Council, Sparks City Council and Washoe County Board of Commissioners at a joint meeting in 2005. At that meeting, the governing boards directed their respective staffs to prepare code amendments to address the findings and recommendations. The RWPC considered enforcement of the entities' landscaping ordinances to be a major objective and included this in the 2009 amendment to the *Regional Water Plan*. The RWPC also recommended working with the local entities and water purveyors on updating their landscaping ordinances, encouraging them to incorporate water efficiency design features for commercial and residential landscapes.

### **Action Taken/Alternatives Evaluated to Address the Issues**

Conservation measures that have been implemented include:

- Conservation ordinances have been adopted by all three local governments. In 2005, the RWPC, in cooperation with TMWA, reviewed the most current landscaping ordinances and provided local governments with recommendations to update landscaping ordinances to further promote water efficiency design features for new commercial and residential developments.
- Evapotranspiration ("ET") weather station and irrigation controller studies have been completed.
- TMWA has implemented an inverted block rate structure.
- TMWA connections are over 96 percent metered.
- The toilet retrofit program has been completed.
- TMWA has implemented a multi-faceted public awareness and education program, including water use review, landscape efficiency and three-day per week assigned day watering.
- TMWA has been granted authority to enforce water-wasting regulations.
- Local governments have adopted new building codes.
- Various public education and professional development programs have been implemented, such as the Certified Landscape Technician Exam and Washoe ET Website.
- Expansion of the reclaimed water system to offset demands on potable water supplies.

Although Base Case conservation measures have been effectively implemented, Chapter 7 includes an extensive listing of additional conservation measures that could also be implemented for additional water savings.

The 2009 amendment to the *Regional Water Plan* recommends continuing to work with the local governmental entities and water purveyors on updating their landscape codes, and encouraging them to incorporate water efficiency design features for commercial and residential landscapes.

### **Subsequent Activities and Additional Work Needed**

9.2.A Revise Chapter 7 and “Base Case” conservation for consistency with the 2016-2035 WRP, Chapter 5, which is tied to drought, Floriston Rates and TROA.

9.2.B Support and participate in the Water For The Seasons program, led by UNR, which investigates climate variability and potential water supply risks.

9.2.C. Continue long-term regional precipitation gauge monitoring and data analysis.

### **Relevant Planning Documents**

- Carlos, W. J., Miller, W., Devitt, D. A., Fernandez, G., 2004, *Evapotranspiration Satellite Irrigation Controller Study*.
- RWPC, 1997, 1995 – 2015 Washoe County Comprehensive Regional Water Management Plan.
- TMWA, 2009, 2030 WRP.
- Volt VIEWtech, 2003, Ultra Low Flush Toilet Rebate Program Final Report. Prepared for the RWPC.

## **9.3 Wastewater Management**

### **9.3.1 Central Truckee Meadows**

#### **Specific Issues and Linkages**

TMWRF provides centralized wastewater treatment for most of the community, including development in the central Truckee Meadows and portions of adjoining basins. To meet National Pollutant Discharge Elimination System (“NPDES”) permit requirements for discharge to the Truckee River, TMWRF must achieve balance between treatment process improvements, reclaimed water needs and water rights requirements, Truckee River water quality, and various other inter-related, regional water management objectives.

TMWRF has a permitted capacity of 44 million gallons per day (“MGD”), an actual capacity of 40 MGD, and currently operates at about 26 MGD. The actual maximum-month-flow design capacity of 40 MGD is due to increased biological oxygen demand wastewater strength resulting from indoor water conservation (low flow fixtures and water meters) and inflow and infiltration reduction. Despite the decrease from 44 to 40 MGD, the revised flow capacity accommodates 110 percent of the Phase III expansion design population (approximately 433,000 versus 398,000) because the actual flow per residential unit is less than historical flow rates.

During the irrigation season, typically April through October, up to approximately 4,500 af of TMWRF reclaimed water is pumped to reuse sites in Reno and Sparks. TMWRF also serves as a regional biosolids facility, treating waste activated sludge from the Reno-Stead Water

Reclamation Facility (“RSWRF”). TMWRF has an estimated replacement value of at least \$500 million.

Following is a concise listing of the key issues concerning TMWRF. Chapters 4 and 6 include more extensive discussions of these issues. Chapter 4 also includes further information on watershed management programs aimed at protecting water quality.

- Constraints on discharge to the Truckee River due to NPDES discharge permit requirements related to nutrient and total dissolved solids (“TDS”) water quality standards and total maximum daily loads (“TMDLs”) for the Truckee River.
- Truckee River water rights dedications to meet return flow requirements may be needed for the possible future expansion of reclaimed water use, such as irrigation, year-round industrial use of reclaimed water possibly outside the TMSA, groundwater recharge and/or indirect potable reuse. Water rights dedications are also necessary to maintain Truckee River in-stream flows and improve water quality, and for many other purposes. Section 9.5 addresses the integrated use of water rights.

### **Alternatives Evaluated to Address the Issues**

#### *Enhanced Nitrogen Removal Planning Study*

In 2013, following an upset at TMWRF resulting in a nitrogen discharge violation, the WRWC funded the Enhanced Nitrogen Removal Planning Study conducted by Carollo Engineers. The final Technical Memorandum prepared for the City of Reno identified three treatment technologies, one of which may be selected to supplement existing nitrogen treatment at TMWRF: enhanced coagulation; advanced oxidation; and reverse osmosis (“RO”). Additional evaluations of enhanced nitrogen removal technologies are ongoing.

#### *Near-Term Effluent Management Strategy Development*

The near-term effluent management issues focus on reducing the nitrogen load to the Truckee River by maximizing the use of TMWRF reclaimed water at locations away from the river in allowable quantities and during appropriate times of the year, while maintaining a balance with Truckee River flows consistent with State water law and TROA. A variety of alternatives and scenarios are being evaluated using population and employment growth projections to estimate wastewater flow increases over time. Alternatives include an intertie pipeline to Huffaker Reservoir, effluent reuse outside the TMWA, aquifer recharge and indirect potable reuse using effluent treated to exception quality standards.

#### *Exceptional Quality Reclaimed Water Feasibility Study*

The Regional Effluent Management Team briefly discussed in Section 4.3 is jointly developing a feasibility study to evaluate whether the State of Nevada’s proposed “exceptional quality” standard for reclaimed water offers regional long-range water supply resiliency benefits. Criteria for exceptional quality reclaimed water, achieved through a series of advanced water treatment and natural processes, are included in proposed draft State regulations to permit the use of reclaimed water for groundwater augmentation. The Team envisions a 5-year feasibility study that consists of multiple elements including social, environmental and financial analyses, regulatory compliance, public engagement, advanced treatment pilot testing, geotechnical investigations, and field scale treatment demonstration projects.

Downstream river restoration work will help restore the river ecosystem, flood plain, increase the nutrient assimilative capacity of the river and improve water quality.

High-level regional plans for wastewater infrastructure improvements to provide for the future needs of the Planning Area's service providers were completed in late 2007 and early 2008: the *City of Reno and Washoe County TMSA/FSA Water, Wastewater and Flood Management Facility Plan* (ECO:LOGIC, 2007a) and the *City of Sparks Conceptual Facility Master Plan* (Stantec, 2008). These facility plans remain valuable regional planning-level compilations.

### **Proposed Action Items**

9.3.1.A Continue development of near-term regional strategies to manage effluent and reduce nitrogen loading to the Truckee River, which may include additional treatment, expanded distribution of effluent within or outside the TMSA, and expanded uses which may include aquifer recharge and indirect potable reuse.

9.3.1.B Pursue connection of additional reclaimed water users to the existing systems in Sparks, Reno and Washoe County consistent with regional water quality and water rights considerations, and continue investigating the feasibility of expanded uses of reclaimed water.

9.3.1.C Continue evaluating the merits of regional integrated solutions between TMWRF and STMWRF for wastewater treatment and effluent reuse and disposal.

### **Relevant Planning Documents**

- Buzzzone and Svetich, October 9, 2009, Truckee River Total Maximum Daily Load, presentation to the WRWC.
- ECO:LOGIC, 2007a, City of Reno and Washoe County TMSA/FSA Water, Wastewater and Flood Management Facility Plan, prepared for the City of Reno, Washoe County and RWPC.
- Kennedy/Jenks Consultants and Stantec Consulting Engineers, 2005, *Spanish Springs Valley Water Reclamation Facility Plan*.
- PLPT, 2001, *Water Quality Control Plan*.
- Stantec, 2008, *City of Sparks Conceptual Facility Master Plan*, prepared for the City of Sparks and RWPC.
- Stantec, 2015, TMWRF/Huffaker Reservoir Effluent Interconnection Pipeline Evaluation, prepared for the City of Reno.

### **9.3.2 South Truckee Meadows**

#### **Specific Issues and Linkages**

WCCSD operates STMWRF, which provides service primarily for the Double Diamond and Damonte Ranch areas of Reno, and unincorporated Washoe County including the Virginia Foothills and Mt. Rose fan. STMWRF is one of the few water reclamation facilities in the United States relying exclusively on effluent reuse for disposal of the treated wastewater. Presently, sludge is treated and dewatered onsite and transported by truck for landfill disposal.

The 2035 Regional Water Balance presented in Chapter 6, projects wastewater flows of approximately 7,700 af. The planned STMWRF expansion to six MGD will be required to handle the projected flows within the 20-year planning horizon, but is not anticipated to be needed within the next five to 10 years. The 2035 Regional Water Balance identifies a roughly 4,400 af deficit in effluent reuse/disposal capacity. Additional reuse sites and/or new reuse practices will need to be developed to address the projected deficit and use all of the reclaimed water expected to be produced within the 20-year planning horizon.

### **Alternatives Evaluated to Address the Issues**

STMWRF is permitted to treat a maximum month average day flow of 4.1 MGD, expandable to a capacity of 6.0 MGD. Huffaker Reservoir, used to store reclaimed water, was constructed in 1988 and has a capacity of approximately 4,000 af. Reservoir lining to stem seepage losses was completed in 2015. Washoe County completed an updated 20-year facility plan in 2016 with assistance from Carollo Engineers and a capital improvement plan identifying sanitary sewer interceptor and wastewater treatment improvements was produced. The plan identifies improvements needed for repair and replacement, upgrades to meet permit requirements, and additional capacity for anticipated growth. Infrastructure improvements will be phased over the next 20-years.

CH2M Engineers assisted Washoe County to prepare a complimentary 20-year facility plan looking specifically at South Meadows reclaimed water system improvements, which include reclaimed water transmission piping, water storage and treatment facilities, and new locations for reclaimed water use.

The Regional Effluent Management Team, discussed briefly in Section 4.3, continues to develop regional strategies to address near-term and longer range effluent management issues in the Planning Area.

Plans for wastewater infrastructure improvements for the future needs of the Planning Area's service providers resulted in the *City of Reno and Washoe County TMSA/FSA Water, Wastewater and Flood Management Facility Plan* (ECO:LOGIC, 2007a) and the *City of Sparks Conceptual Facility Master Plan* (Stantec, 2008).

Based on the 2035 flow projections from the Regional Water Balance presented in Chapter 6, roughly 4,400 af of additional disposal capacity will be required when STMWRF is expanded to six MGD. However, expansion to 6 MGD is not anticipated to be needed within the next five to 10 years.

### **Proposed Action Items**

9.3.2.A Actively pursue a new reclaimed water strategy to continually balance the increasing supply with available storage capacity and demand. Alternative reuse methods should be explored in detail, in coordination with the NDEP, such as reclaimed water aquifer recharge and cooling water for energy generation facilities.

9.3.2.B In regard to the potential regional implications of indirect potable reuse and aquifer recharge, it is recommended that the Reno Stead ozone-biological activated carbon pilot plant feasibility evaluation be continued at STMWRF to more fully optimize the technology.

9.3.2.C As discussed in Section 9.3.1, continue evaluating the merits of regional integrated solutions between TMWRF and STMWRF for wastewater treatment and effluent reuse and disposal, including funding considerations.

### **Relevant Planning Documents**

- CH2MHill/Stantec, 2008, Draft Facility Plan Update, STMWRF 6-MGD Expansion Project.
- ECO:LOGIC, 2007a, City of Reno and Washoe County TMSA/FSA Water, Wastewater and Flood Management Facility Plan.
- Stantec Consultants, 2008, City of Sparks TMSA/FSA Conceptual Facility Master Plan.
- Carollo, 2016, STMWRF Facility Plan, prepared for Washoe County.
- CH2M Engineers, 2016, South Truckee Meadows Reclaimed Water System Improvements Facility Plan, prepared for Washoe County.

### **9.3.3 Stead/Lemmon Valley**

#### **Specific Issues and Linkages**

The RSWRF is located in Stead and is owned and operated by the City of Reno. RSWRF is permitted to treat a maximum month average day flow of 2.35 MGD. The plant effluent either discharges by gravity to Swan Creek, which drains to the Swan Lake wetlands, or it is reclaimed and pumped to several sites within the community for turf irrigation. Washoe County owns and operates the Lemmon Valley Water Reclamation Facility. It is a secondary treatment plant that has a permitted capacity of 0.3 MGD, with disposal by evaporation ponds.

Future water supplies will be provided by imported water, primarily from the Fish Springs Water Supply Project. As presented in the *North Valleys Effluent Disposal Options* report, (ECO:LOGIC, 2005b) and the *City of Reno and Washoe County TMSA/FSA Water, Wastewater and Flood Management Facility Plan* (ECO:LOGIC, 2007a), indicate that other means of reuse or disposal of reclaimed water will be needed based on the long-term development potential of the area. As presented in Chapter 4, the North Valleys Initiative (“NVI”) evaluated the feasibility and merits of expanding reclaimed water uses in Stead and Lemmon Valley. The Cold Springs Water Reclamation Facility (“CSWRF”) was also included in the NVI evaluation, since it too is located within a closed basin and its disposal capacity will not be sufficient for the projected future flows.

#### **Alternatives Evaluated to Address the Issues**

The City of Reno completed the RSWRF Phase 2 expansion improvements, which increased treatment and disposal capacity to 2.35 MGD, with specific improvements sized to accommodate higher flows. Similar to STMWRF, sludge disposal is handled by pumping to TMWRF for treatment and disposal. Eventually, RSWRF sludge will be processed on site for beneficial use or disposal.

Consistent with the recommendations from the *2004 – 2025 Regional Water Management Plan*, Reno and the RWPC investigated numerous “treatment and disposal alternatives for RSWRF that support an integrated plan for the region’s limited water resources, particularly water supply, effluent management and flood plain management strategies for this closed basin”. These alternative investigations included:



- A feasibility assessment of an effluent storage reservoir;
- An assessment of rapid infiltration basin (“RIB”) and vadose zone infiltration wells;
- A small scale pilot test of direct injection on three Washoe County test well;
- Evaluation of disposal alternatives including White Lake, Long Valley Creek, and a pipeline connection to Spanish Springs; and
- Expansion of the existing reclaimed water system to supply additional commercial irrigation needs.

The NVI team also investigated other options that would make better use of the reclaimed water resource, including an evaluation of the merits of a dual water system to provide irrigation water to residential customers, and an assessment of the feasibility of effluent ASR using a groundwater flow model to estimate the recharge storage capacity and identify potential impacts to nearby municipal wells.

To evaluate water quality issues associated with effluent ASR without using expensive RO treatment, Reno developed an alternative treatment demonstration project using either sand filtration or membrane filtration, ozonation, and biologically activated carbon.

Based on the 2035 flow projections identified in the Regional Water Balance presented in Chapter 6, expansion of the current treatment capacity to 4.0 MGD is projected to be sufficient for up to 20 years, but new reuse or disposal options need to be developed.

Based on the evaluation of disposal alternatives, the potential for RIBs or vadose wells to dispose of significant quantities of effluent within the Stead/Lemmon Valley area is limited. A feasible 3,000 af effluent storage reservoir site was identified; however, its capacity is not sufficient to meet long term needs, and other non-irrigation season disposal options will be required.

Results from the effluent ASR groundwater modeling work indicate that recharged water is unlikely to negatively influence the nearest municipal well at injection rates up to two MGD. A recharge program would improve groundwater levels within the west and east Lemmon Valley basins, and would benefit both municipal and domestic well users by reducing drawdown and pumping costs. Current calculations indicate that TDS from the recharged water would not likely reach the municipal supply wells for at least 60 years and the TDS would be substantially diluted as a result of advection and dispersion within the aquifer.

Compared to high energy RO systems, Reno’s alternative treatment process was effective in providing multi-barrier treatment for all major categories of contaminants of concern. The process benefits include lower capital costs, lower operation and maintenance costs and lower energy use compared to RO. Additionally, it eliminates treatment and disposal of process reject water, produced by RO.

Each of the treatment and disposal options is expensive; therefore, the region should make the investment that maximizes the benefits provided by the available water resources.

### **Proposed Action Items**

9.3.3.A Continue to evaluate the merits of regional integrated solutions between RSWRF and CSWRF for wastewater treatment and effluent reuse and disposal, including funding considerations.

9.3.3.B Continue to work with the NDEP on reclaimed water groundwater augmentation feasibility/demonstration efforts, including additional groundwater modeling assessments of aquifer storage and recovery.

### **Relevant Planning Documents**

- ECO:LOGIC, 2010b, August 2010, Removing Refractory Organics from Wastewater Using MF-03-BAC Treatment (Draft).
- ECO:LOGIC, 2010a, July 2010, North Valleys Initiative, Prepared for Washoe County.
- ECO:LOGIC, 2010c, February 2010, Treated Effluent Recharge Estimates, Lemmon, Cold Springs, Spanish Springs, Warm Springs and South Truckee Meadows Valleys.
- ECO:LOGIC, 2007a, City of Reno and Washoe County TMSA/FSA Water, Wastewater and Flood Management Facility Plan, ECO:LOGIC, Prepared for City of Reno and Washoe County.
- ECO:LOGIC, 2006a, North Valleys Reservoir Site, Results of Geological and Geotechnical Evaluations, prepared for City of Reno.
- ECO:LOGIC, 2005b, City Of Reno, North Valleys Effluent Disposal, Stead Vadose Zone Injection Wells Construction and Testing, prepared for City of Reno.
- ECO:LOGIC, 2005d, North Valleys Effluent Disposal Options, prepared for the City of Reno and the RWPC.
- ECO:LOGIC, 2005c, Washoe County Site, Injection Test Results Summary, prepared for Washoe County.
- Stantec, 2007, City of Sparks Conceptual Facility Master Plan, Stantec, Prepared for City of Sparks.
- WCDWR, December 2009, Groundwater Flow and TDS Transport Modeling, Lemmon Valley, NV.

### **9.3.4 Cold Springs**

#### **Specific Issues and Linkages**

The CSWRF is owned by Washoe County and operated by WCCSD, and is permitted to treat a peak month average day flow of 0.7 MGD. The CSWRF was included in the NVI evaluation, since it too is located within a closed basin and its disposal capacity will not be sufficient for the projected future flows. ECO:LOGIC (2007d) determined that other means of disposal or reuse of reclaimed water will be needed based on the long-term development potential of the area.

Several integrated water and wastewater issues are only partially understood, including: water importation; long term groundwater supply availability within the basin, taking into consideration

demands from both municipal and domestic wells; capability to assess water quality considerations, including TDS, nitrate, fate of the effluent disposed by the RIBs, and the potential for reclaimed water ASR; aquifer storage capacity; and coordination with the White Lake 100-year flood level.

Based on the 2035 flow projections in the Regional Water Balance, which assume importation of 4,330 af of water supply and CSWRF expansion to 1.2 MGD, a wastewater treatment and effluent disposal deficit of approximately 700 af is identified.

### **Alternatives Evaluated to Address the Issues**

The CSWRF has been upgraded to a new 0.7 MGD facility. Secondary treated wastewater is denitrified and disposed of at 12 RIBs with a capacity of up to 1.2 MGD.

Disposal capacity is projected to be sufficient for the near term; however, plans for future disposal options will need to be developed for the 20-year planning horizon. Reno and the RWPC investigated numerous treatment and disposal alternatives for RSWRF and CSWRF. In the Cold Springs area, these alternative investigations included:

- A feasibility assessment of an effluent storage reservoir.
- Evaluation of disposal to White Lake, which is feasible; but limited due to the reduction in flood storage capacity, and the potential mobilization of high TDS shallow groundwater. Increasing shallow groundwater levels adjacent to the playa could affect domestic wells and septic systems.
- Evaluation of disposal to Long Valley Creek, which flows into California. This is a “permissible” and technically feasible option, but it does not make efficient use of available water resources.

As discussed in the prior section, the NVI team also investigated options that would make better use of the reclaimed water resource, including a feasibility assessment of reclaimed water aquifer storage and recovery.

### **Proposed Action Items**

9.3.4.A Continue to evaluate the merits of regional integrated solutions between CSWRF and RSWRF for the treatment and disposal of wastewater, including funding considerations.

9.3.4.B Update and refine the existing Washoe County groundwater model for Cold Springs to address interrelated groundwater, surface water and wastewater issues.

### **Relevant Planning Documents**

- ECO:LOGIC, 2007a, City of Reno and Washoe County TMSA/FSA Water, Wastewater and Flood Management Facility Plan, Prepared for City of Reno and Washoe County.
- ECO:LOGIC, 2006b, White Lake Playa and Vicinity, Results of Geological and Hydrogeological Evaluations, Prepared for Washoe County.

- Stantec, 2007, City of Sparks Conceptual Facility Master Plan, Prepared for City of Sparks.

### **9.3.5 Tracy Segment (Lower Truckee River)**

#### **Specific Issues and Linkages**

Significant undeveloped, industrial zoned lands in both Washoe and Storey County are located in the Mustang and Patrick/Tracy areas, including the TRI Center. As presented in Section 9.1.6, TRI Center is seeking the use of up to 4,000 afa of TMWRF reclaimed water which would be used for cooling and other industrial purposes. No decisions regarding the provision of reclaimed water to TRI Center have been made at this time.

The long-term wastewater management approach for the Wadsworth area and Stampmill Estates subdivision may also require a separate planning effort. Currently, the PLPT facility provides secondary treatment and disposal through sedimentation and facultative lagoons for the town of Wadsworth. This facility is mentioned for regional information and coordination purposes only; it does not fall under the jurisdiction of the *Regional Water Plan*.

Septic systems will continue to be used in this area, and there is evidence of nitrate contamination to the groundwater, indicating the future need for municipal sewer service. Joint wastewater treatment and facility planning could be economically advantageous to both Washoe and Storey counties and should be considered in future work.

To comply with regional TMDLs and help protect water quality within the Truckee River, wastewater treatment facilities should be implemented that include nitrogen removal, with disposal practices that do not discharge nitrogen or phosphorus to the Truckee River.

Further planning and implementation of wastewater infrastructure in this area will be driven by parties interested in developing the land. Close coordination and cooperation between Washoe County and Storey County is needed to ensure long-term water quality objectives for the river are maintained.

#### **Alternatives Evaluated to Address the Issues**

A 270-unit residential development has been proposed adjacent to Stampmill Estates, which would require a municipal water and sewer system. If this project develops in the future, Stampmill Estates should be included in plans for municipal sewer service.

#### **Proposed Action Items**

9.3.5.A As this area of Washoe County and Storey County continues to grow, it will be important to monitor water quality for non-point source pollutants entering groundwater the Truckee River.

9.3.5.B Remain open to discussions among Washoe County, PLPT, and the City of Fernley to seek an area-wide water and wastewater strategy for lower Truckee River users.

## Relevant Planning Documents

- AGRA Infrastructure, 2000, Water and Wastewater Facility Plans on Industrial Zoned Lands Along the Lower Truckee River within Washoe County. Prepared for the RWPC.
- Stantec, 2007, *City of Sparks Conceptual Facility Master Plan*, Stantec, Prepared for City of Sparks.

### 9.3.6 Septic Systems and Water Quality

#### Specific Issues and Linkages

WCCSD has identified areas of water quality degradation as a result of septic system effluent, occurring predominantly in areas with high-density development. In addition to high densities, contributing factors to water quality degradation include shallow depths to ground water, permeable soil conditions, and proximity to sensitive receptors, such as water supply wells, creeks, rivers, and lakes. These conditions are present in Spanish Springs Valley, Golden Valley, Washoe Valley and Lemmon Valley. In Spanish Springs Valley, fifteen years of groundwater quality monitoring have shown increasing levels of nitrate contamination in municipal wells.

The management options for mitigation of nitrate contamination due to high densities of septic systems have been studied regionally. The results of these analyses have coalesced around possible mitigation strategies:

- Conversion of septic systems to a municipal sewer system;
- Conversion of septic systems to nitrate reducing septic systems;
- Dilution of groundwater via artificial recharge with treated drinking water resources;
- Pumping of high nitrate groundwater for non-potable uses to remove nitrates from the groundwater aquifer;
- Wellhead treatment for nitrate removal; and
- Alternative water supply.

#### Alternatives Evaluated to Address the Issues

The Washoe County District Health Department has undertaken several measures to reduce future potential impacts from septic systems. Effective 2001, the minimum lot or parcel size for new subdivisions and second or subsequent parcel maps proposing to use septic disposal was established at five acres. Smaller lots may be considered if it can be shown that adequate measures have been taken to ensure that the smaller lot area will not have a greater impact to the groundwater quality than the five-acre lot size.

In some areas of Washoe County, the number of septic systems allowed has been limited based on an analysis of the potential impacts to water quality. One such area is Verdi, where the *Washoe County Comprehensive Plan* allows a maximum of 1,300 septic systems (Washoe County, 2002).

Adequate measures for mitigation of nitrate contamination due to high densities of septic systems might include the installation of nitrate reducing septic systems, however an Oregon Department

of Environmental Quality (2005) multi-year study found that, although several systems showed high levels of nitrogen reduction in test centers, they did not perform as well in the field.

The *Spanish Springs Valley Water Reclamation Facility Plan*, completed in November 2004, recommended phased sewerage of the existing lots with septic systems in the area to TMWRF. Phased sewerage commenced in early 2005; Phase IA of the program is essentially complete and serves all but seven of the 210 homes identified as needing connection. Washoe County recently received grant funding from the Army Corps of Engineers (“ACOE”) for a portion of the Phase 1B construction, which will serve approximately 168 homes.

In light of the septic system densities in Spanish Springs Valley, the WCDWR conducted the *Septic Nitrate Baseline Data and Risk Assessment Study (2007)* throughout the densely populated portions of Washoe County served by septic systems. The goals of the study were to investigate the potential for nitrate contamination in the metropolitan and suburban areas of the Reno-Sparks metropolitan area, and to provide recommendations for prioritizing additional study of areas potentially contaminated by septic systems. Sixteen Project Areas were identified for investigation. Data from these specific areas were analyzed to determine the potential for areas with high-density septic systems to contribute to water quality degradation.

Results of the *Septic Nitrate Baseline Data and Risk Assessment Study* and previous studies point to the importance of septic system density, distance to sensitive receptors, and parcel size. The following recommendations were made:

- Notify owners of septic systems and domestic wells in area of known nitrate contamination and provide guidance on mitigation alternatives.
- Collect additional water quality and water level data from domestic well owners in all Project Areas.
- Collect water quality samples from surface water bodies adjacent to and downstream of high density septic systems.
- Perform additional analysis of currently available data, including basic mass balance and vadose-zone modeling of areas requiring further investigation.
- Perform a geographic information system (“GIS”)-based analysis of land-use, septic system age, and water quality trends around water supply wells.
- Consider the potential for other sources of nitrate contamination.

**Water and Sanitary Sewer Financial Assistance Program:** The 2009 Legislature Approved AB 54 authorizing Washoe County to establish a program to provide financial assistance to persons to connect to a public water or sewer system, and to owners of public or private property to make such property resistant to flood damage. The program is a direct response to property owner needs that are the result of changing economic conditions. When a property owner’s domestic well or on-site septic system fails and a community water or sewer system is available, existing state and District Health regulations require that the property be connected to the municipal system.

Hooking up to a municipal water or sewer system can cost between \$15,000 and \$30,000 per property. The proposed Water and Sanitary Sewer Financial Assistance Program is available to assist property owners by offering financing for on-site and public right of way costs including

connection fees, line extension fees, meter set fees, on-site trenching and plumbing needed to transfer from on-site to community systems, and required abandonment of septic systems and domestic wells.

The initial focus of the financing program was assisting property owners in these areas:

- Spanish Springs (septic to sewer conversion);
- Mayberry Ranch Estates (septic to sewer conversion);
- Heppner Subdivision (domestic well to community water system conversion); and
- Callahan Ranch (domestic well to community water system conversion).

### **Proposed Action Items**

9.3.6.A Continue to provide guidance to owners of septic systems and domestic wells on how to manage/mitigate domestic well water with elevated levels of nitrate.

9.3.6.B Support TMWA's pilot water treatment efforts for removal of nitrate and arsenic from groundwater.

### **Relevant Planning Documents**

- ECO:LOGIC, 2007a, City of Reno and Washoe County TMSA/FSA Water, Wastewater and Flood Management Facility Plan, ECO:LOGIC, Prepared for City of Reno and Washoe County.
- Kennedy/Jenks Consultants / Stantec, 2004, Spanish Springs Valley Water Reclamation Facility Plan.
- Stantec, 2007, *City of Sparks Conceptual Facility Master Plan*, Stantec, Prepared for City of Sparks.
- WCDWR, 2007, Septic Nitrate Baseline Data and Risk Assessment Study for Washoe County, PHASE I: Prioritization of Study Areas & Assessment of Data Needs.
- WCDWR, 2017, Septic Nitrate Baseline Data and Risk Assessment Study for Washoe County, PHASE II.

## **9.4 Truckee Meadows NPDES Storm Water Discharge Permit**

### **Specific Issues and Linkages**

The most recent Municipal Storm Water Discharge Permit was issued to Reno, Sparks and Washoe County (the "co-permittees") on May 26, 2010. The co-permittees are required to update the Storm Water Management Program for the five-year permit term within 18 months of the issue date, most recently November of 2011. Updates warrant an evaluation of the program element needs, activities and schedule from the issue date to permit reissuance. The existing permit term has been extended pending the issuance of a new permit.

The Storm Water Permit Coordinating Committee ("SWPCC") anticipates that, based on talks with the NDEP and review of national regulatory trends, a Waste Load Allocation will be assigned to

storm water in the future. It is not yet known how or when a storm water Waste Load Allocation will be implemented, or what constituents will be covered.

### **Alternatives Evaluated to Address the Issues**

In 2004, the SWPCC Interlocal Agreement was amended to provide for the SWPCC to advise Reno and Sparks City Councils and the Washoe County Board of Commissioners concerning the storm water permit and watershed management relative to water quality impacts to the watershed.

The SWPCC continues to request annual funding from the Regional Water Management Fund for the storm water program administration, to complete the required program updates and for specific projects.

### **Proposed Action Items**

9.4.A Continued SWPCC communication with the NDEP is necessary to address changes/updates to the NPDES Storm Water Discharge Permit.

9.4.B Support the update of the Watershed Management Plan such that it can be used to support applications to NDEP for 319(h) grants to help fund future watershed projects.

## **9.5 Integrated Use of Water Rights**

### **Specific Issues and Linkages**

There are many competing demands for water rights that must be considered from a broad planning perspective so that the limited availability will go the farthest in satisfying the water resource needs of the region. Some of the primary uses for Truckee River and tributary water rights in the planning area are listed below:

- Dedication of Truckee River water rights to TMWA for M&I supplies.
- Dedication of water rights for maintenance of in-stream flows in the lower Truckee River as required by the *Negotiated Settlement* (PL 101-618, 1990) and *TROA*.
- Dedication of water rights for water quality enhancement in the lower Truckee River as required by the Water Quality Settlement Agreement (“WQSA”), 1996.
- Dedication of water rights for reclaimed water return flow requirements to maintain in-stream flows and satisfy downstream water rights.
- Dedication of certain tributary creek water rights in the South Truckee Meadows for return flow requirements and surface water M&I supplies.

To independently satisfy these primary uses for water rights, plus others, may eventually require full utilization of the available water rights that the river and its tributaries can provide. The many uses for water rights and resources from the Truckee River and other sources need to be coordinated to the maximum extent possible by developing cooperative management strategies that satisfy two or more competing demands with the same water.

As presented in Section 6.3, the region has potentially available water resources to meet the projected demand increases; however, there are water imbalances in some of the planning areas



that will need to be addressed over the long term. These imbalances are not water resource availability issues, as water resource management options are available to help mitigate the potential negative effects. Rather, the issues are how to efficiently manage the use of the resources and minimize the resulting impacts, and how to identify who shares in the cost of mitigation.

Effluent reuse is a water management practice that provides multiple benefits to the region, including nutrient and TDS discharge compliance for TMWRF, and drought and water quality benefits to the Truckee River. As noted above, water rights dedications are sometimes necessary for reclaimed water return flow requirements.

Policy 2.1.a, Effluent Reuse - Efficient Use of Water Resources and Water Rights, is intended to provide guidance to purveyors when developing long range plans for effluent management.

### **Alternatives Evaluated to Address the Issues**

- TROA expands operation of Truckee River reservoirs creating greater flexibility, thereby increasing dry year reserves.
- Management options exist for tributary water rights dedicated for municipal water supply during non-drought conditions.
- In 1998, Reno, Sparks, Washoe County and PLPT began purchasing water rights as a result of the WQSA.
- Reno, Sparks and Washoe County, have, as agreed in TROA Section 1.E.4, provided 6,700 af of additional Truckee River water rights for water quality purposes.
- The Regional Effluent Management Team is working toward regionally-based solutions to several near-term effluent management issues, incorporating efficient use of water rights into alternatives being evaluated.

### **Proposed Action Items**

The NNWPC, TMWA, Washoe County, Reno and Sparks have undertaken efforts to respond to numerous recommendations for the integrated use of water rights. Cooperative management strategies should be developed among local governments, effluent providers and water purveyors that maximize the benefits derived from the available water resources. Additional work that needs to be completed includes:

- 9.5.A Continue the implementation of TROA and related agreements. Compare the water demand and water right recovery estimates to future conditions imposed by TROA and related agreements.
- 9.5.B Continue the water rights recovery program to convert inactive Truckee River water rights to beneficial use and update the water right status and demand projections regularly.
- 9.5.C Continue the analysis and development of non-structural measures to improve Truckee River water quality, enable increased TMWRF discharges to the Truckee River, and ensure the future sustainability of the river.

- 9.5.D Quantify groundwater and surface water resources and determine the feasibility of conjunctive use or other programs, including but not limited to expanded recharge projects, use of Fish Springs Ranch water supplies, and conversion of tributary water rights to M&I water supply and other beneficial uses.
- 9.5.E Develop cooperative management strategies among local governments, reclaimed water providers and water purveyors that maximize the benefits of available reclaimed water resources to the Truckee Meadows community.
- 9.5.F Monitor existing and future water demand and planning area growth projections, and develop plans to resolve any major discrepancies in consideration of available water resources and geographic constraints.

### **Relevant Planning Documents**

- Negotiated Settlement (PL 101-618, 1990).
- TROA, Section 1.E.4.
- WQSA, 1996.

## **9.6 Water Resources and Land Use Planning**

### **Specific Issues and Linkages**

The importance of integrating water resource management with land use planning has come to light in several forums in recent years. Rapid growth between 2003 and 2006, and relatively steady growth in recent years in the TMSA and outlying valleys has led to questions about the sustainability of the region's water resources. Specific regional-scale issues include:

- The availability and cost of water resources to supply the demands of existing and future development.
- The capacity to reuse or dispose of treated wastewater effluent generated by future development.
- The importance of flood plain management in reducing the risk of future flooding within the community.
- The importance of maintaining natural recharge to sustain groundwater resources.
- The potential of the region to use "green infrastructure" and Low Impact Development techniques to enhance regional aesthetics and quality of life while preserving or enhancing natural resources.
- The long-term costs of infrastructure operations and maintenance relative to projected development patterns.

In addition to these regional scale issues, some land use plans for outlying rural areas have identified imbalances between groundwater resources, appropriations and potential domestic well demands, such as the *Warm Springs Valley Area Plan* (Washoe County, 2010a).

## Alternatives Evaluated to Address the Issues

Following are some events pertinent to water resource management and regional land use planning that have occurred in the last several years:

- Washoe County Ballot Question #3: “Shall the Truckee Meadows Regional Plan be amended to reflect and to include a policy or policies requiring that local government land use plans be based upon and in balance with identified and sustainable water resources available within Washoe County?” passed by a majority of voters (November 2008).
- Reno, Washoe County and Sparks TMSA/FSA facility plans included an amendment to the *Regional Water Plan* (January 2009).
- Regional Plan amended to require the Regional Planning Commission to adopt a Consensus Population Forecast that is consistent with the estimated population that can be supported by the sustainable water resources identified in the *Regional Water Plan*; and Regional Planning Governing Board *Regulations on Procedure* amended to require that a comparison with the estimated population that can be supported by the sustainable water resources, as identified in the *Regional Water Plan*, be included as part of the process for updating and maintaining the adopted Consensus Forecast (January 2010).
- Truckee Meadows Regional Planning Agency (“TMRPA”), NNWPC and purveyors agreed on a methodology to calibrate consensus population forecast to annual certified population estimates and disaggregate population into subareas for water demand projections (April 2010).
- WRWC found that the forecasted population for 2036 can be supported by the sustainable water resources as set forth in the *Regional Water Plan* (August 2016).
- Washoe County, 2010b, Washoe County Consensus Forecast 2010-2030 adopted by RPC, including 2030 forecasted population of 590,490. (July 2010).
- Washoe County Consensus Forecast 2012-2032 adopted by RPC, including 2032 forecasted population of 560,772. (May 2012).
- Washoe County Consensus Forecast 2014-2034 adopted by RPC, including 2034 forecasted population of 563,779. (September 2014).
- Washoe County Consensus Forecast 2016-2036 adopted by RPC, including 2036 forecasted population of 548,159. (September 2016).
- TROA implementation (December 2015).
- *Truckee Meadows Housing Study* completed by TMRPA (2016).
- TMWA 2016-2035 Water Resources Plan adopted (2016).

## Proposed Action Items

9.6.A Continue working with TMRPA staff to strengthen appropriate linkages between the *Regional Plan* and the *Regional Water Plan*.

9.6.B Review areas within the TMSA boundary for gaps in facility planning and develop a plan to respond to changes in land use and the TMSA that affect current facility plans.

9.6.C Continue to coordinate with TMRPA and other entities on the development of a GIS parcel based tool that can be used to estimate potential water demands and wastewater flows based on approved land uses.

9.6.D Coordinate with local land use planning agencies to address rural groundwater basin imbalances.

### **Relevant Planning Documents**

- Amendment to the *Regional Water Plan*, 2009.
- ECO:LOGIC, 2007a, City of Reno and Washoe County TMSA/FSA Water, Wastewater and Flood Management Facility Plan.
- Stantec Consultants, 2008, City of Sparks TMSA/FSA Conceptual Facility Master Plan.
- Truckee Meadows Regional Plan, 2002, as amended.
- TROA, 2008, [www.usbr.gov/mp/troa/final/troa\\_final\\_09-08\\_full.pdf](http://www.usbr.gov/mp/troa/final/troa_final_09-08_full.pdf).
- Washoe County, 2010b, Washoe County Consensus Forecast 2010-2030 adopted by Regional Planning Commission 2010.
- Washoe County, 2008, Washoe County Consensus Forecast 2008-2030 adopted by Regional Planning Commission June 2008.
- Washoe County Master Plan, 2010a, Warm Springs Valley Area Plan, 2010.

## **9.7 Local Government Drainage Programs**

### **Specific Issues and Linkages**

The recent economic downturn and corresponding decrease in local government general fund revenues has constrained capital expenditures budgets for new storm water facilities and associated operations and maintenance at local governments without dedicated storm water funding mechanisms.

Some local governments are exploring the potential creation of utility districts with the goal of shifting from the general fund to utility district-based funding for storm water related functions.

Local government drainage programs and the Flood Project have some similar and complimentary responsibilities and needs, e.g., adjoining facilities, the need to form utility districts or other types of funding districts to generate revenue.

### **Alternatives Evaluated to Address the Issues**

In 2014, Reno identified alternatives for managing ditches used to convey storm water, including annual maintenance agreements with ditch companies, ditch acquisitions, and construction of storm drain infrastructure to exclude storm water from ditches.

A number of irrigation ditches serve as storm water drainage conveyances. In the early 2000s, Reno and Washoe County entered into agreements with some ditch companies for contributions toward annual maintenance costs. Significant storm events in 1997, 2005 and 2017 generated flows that exceeded ditch capacities in some locations leading to localized flooding.

In February 2009, the Washoe County Board of Commissioners directed Public Works staff to seek public input and explore facility and financing alternatives for the possible creation of an unincorporated County storm water utility district.

### **Proposed Action Items**

9.7.A Local government public works departments and the Flood Project are expected to discuss and reach consensus concerning funding and other issues involving local drainage programs and the Flood Project.

9.7.B Discuss with local government public works departments the status of the Truckee Meadows Regional Drainage Design Manual and possible need for developing and update.

### **Relevant Planning Documents**

- Report to NNWPC by Washoe County Department of Public Works, (May 5, 2010).

## **9.8 Regional Flood Plain Management and Flood Control**

### **Specific Issues and Linkages**

Chapter 5, Flood Management and Storm Water Drainage, identifies a number of issues and linkages concerning the Truckee River Flood Project, including:

**Flood Plain Storage and Critical Flood Pools:** Flood plain storage is a critical component of flood protection. Many properties that were built in compliance with Federal Emergency Management Agency standards for the National Flood Insurance Program may be at risk because of loss of flood plain storage. Reno, Sparks, Washoe County and Flood Project staff members involved in flood plain storage volume mitigation seek to ensure that the Flood Project remains feasible and future flood impacts are minimized.

**Federal and Local Funding for the Project:** The Flood Project may be the largest public works project ever undertaken in northern Nevada. The ACOE is expected to contribute to the project cost, however the community will be required to contribute the remainder. Although the Flood Project is locally funded by a 1/8-cent sales tax, additional funds will be required to meet the local sponsor's required funding contribution.

**Local Programs:** Local Drainage programs have some similar and complimentary responsibilities, e.g., flood plain management, adjoining facilities and the need to form utility districts, or other types of funding districts, to generate revenue for local flood control and drainage services.

**Upstream Dam Operations:** Releases from Lake Tahoe at the Tahoe City Dam and other reservoirs according to *TROA* will have an effect on flood flows in the Truckee Meadows.

## Alternatives Evaluated to Address the Issues

Reno and Washoe County have adopted ordinances amending development codes to address flood plain storage

Studies for funding, financing and rate alternatives are underway by TRFMA.

## Proposed Action Items

9.8.A Support TRFMA's efforts to develop funding for the flood project and incorporate cost, financing and rate information when available into the Regional Water Plan.

## Relevant Planning Documents

- RWPC, 2003, *Regional Flood Plain Management Strategy*, prepared by the Flood Plain Management Subcommittee for the RWPC.

## 9.9 Groundwater Quality Protection and Remediation

### 9.9.1 Groundwater Remediation

#### Specific Issues and Linkages

PCE in Central Truckee Meadows: Groundwater underlying the central Truckee Meadows is contaminated by tetrachloroethylene (also known as PCE) as described in Section 2.2.4. The Central Truckee Meadows Remediation District ("CTMRD") program, created in 1995 to address the problem, is administered on behalf of the Board of County Commissioners by the WCCSD.

Sparks Solvent/Fuel Site ("SS/FS"): The SS/FS is also described in Section 2.2.4. A new municipal well field comprised of six wells with a sustainable capacity of approximately 8,300 gpm or more to the north of the tank farm is likely to result in significant changes in local hydrodynamics when it is put into operation. Changes may include an increased risk to groundwater utilized for municipal water supply from contaminants at SS/FS. The NDEP is overseeing and directing the ongoing remediation of contaminated soils and groundwater at this site.

PCE in Lemmon Valley: Groundwater near the Reno-Stead Airport in the West Lemmon Valley hydrographic basin is also affected by solvent contamination. A PCE plume, identified there in 1994, is associated with military activities at the Stead Air Force Base during the 1940s and 1950s. Corrective actions are successfully controlling contaminant migration and cleaning up the impacted groundwater.

## Alternatives Evaluated to Address the Issues

PCE in Central Truckee Meadows: CTMRD program funds have paid for the construction and ongoing operation of three air-stripping treatment facilities that remove PCE from five TMWA wells. Program funds have also been used for the preliminary design of two additional treatment systems (using activated carbon) for wells with low levels of PCE. Treatment will be implemented for these wells (Sparks Avenue and Poplar #2) in the event PCE concentrations increase to the action level. A regular and systematic groundwater monitoring program was implemented in late 2003 to identify potential source areas, identify areas of higher risk, support resource management, and to prioritize other program activities. CTMRD program activities also include

focused stakeholder efforts to minimize the possibility for ongoing releases of PCE and ongoing source management on the part of WCDWR and the NDEP to identify and mitigate (where practical and cost-effective) PCE sources that are contributing to PCE plumes in the central Truckee Meadows. By minimizing the potential for ongoing releases and by mitigating sources contributing to the plumes, the time (and associated cost) required for well head treatment for PCE in the Truckee Meadows will decrease.

Sparks Solvent/Fuel Site (“SS/FS”): The plume is being hydraulically contained with extraction wells and contaminated groundwater is treated. The NDEP is overseeing and directing the ongoing remediation of contaminated soils and groundwater and is aware that changes to the monitoring and remediation strategy employed at the site may be necessarily with the development of the new well field.

Corrective actions are successfully controlling contaminant migration and cleaning up the impacted groundwater. Remediation at this site is being implemented by the responsible parties under direction and oversight of the NDEP (see Section 2.2.4).

### **Proposed Action Items**

9.9.1.A Support the efforts of the CTMRD and others to remediate solvent and/or fuel sites in the Planning Area.

### **Relevant Planning Documents**

- Camp Dresser and McKee, Bouvette Consulting and WCDWR, 2002, *Central Truckee Meadows Remediation District, Remediation Management Plan*, prepared for the Central Truckee Meadows Remediation District.

## **9.9.2 Groundwater Protection**

### **Specific Issues and Linkages**

In addition to remediation of contaminated groundwater, groundwater quality is protected by a number of activities including regular water quality monitoring, pumping schedules, programs to comply with drinking water standards (such as iron or radionuclides), public education and wellhead protection planning.

Wellhead Protection Programs: Water purveyors that manage wellfields are encouraged to develop Wellhead Protection Plans (“WHPP”) to protect groundwater quality through the delineation of zones of groundwater movement toward municipal supply wells and strategies to protect wellhead protection zones (see Section 2.2.4).

### **Alternatives Evaluated to Address the Issues**

The NDEP Bureau of Safe Drinking Water administers the Integrated Source Water Protection Program (“ISWPP”), and the NDEP Bureau of Water Quality Planning administers the Clean Water Act Section 319(h) Nonpoint Source Management Program which are both voluntary programs that help communities develop and implement plans that protect public drinking water supplies and reduce pollution. The programs also provide grant assistance to public water systems and communities throughout the State for implementation. The NDEP is folding the WHPP Program into the ISWPP and the two bureaus are working closely to coordinate ISWPP

and Nonpoint Source efforts. In January 2017, the WRWC approved a letter to the NDEP requesting participation in the ISWPP.

WHPPs have been developed and approved by the NDEP for TMWA's entire Truckee Meadows system (pre-consolidation) and the following systems acquired by TMWA as part of the consolidation of public purveyors:

- South Truckee Meadows;
- Arrowcreek;
- Hidden Valley;
- Lemmon Valley; and
- Spanish Springs.

### **Proposed Action Items**

9.9.2.A Continue development of WHPPs for systems not covered by approved plans.

9.9.1.B Participate in the State of Nevada's ISWPP and support the concurrent update and development of the Truckee River Watershed Management and Protection Plan.

### **Relevant Planning Documents**

- TMWA, 2008, Wellhead Protection Plan.
- WCDWR, 2004, STMGID and Arrowcreek Wellhead Protection Plan.
- WCDWR, 2004, Hidden Valley Wellhead Protection Plan.
- WCDWR, 1994, Lemmon Valley Wellhead Protection Plan.
- WCDWR, 2008, Spanish Springs Wellhead Protection Plan.



**TABLE 9-2 WRWC/NNWPC PROPOSED ACTION PLAN**

	<b>Action Item</b>	<b>Cross Reference</b>	<b>Category</b>	<b>Location</b>	<b>Subject</b>	<b>Proposed Action Item</b>	<b>Lead Agency</b>	<b>Coordinating Agencies</b>
	-a-	-b-	-c-	-d-	-e-	-f-	-g-	-h-
1	9.1.1.C		MWR	CTM	Cloud Seeding Program	Participate in the Desert Research Institute (“DRI”) cloud seeding program for the Lake Tahoe basin and the Truckee River basin, and coordinate with DRI’s efforts to continue the cloud seeding program statewide.	DRI	TMWA
2	9.1.1.D				Water Resources Planning	Adopt the TMWA 2035 WRP into the 2016 Regional Water Plan	WRWC	TMWA
3	9.2.A		CON	ALL	RWMP conservation chapter update	Revise Chapter 7 and “Base Case” conservation for consistency with the TMWA 2035 Water Resource Plan, Chapter 5, which is tied to drought, Floriston Rates and TROA.	NNWPC, WRWC	TMWA, Reno, Sparks, WC
4	9.2.B				Technical support for Water For The Seasons program	Support and participate in the Water For The Seasons program, led by UNR, which investigates climate variability and potential water supply risks.	UNR	Reno, Sparks, WC TMWA
5	9.3.1.A	9.5.D	WW	CTM STM	Near-Term Effluent Management Strategy Development	Continue development of near-term regional strategies to manage effluent and reduce nitrogen loading to the Truckee River, which may include additional treatment, expanded distribution of effluent within or outside the TMSA, and expanded uses which may include aquifer recharge and indirect potable reuse.	Reno, Sparks, WC, TMWA	WRWC
6	9.3.1.B	9.3.1.A			Expanded Use of Reclaimed Water	Pursue connection of additional reclaimed water users to the existing systems in Sparks and Reno, consistent with regional water quality and water rights considerations, and continue investigating the feasibility of expanded uses of reclaimed water	Reno, Sparks, WC	TMWA WRWC
7	9.3.1.C 9.3.2.C	9.3.1.A			Regional Integrated Solutions Between TMWRF and STMWRF	Continue evaluating the merits of regional integrated solutions between TMWRF and STMWRF for wastewater treatment and effluent reuse and disposal, including funding considerations. .	Reno, Sparks, WC	TMWA
8	9.3.3.A 9.3.4.A	9.3.1.A	WW	S/LV, CS	Regional Integrated Solutions Between RSWRF and CSWRF	Continue to evaluate the merits of regional integrated solutions between RSWRF and CSWRF for the treatment and disposal of wastewater, including funding considerations.	WC, Reno	
9	9.3.3.B	9.3.1.A			Effluent ASR Regulations	Continue to work with NDEP on reclaimed water groundwater augmentation feasibility/demonstration efforts, including additional groundwater modeling assessments of aquifer storage and recovery.	WC, Reno	TMWA, Sparks, WRWC

**Categories:**

MWR - Municipal Water Resources  
 CON - Water Conservation  
 WW - Wastewater Management  
 SW - Storm Water  
 SEP - Septic Systems and Water Quality  
 SWMP - Storm Water Management Program  
 WR - Water Rights  
 LUP - Land Use Planning

**Locations:**

TM - Truckee Meadows  
 CTM - Central Truckee Meadows  
 STM - South Truckee Meadows  
 S/LV - Stead/Lemon Valley  
 CS - Cold Springs  
 SS - Spanish Springs  
 LTR - Lower Truckee River  
 ALL - All Areas

**Agencies:**

TMWA - Truckee Meadows Water Authority  
 WC - Washoe County  
 Reno - City of Reno  
 Sparks - City of Sparks  
 WC - Washoe County  
 WCDHD - Washoe County District Health Department  
 TMRPA - Truckee Meadows Regional Planning Agency  
 TRFMA - Truckee River Flood Management Agency

BOR - Bureau of Reclamation  
 DRI - Desert Research Institute  
 SV - Sun Valley General Improvement District  
 STM - South Truckee Meadows General Improvement District

**TABLE 9-2 WRWC/NNWPC PROPOSED ACTION PLAN (con't)**

	Action Item	Cross Reference	Category	Location	Subject	Proposed Action Item	Lead Agency	Coordinating Agencies
	-a-	-b-	-c-	-d-	-e-	-f-	-g-	-h-
10	9.3.6.A		SEP	ALL	Public Engagement to Help Manage/Mitigate Domestic Well and Septic System Issues	Continue to provide guidance to owners of septic systems and domestic wells on how to manage/mitigate domestic well water with elevated levels of nitrate.	WC, Reno	TMWA, WCDH, WRWC, Sparks
11	9.4.A		SWMP	TM	SWMP Update	Continued SWPCC communication with NDEP as necessary to address changes/updates to the NPDES Storm Water Discharge Permit.	Reno Sparks, WC	WRWC
12	9.4.B				Watershed Management Plan Update	Support the update of the Watershed Management Plan such that it can be used to support applications for 319h grants to help fund future watershed projects.	Reno Sparks, WC	TMWA, WRWC
13	9.5.C		WR	ALL	Water Rights Recovery	Continue the analysis and development of non-structural measures to improve Truckee River water quality, enable increased TMWRF discharges to the Truckee River, and ensure the future sustainability of the river.	WC, Reno, Sparks	TMWA, WRWC
14	9.5.E	9.3.1.A 9.3.1.D 9.3.2.B			Expand Reclaimed Water Resources Benefits	Develop cooperative management strategies among local governments, reclaimed water providers and water purveyors that maximize the benefits of available reclaimed water resources to the Truckee Meadows community.	WC, Reno, Sparks	TMWA, WRWC
15	9.5.F				Monitor Plan Area Growth Projections	Monitor existing and future water demand and planning area growth projections, and develop plans to resolve any major discrepancies in consideration of available water resources and geographic constraints.	TMWA, WC, NNWPC	TMRPA, WRWC
16	9.6.A		LUP	ALL	Strengthen Linkages between TMRP and RWP	Continue working with TMRPA staff to strengthen appropriate linkages between the Regional Plan and the Regional Water Plan.	WRWC, TMRPA	
17	9.6.B				Review TMSA Boundaries and Revise Facility Plans	Review areas within the TMSA Boundary for gaps in facility planning and develop a plan to respond to changes in land use and the TMSA that affect current facility plans.	Reno, Sparks, TMWA, WC,	TMRPA, WRWC
18	9.6.C				Future Water Demands and Wastewater Flows	Coordinate with other entities on the development of a GIS parcel based tool that can be used to estimate potential water demands and wastewater flows based on approved land use.	WRWC, TMRPA	Reno, Sparks, WC, TMWA
19	9.6.D				Future Water Demands and Wastewater Flows	Coordinate with local land use planning agencies to address rural groundwater basin imbalances.	WC	TMWA, WRWC

Categories:

MWR - Municipal Water Resources  
 CON - Water Conservation  
 WW - Wastewater Management  
 SW - Storm Water  
 SEP - Septic Systems and Water Quality  
 SWMP - Storm Water Management Program  
 WR - Water Rights  
 LUP - Land Use Planning

Locations:

TM - Truckee Meadows  
 CTM - Central Truckee Meadows  
 STM - South Truckee Meadows  
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 CS - Cold Springs  
 SS - Spanish Springs  
 LTR - Lower Truckee River  
 ALL - All Areas

Agencies:

TMWA - Truckee Meadows Water Authority  
 WC - Washoe County  
 Reno - City of Reno  
 Sparks - City of Sparks  
 WC - Washoe County  
 WCDHD - Washoe County District Health Department  
 TMRPA - Truckee Meadows Regional Planning Agency  
 TRFMA - Truckee River Flood Management Agency

BOR - Bureau of Reclamation  
 DRI - Desert Research Institute  
 SV - Sun Valley General Improvement District  
 STM - South Truckee Meadows General Improvement District

**TABLE 9-3 ISSUES and PROPOSED ACTION ITEMS**

Action Item	Cross Reference	Location	Issue Category and Location	Subject	Proposed Action Item	Lead Agency	Coordinating Agencies	WRWC Role	5-year Plan Review horizon
-a-	-b-	-c-	-d-	-e-	-f-	-g-	-h-	-i-	-j-
1	9.1.1.A	TM	Municipal Water Resources, Central Truckee Meadows	Drought Standard	The NNWPC recommends the use of the 8-Year Drought Cycle, from 1987 to 1994 for consistency with TROA and TMWA planning, and review as necessary during the next update of this Plan	TMWA		M	X
2	9.1.1.B		Municipal Water Resources, Central Truckee Meadows	Water Supply Development	Continue to investigate sustainable water supply projects that are socially, economically and environmentally feasible and that can be implemented to ensure water supplies are available, as future demands require.	TMWA		M	
3	9.1.1.C		Municipal Water Resources, Central Truckee Meadows	Cloud Seeding Program	Participate in the Desert Research Institute ("DRI") cloud seeding program for the Lake Tahoe basin and the Truckee River basin, and coordinate with DRI's efforts to continue the cloud seeding program statewide.	DRI	WRWC TMWA	A	X
4	9.1.1.D		Municipal Water Resources, Central Truckee Meadows	Water Resources Planning	Adopt TMWA's 2016-2035 Water Resource Plan into the 2016 Regional Water Plan	WRWC	TMWA	A	X
6	9.1.2.B	STM	Municipal Water Resources, South Truckee Meadows	Plan to Mitigate Future Groundwater Level Declines	Support TMWA's Plan for Groundwater Sustainability on the Mt Rose Fan to mitigate future groundwater level declines and potential impacts to domestic wells.	TMWA		M	X
8	9.1.5.A	SS	Municipal Water Resources, Spanish Springs	Long-Term Groundwater Management Strategy	Monitor groundwater pumping and aquifer water levels to avoid long-term over-pumping. Use Truckee River water resources for conjunctive use and mitigation of water quality issues. Support TMWA's pilot water treatment efforts for removal of nitrate and arsenic from groundwater.	TMWA	TMWA, OTHERS	M	
9	9.1.5.C		Municipal Water Resources, Spanish Springs	Long-Term Septic to Sewer Conversion	Continue implementing phased conversion of areas with high densities of septic tanks to community sewer system as funding is made available.	WC		M	X
10	9.1.6.A	LTR	Municipal Water Resources, Lower Truckee River	Water Rights and Reclaimed Water Usage	Continued evaluation of reclaimed water management options, including TMWRF's near-term effluent management strategy development and water rights coordination for existing reclaimed water commitments and future potential demands.	Reno, Sparks	WC TMWA WRWC	A	X
11	9.1.6.B		Municipal Water Resources, Lower Truckee River	Storey County Coordination	Coordination with TRI Center and Storey County regarding future potential demands for the entire Tracy Segment hydrographic basin.	Reno, Sparks, WC	TMWA	M	X
12	9.1.7	TC	Municipal Water Resources, Truckee Canyon	Boomtown Water System	Coordinate with public and private water purveyors and developers regarding water resources, existing commitments and future potential demands for the Truckee Canyon hydrographic basin.	TMWA	Reno, Sparks, WC	A	X
13	9.1.8A	All	Groundwater Resource Development and Impact to Domestic Wells	Conjunctive use of surface water and groundwater resources	Support expansion of TMWA's Truckee River system to reach areas such as the Mt. Rose Fan and Verdi, to allow for conjunctive use. TMWA's aquifer storage and recovery program provides secondary benefits to domestic wells locally, such as in Lemmon Valley. Indirect potable reuse may provide future benefits.	TMWA	WC, Reno, Sparks	A	X
14	9.1.8B		Groundwater Resource Development and Impact to Domestic Wells	Conjunctive use of surface water and groundwater resources	Support TMWA's Plan for Groundwater Sustainability on the Mt. Rose Fan to mitigate future groundwater level declines and potential impacts to domestic wells.	TMWA	WC, Reno, Sparks	A	X
15	9.2.A	All	Water Conservation	RWMP conservation chapter update	Revise Chapter 7 and "Base Case" conservation for consistency with the TMWA 2035 Water Resource Plan, Chapter 5, which is tied to drought, Floriston Rates and TROA.	TMWA, WRWC	Reno, Sparks, WC TMWA	A	X
16	9.2.B		Water Conservation	Technical support for Water For The Seasons program	Support and participate in the Water For The Seasons program, led by UNR, which investigates climate variability and potential water supply risks.	UNR	Reno, Sparks, WC TMWA	A	X

**TABLE 9-3 ISSUES and PROPOSED ACTION ITEMS (con't)**

Action Item	Cross Reference	Location	Issue Category and Location	Subject	Proposed Action Item	Lead Agency	Coordinating Agencies	WRWC Role	5-year Plan Review horizon	
-a-	-b-	-c-	-d-	-e-	-f-	-g-	-h-	-i-	-j-	
17	9.2.C	All	Water Conservation	Precipitation Gauge Monitoring Program	Continue long-term regional precipitation gauge monitoring and data analysis.	WRWC	DRI	A	X	
18	9.3.1.A	9.5.D	Wastewater Management, Central Truckee Meadows	Near-Term Effluent Management Strategy Development	Continue development of near-term regional strategies to manage effluent and reduce nitrogen loading to the Truckee River, which may include additional treatment, expanded distribution of effluent within or outside the TMSA, and expanded uses which may include aquifer recharge and indirect potable reuse.	Reno, Sparks,	WC, TMWA, WRWC	A	X	
19	9.3.1.B	9.3.1.A 9.3.2.B		Expanded Use of Reclaimed Water	Pursue connection of additional reclaimed water users to the existing systems in Sparks and Reno, consistent with regional water quality and water rights considerations, and continue investigating the feasibility of expanded uses of reclaimed water	Reno, Sparks,	TMWA, WC, WRWC	A	X	
20	9.3.1.C			Integrated Solutions Between TMWRF and STMWRF	Continue evaluating the merits of regional integrated solutions between TMWRF and STMWRF for wastewater treatment and effluent reuse and disposal.	Reno, Sparks, WC WRWC	TMWA,	A	X	
21	9.3.2.A	9.3.1.A 9.3.2.B	STM	Wastewater Management, South Truckee Meadows	Pursue New Reclaimed Water Uses	Actively pursue a new reclaimed water strategy to continually balance the increasing supply with available storage capacity and demand. Alternative reuse methods should be explored in detail, in coordination with NDEP, such as reclaimed water aquifer recharge and cooling water for energy generation facilities	WC	Reno, Sparks, TMWA WRWC	A	X
22	9.3.2.B	9.5.D	STM	Wastewater Management, South Truckee Meadows	Pilot Testing in Support of Indirect Potable Reuse.	In regard to the potential regional implications of indirect potable reuse and aquifer recharge, it is recommended that the Reno Stead ozone-biological activated carbon ("BAC") pilot plant feasibility evaluation be continued at STMWRF to more fully optimize the technology.	WC	Reno, Sparks, TMWA	M	X
22	9.3.2.B	9.5.D	STM	Wastewater Management, South Truckee Meadows	Pilot Testing in Support of Indirect Potable Reuse.	In regard to the potential regional implications of indirect potable reuse and aquifer recharge, it is recommended that the Reno Stead ozone-biological activated carbon ("BAC") pilot plant feasibility evaluation be continued at STMWRF to more fully optimize the technology.	WC	Reno, Sparks, TMWA	M	X
23	9.3.2.C	9.5.D	STM	Wastewater Management, South Truckee Meadows	Regional Integrated Solutions between TMWRF and STMWRF	Continue evaluating the merits of regional integrated solutions between TMWRF and STMWRF for wastewater treatment and effluent reuse and disposal, including funding considerations.	Reno, Sparks, WC WRWC		M	X
24	9.3.3.A	9.3.4.A	S/LV	Wastewater Management, Stead / Lemmon Valley	Regional Integrated Solutions Between RSWRF and CSWRF	Continue to evaluate the merits of regional integrated solutions between RSWRF and CSWRF for the treatment and disposal of wastewater, including funding considerations.	WC, Reno	Sparks, TMWA, NDEP, WRWC	A	X
25	9.3.3.B	9.3.2.A		Wastewater Management, Stead / Lemmon Valley	Effluent ASR Regulations	Continue to work with NDEP on reclaimed water groundwater augmentation feasibility/demonstration efforts, including additional groundwater modeling assessments of aquifer storage and recovery.	WC, Reno	TMWA, Sparks	A	X
26	9.3.4.A	9.3.3.A	CS	Wastewater Management, Cold Springs	Regional Integrated Solutions between CSWRF and RSWRF	Continue to evaluate the merits of regional integrated solutions between CSWRF and RSWRF for the treatment and disposal of wastewater, including funding considerations.	WC, Reno	Sparks, TMWA, NDEP, WRWC	A	X
27	9.3.4.B			Wastewater Management, Cold Springs	Update the Existing Groundwater Model for Cold Springs	Update and refine the existing Washoe County groundwater model for Cold Springs to address interrelated groundwater, surface water and wastewater issues.	WC		M	

**TABLE 9-3 ISSUES and PROPOSED ACTION ITEMS (con't)**

Act ion Item	Cross Reference	Location	Issue Category and Location	Subject	Proposed Action Item	Lead Agency	Coordinating Agencies	WRWC Role	5-year Plan Review horizon	
-a-	-b-	-c-	-d-	-e-	-f-	-g-	-h-	-i-	-j-	
28	9.3.5.A	TS	Wastewater Management, Lower Truckee River	Groundwater And Surface Water Quality Monitoring	As this area of Washoe County and Storey County continues to grow, it will be important to monitor water quality for non-point source pollutants entering groundwater the Truckee River.	CMP	Reno, Sparks, WC	M		
29	9.3.5.B		Wastewater Management, Lower Truckee River	Area-Wide Water and Wastewater Strategy	Remain open to discussions among Washoe County, PLPT, and the City of Fernley to seek an area-wide water and wastewater strategy for lower Truckee River users.	WC	Reno Sparks, TMWA, PLPT, Fernley	M		
30	9.3.6.A	All	Septic Systems and Water Quality	Public Engagement to Help Manage/Mitigate Domestic Well and Septic System Issues	Continue to provide guidance to owners of septic systems and domestic wells on how to manage/mitigate domestic well water with elevated levels of nitrate.	WC, Reno, Sparks	WCHD, WRWC, TMWA	A	X	
31	9.3.6.B		Septic Systems and Water Quality	Collect Data and Develop Area-Specific Plans to Mitigate High Priority Areas of Nitrate/Arsenic Contamination	Support TMWA's pilot water treatment efforts for removal of nitrate and arsenic from groundwater.	TMWA, WC, Reno, Sparks	WCDH, WRWC	A	X	
32	9.4.A	TM	Truckee Meadows NPDES Storm Water Discharge Permit	SWMP Update	Continue SWPCC communication with NDEP as necessary to address changes/updates to the NPDES Storm Water Discharge Permit.	Reno Sparks, WC	WRWC	A	X	
33	9.4.B	TM	Truckee Meadows NPDES Storm Water Discharge Permit	Watershed Management Plan Update	Support the update of the Watershed Management Plan such that it can be used to support applications for 319h grants to help fund future watershed projects.	Reno Sparks, WC	TMWA, WRWC	M	X	
34	9.5.A	9.1.1.A	TM	Integrated Use of Water Rights	TROA Implementation	Continue the implementation of TROA and related agreements. Compare the water demand and water rights recovery estimates to future conditions imposed by TROA and related agreements.	TMWA	TROA Parties	M	X
36	9.5.C	9.5.E	All	Integrated Use of Water Rights	Measures to Improve Truckee River Water Quality	Continue the analysis and development of non-structural measures to improve Truckee River water quality, enable increased TMWRF discharges to the Truckee River, and ensure the future sustainability of the river.	TMWA	Reno, Sparks, WC, WRWC	A	X
37	9.5.D		LV	Integrated Use of Water Rights	Fish Springs Ranch Water Supplies	Quantify groundwater and surface water resources and determine the feasibility of conjunctive use or other programs, including but not limited to expanded recharge projects, use of Fish Springs Ranch water supplies, and conversion of tributary water rights to M&I water supply and other beneficial uses.	TMWA		M	X
38	9.5.E	9.3.1.D 9.3.1.A 9.3.2.B	All	Integrated Use of Water Rights	Expand Reclaimed Water Resources Benefits	Develop cooperative management strategies among local governments, reclaimed water providers and water purveyors that maximize the benefits of available reclaimed water resources to the Truckee Meadows community.	WC, Reno, Sparks	WRWC	A	X
39	9.5.F			Integrated Use of Water Rights	Monitor Plan Area Growth Projections	Monitor existing and future water demand and planning area growth projections, and develop plans to resolve any major discrepancies in consideration of available water resources and geographic constraints.	TMRPA	TMWA, WC, NNWPC, Reno, Sparks	A	X
40	9.6.A		All	Water Resources and Land Use Planning	Strengthen Linkages between TMRP and RWP	Continue working with TMRPA staff to strengthen appropriate linkages between the Regional Plan and the RWP.	NNWPC, TMRPA		A	X

**TABLE 9-3 ISSUES and PROPOSED ACTION ITEMS (con't)**

Action Item	Cross Reference	Location	Issue Category and Location	Subject	Proposed Action Item	Lead Agency	Coordinating Agencies	WRWC Role	5-year Plan Review horizon
-a-	-b-	-c-	-d-	-e-	-f-	-g-	-h-	-i-	-j-
41	9.6.B	All	Water Resources and Land Use Planning	Review TMSA Boundaries and Revise Facility Plans	Review areas within the TMSA Boundary for gaps in facility planning and develop a plan to respond to changes in land use and the TMSA that affect current facility plans.	WRWC, TMRPA	TMWA, WC, Reno, Sparks	A	X
42	9.6.C		Water Resources and Land Use Planning	Future Water Demands and Wastewater Flows	Coordinate with other entities on the development of a GIS parcel based tool that can be used to estimate potential water demands and wastewater flows based on approved land use.	TMWA, TMRPA, WRWC	Reno, Sparks, WC	A	X
43	9.6.D		Water Resources and Land Use Planning	Future Water Demands and Wastewater Flows	Coordinate with local land use planning agencies to address rural groundwater basin imbalances.	WC	TMWA, NNWPC	A	X
44	9.7.A	All	Local Government Flood and Drainage Programs	Public Works and Flood Project Coordination	Local government public works departments and the Flood Project and are expected to discuss and reach consensus concerning funding and other issues involving local drainage programs and the Flood Project.	Reno, Sparks, WC	TRFMA	M	X
45	9.7.B	All	Local Government Flood and Drainage Programs	Public Works and Flood Project Coordination	Discuss with local government public works departments the status of the Truckee Meadows Regional Drainage Design Manual and possible need for developing an update.	Reno, Sparks, WC	TRFMA	M	X
46	9.8.A	TM STM SS	Regional Flood Plain Management and Flood Control	Support of TRFMA	Support TRFMA's efforts to develop funding for the flood project and incorporate cost, financing and rate information when available into the Regional Water Plan.	TRFMA	Reno, Sparks, WC	M	X
48	9.9.2 A	TM	Groundwater Protection	Wellhead Protection	Continue development of WHPPs for systems not covered by approved plans.	TMWA		M	
49	9.9.2 B	TM	Groundwater Protection	Support of the ISWP program	Participate in the State of Nevada's Integrated Source Water Protection Program and support the concurrent update and development of the Truckee River Watershed Management and Protection Plan .	NDEP	Reno, Sparks, WC, TMWA, WRWC	M	

Locations:  
 TM - Truckee Meadows  
 CTM - Central Truckee Meadows  
 STM - South Truckee Meadows  
 S/LV - Stead/Lemon Valley  
 CS - Cold Springs  
 SS - Spanish Springs  
 TS - Tracy Segment  
 TC - Truckee Canyon (Verdi)  
 All - All Planning Areas

Agencies:  
 TMWA - Truckee Meadows Water Authority  
 Reno - City of Reno  
 Sparks - City of Sparks  
 WC - Washoe County  
 WCHD - Washoe County Health District  
 TMRPA - Truckee Meadows Regional Planning Agency  
 TRFMA - Truckee River Flood Management Agency  
 UNR - University Nevada Reno  
 DRI - Desert Research Institute

NSE - Nevada State Engineer  
 UTLI - Utilities, Inc.  
 PLPT - Pyramid Lake Paiute Tribe  
 CMP - Coordinated Monitoring Program  
 NDEP - Nevada Division of Environmental Protection  
 WRWC - Western Regional Water Commission  
 NNWPC - Northern Nevada Water Planning Commission

WRWC Role:  
 A - Action  
 M - Monitor and Report

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