



**2011 – 2030**

**Comprehensive Regional Water Management Plan**

January 14, 2011



## **Acknowledgements**

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## 2011 – 2030 Comprehensive Regional Water Management Plan

Requirement	Action
1. Northern Nevada Water Planning Commission public hearing and recommendation to Western Regional Water Commission Board of Trustees for approval and adoption, Sec. 45, Chapter 531, Statutes of Nevada 2007	Public hearing and recommendation by Resolution No. 10-2 on December 1, 2010
2. Western Regional Water Commission Board of Trustees public hearing and adoption of Plan, Sec. 46, Chapter 531, Statutes of Nevada 2007	Public hearing and adoption by Resolution No. 4 on January 14, 2011
3. Truckee Meadows Regional Planning Commission review for consistency with the Truckee Meadows Regional Plan, Sec. 43, Chapter 531, Statutes of Nevada 2007	Public hearing and finding of consistency on May 11, 2011



## Executive Summary

### 1. Introduction

The Western Regional Water Commission (“WRWC”) was created in 2007, effective April 1, 2008, by the Nevada Legislature, and by Cooperative Agreement among the WRWC member agencies. Chapter 531, Statutes of Nevada 2007, the Western Regional Water Commission Act (the “Act”) also created the Northern Nevada Water Planning Commission (“NNWPC”) and required the NNWPC to develop a comprehensive regional water management plan for the Planning Area covering municipal and industrial water supply, water quality, sanitary sewerage; sewage treatment, storm water drainage and flood control. The overall purpose is to deal with current and future problems affecting the Planning Area as a whole with respect to the subjects of the plan. The Act further requires the NNWPC to develop the initial *2011-2030 Comprehensive Regional Water Management Plan* (“*Regional Water Plan*”) on or before January 1, 2011.

The *Regional Water Plan* compiles and integrates multiple sources of information in an effort to be inclusive, provide comprehensive, consistent policy-level guidance to regional and local entities and comply with the Act. The plan development process provided a broad level of coordination, data sharing and alternatives analysis that would not have otherwise occurred. The *Regional Water Plan* is not an enforcement-oriented plan and relies on the cooperation and collaboration of the WRWC member agencies, NNWPC members and local and regional government planning agencies for implementation.

Among the most valuable elements of the *Regional Water Plan* is the development of goals and policies to deal with current and future problems affecting the Planning Area. These policies provide a set of consistent guiding principles for public purveyors, other service providers and local and regional government planning agencies to consider when developing their plans and reviewing the plans of others.

Outcomes of plan implementation should include cost-efficient, integrated water-related services provided by public purveyors and local governments to current and future citizens of the Planning Area.

### 2. Policies

#### Background

The Act includes among the required contents of the *Regional Water Plan*, appropriate goals and policies to deal with current and future problems affecting the Planning Area. This Plan identifies the Planning Area’s water-related needs over a 20-year timeframe, the constraints on meeting those needs and pertinent background information. To adequately evaluate alternatives for meeting the Planning Area’s needs and to evaluate future projects for conformance with this Plan, the following policies will apply for the supply of municipal and industrial water, sanitary sewerage, treatment of sewage, drainage of storm water, and control of floods.



## **Goal 1: Plan for the Development of Sustainable Water Supplies**

### **Objective 1.1 Promote Efficient Use of Resources**

#### ***Policy 1.1.a: Geographic Use of Truckee River Water***

*Use of Truckee River water rights in additional hydrographic basins shall conform to the Regional Water Plan if such uses are an efficient use of water resources; meet or satisfy all regulatory requirements and operating agreements; maintain or improve water quality for downstream users and maintain a healthy river environment, recreational opportunities, and economic development.*

#### ***Policy 1.1.b: Water Conservation***

*Water conservation measures that promote smart management of the Planning Area's water resources will be implemented for the benefit of the community. Additionally, the community will be expected to conserve more water during drought.*

#### ***Policy 1.1.c: Management of Conserved Truckee River Water***

*Conserved water originating from the Truckee River shall be managed consistent with agreements among local entities and parties of interest to the Truckee River.*

#### ***Policy 1.1.d: Evaluation of the Unexercised Portion of Committed Water Supplies***

*The feasibility of alternative uses and management of the unexercised portion of committed water supplies shall be evaluated. This appropriated but unused water could possibly be dedicated to a variety of beneficial uses.*

#### ***Policy 1.1.e: Water Meters***

*Water purveyors within the Planning Area shall meter to the extent practicable, all uses or sales of water within their respective service areas.*

### **Objective 1.2 Provide an Acceptable Level of Service to the Community**

#### ***Policy 1.2.a: Conjunctive Management of Surface Water and Groundwater Supplies to withstand a 9-year Drought Cycle***

*For planning purposes, the conjunctive management of surface water and groundwater supplies for municipal and industrial use shall be designed to withstand the worst drought cycle of record, that being the drought of 1987-1994, plus one dry year (1987) added to the cycle.*

#### ***Policy 1.2.b: Water Resource Investigations***

*Where a water supply deficiency exists or a potential water supply deficiency may occur as a result of master plan, zoning or land use changes or changes to the Truckee Meadows Service Area ("TMSA") boundary, or there is a need for additional water resources to meet other regional objectives, the NNWPC may investigate alternatives to meet the potential water requirement.*

***Policy 1.2.c: Emergency Water Supply Standard***

*Water service providers using Truckee River water rights supplemented with other water resources shall design and manage their supplies to meet all indoor water uses, and withstand a short-term contamination event (1-2 days) with no interruption in service, and a 7-day event through the use of mandatory conservation.*

***Policy 1.2.d: Water Supplies to Meet Safe Drinking Water Act Requirements***

*All drinking water supplies provided by public water systems shall meet or exceed the requirements of the Safe Drinking Water Act.*

**Objective 1.3 Implement Measures to Ensure a Sustainable Water Supply**

***Policy 1.3.a: Wellhead Protection***

*To protect public health and to ensure the availability of safe drinking water, the Washoe County District Health Department (“WCDHD”) (for domestic wells) or local governments with input from the water purveyors with groundwater production facilities in the vicinity of a proposed project shall review any proposed project that may cause possible groundwater contaminating activities. Water purveyors are encouraged to develop wellhead protection programs that can be integrated with local government review processes for new business or development.*

***Policy 1.3.b: Protection and Enhancement of Groundwater Recharge***

*Natural recharge areas shall be defined and protected for aquifer recharge. Applicants for proposed projects and proposed land use changes in areas with good recharge potential shall be encouraged to include project features or adequate land for passive recharge.*

***Policy 1.3.c: New Water Resources / Importation***

*New water resources, including imported water, may be developed provided they further the goals of the Regional Plan and the Regional Water Plan.*

***Policy 1.3.d: Water Resources and Land Use***

*Land use designations or zoning designations do not guarantee an allocation of future water resources. This applies to both surface water and groundwater, including groundwater for domestic wells. While a potential water supply deficiency may exist based on approved land uses, water supply commitments may only be approved pursuant to Policy 1.3.e.*

***Policy 1.3.e: Water Resource Commitments***

*Issuance of new commitments against a water resource or combination of resources shall be made in conformance with existing State Engineer permits, certificates or orders; water purveyor rules or policies; and/or local government policies. The local governments, water purveyors, and State Engineer will seek to achieve a balance between commitments and the sustainable yield of the resources in the region.*

***Policy 1.3.f: Groundwater Resource Development and Management of Water Quality***

*Existing and proposed municipal and industrial well sitings must be evaluated for their influence on the potential for contaminated groundwater migration to areas of potable groundwater. Also, development of groundwater resources shall not result in deterioration of groundwater quality through migration of contaminants.*

***Policy 1.3.g: Corrective Action for Remediation of Groundwater***

*The corrective action taken for remediation of groundwater contamination is typically driven by public health and environmental concerns, and applicable local, state and federal regulations. Realizing this, the affected community shall consider the cost and level of cleanup for groundwater remediation.*

**Goal 2: Plan for Regional Wastewater Treatment and Disposal Requirements**

***Objective 2.1 Promote Efficient Use of Resources***

***Policy 2.1.a: Effluent Reuse - Efficient Use of Water Resources and Water Rights***

*The use of reclaimed water for irrigation, recharge or other permitted uses should be pursued where such use is an efficient use of water resources and water rights.*

***Policy 2.1.b: Reduction of Non-Point Source Pollution for TMWRF Pollutant Credit***

*Options for centralized wastewater treatment with surface water discharge shall include alternatives for reducing non-point source pollution, which may be more environmentally sensitive, and where appropriate should be pursued as pollutant credits for Truckee Meadows Water Reclamation Facility (“TMWRF”).*

***Objective 2.2 Manage Wastewater for Protection and Enhancement of Water Quality***

***Policy 2.2.a: Septic Tank Density and Groundwater Pollution***

*Future development using septic systems should not be allowed in densities that would risk groundwater or surface water quality degradation such that applicable water quality standards are threatened. When adverse surface water or groundwater impacts occur as a result of existing or proposed increases to the concentration of septic systems in an area, alternative sewage disposal, groundwater treatment, or other mitigation measures must be implemented based on cost, longevity of the solution, and existence of a credible entity to be responsible for the continuing performance of the selected system.*

**Goal 3: Plan for the Protection of Human Health, Property, Water Quality and the Environment through Regional Flood Plain and Storm Water Management**

***Objective 3.1 Effective and Integrated Watershed Management***

***Policy 3.1.a: Regional Flood Plain Management Plan for the Truckee River***

*The NNWPC will review the regional Flood Plain Management Plan for the Truckee River watershed and forward its recommendations to local governments.*

***Policy 3.1.b: Flood Plain Storage within the Truckee River Watershed***

*Until such time as Reno, Sparks, and Washoe County adopt and begin to implement a Flood Plain Management Plan for the Truckee River, the local flood management staff<sup>1</sup>, using the best technical information available and applicable local ordinances, will work with a proposed project applicant or a proposed land use change applicant to determine the appropriate level of analysis required in order to evaluate and mitigate the impacts experienced during the 1997 flood. On an annual basis, all three local flood management agencies and the Flood Project shall jointly agree on and adopt the “best technical information” available for use in implementation of this policy.*

***Policy 3.1.c: Flood Plain Storage outside of the Truckee River Watershed***

*As appropriate, the local flood management staff will work with proposed project applicants or proposed land use applicants to identify the best approach to mitigate the impacts of changes to 100-year flood peaks and flood plain storage volume that are a result of proposed land use changes or proposed projects.*

***Policy 3.1.d: Truckee River Restoration***

*In review of proposed projects and proposed land use changes within the areas identified for restoration in Figures 5-4 and 5-5, the local governments shall make findings supporting the implementation of potential restoration projects as identified in the Lower Truckee River Restoration Plan or the Truckee River Flood Project being developed in conjunction with the Army Corps of Engineers (“ACOE”).*

***Policy 3.1.e: Watershed Protection***

*Watershed protection programs shall be implemented for the Truckee River, its tributaries, and other perennial streams in the region.*

***Policy 3.1.f: Adoption of Storm Water Quality Programs***

*A storm water quality program shall be implemented region-wide, including the continuation and/or enhancement of existing programs in Reno/Sparks/Washoe County, such as the Truckee Meadows Regional Storm Water Quality Management Program, to address not only urban runoff but also other non-point sources.*

***Policy 3.1.g: Management Strategies for Slopes Greater than 15 Percent***

*Local government management strategies for hillsides with natural slopes greater than 15 percent and less than 30 percent shall be submitted to the NNWPC for review, comment, and recommendations prior to incorporation into local government master plans.*

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<sup>1</sup> Each local government has assigned one or more staff members the responsibility of designing and reviewing flood management projects. These staff members are also responsible for reviewing certain proposed projects to address concerns of drainage and flooding.

***Policy 3.1.h: Adoption of Storm Water Drainage Guidelines***

*Regional guidelines for storm water hydrologic criteria and drainage design shall be pursued to address, to the extent practicable, inconsistencies between local governments' existing criteria and design standards.*

***Policy 3.1.i: Flood Plain Management / Flood Control Projects Subject to NNWPC Review***

*Facility plans and infrastructure studies for flood control projects developed by local governments will be reviewed by the NNWPC according to Policy 4.1.a to ensure coordination of local projects with regional water management objectives, including but not limited to, regionally coordinated flood damage reduction, preservation or enhancement of recharge, preservation of natural drainage ways, preservation of riparian habitat, protection or enhancement of surface and groundwater quality.*

**Goal 4: Support the Implementation of the Truckee Meadows Regional Plan**

**Objective 4.1 Coordinated Infrastructure Planning**

***Policy 4.1.a: Facility Plans – Conformance with Regional Water Plan***

*Pursuant to Section 51 of the Act, facilities of a kind or size that affect the working of the Regional Water Plan as distinct from providing normal service to customers, including water supply and storage, wastewater collection and treatment, storm water, and flood control, shall be reviewed by the NNWPC for conformance with the Regional Water Plan, and recommended to the WRWC.*

***Policy 4.1.b: Timing and Sizing of Facilities***

*To the extent allowed by state statutes, local codes and ordinances, planning for facilities (defined in the Act) shall be based on existing data and forecasts of future trends, including conservation, to ensure that facilities will be built pursuant to local entities' Capital Improvement Programs ("CIPs") with sufficient lead-time to ensure public demands are met.*

***Policy 4.1.c: NNWPC Programs and Policies to Reinforce Goals of the Regional Plan***

*All the policies and criteria for facility plan review adopted by the NNWPC shall be consistent with and carry out the provisions of the Regional Plan.*

***Policy 4.1.d: Inclusion of Non-Economic Criteria in Evaluation of Alternatives***

*Non-economic criteria including, but not limited to, environmental impact, public impact, and archeological impact will be evaluated during the program or project alternative selection process.*

***Policy 4.1.e: Economic Decision-Making Criteria***

*NNWPC recommendations regarding economic decisions shall be, to the extent possible, based on minimizing the costs to the entire community for providing adequate services as defined by the policies and criteria of this Plan.*

***Policy 4.1.f: Examination of Long-Term Impact on Availability of Water Resources***

*In considering water, wastewater, and flood control projects or management options, the long-term impact on the availability of water resources shall be examined.*

**Objective 4.2 Clarification of the Role of the WRWC and the NNWPC**

***Policy 4.2.a: Role of NNWPC in Water Related Issues***

*The NNWPC shall address a water-related matter, consistent with its responsibilities as described in the Act.*

***Policy 4.2.b: Role of WRWC in Water Related Issues***

*The WRWC shall address a water-related matter, consistent with its purposes, powers and responsibilities as described in the Act.*

**3. Findings**

The *Regional Water Plan* contains numerous findings relative to the subjects of the Plan, which are summarized below.

**Water Resources**

For the 2010-2030 planning horizon, sustainable water resources are estimated at approximately 183,000 acre feet per year (“afa”), including resources presently dedicated for municipal and industrial (“M&I”) uses and those that may be converted from other uses to M&I. This planning-level estimate of available resources, however, should not be considered a commitment to, nor a guarantee of, the availability of a water allocation for any specific project or parcel.

Recent data show that more than 37,000 afa of reclaimed water is generated in the Planning Area, of which approximately 6,000 afa are used for non-potable purposes such as irrigation, construction and dust control; the remainder is discharged to the Truckee River, Swan Lake wetlands or to the ground via infiltration basins. The Nevada Division of Environmental Protection (“NDEP”) is developing amendments to its reclaimed water regulations that are anticipated to allow for groundwater recharge using highly treated reclaimed water.

The primary water rights that applicants for new water service dedicate to the Truckee Meadows Water Authority (“TMWA”) or Washoe County Department of Water Resources (“WCDWR”) are mainstem Truckee River water rights. Although the number of remaining Truckee River mainstem irrigation water rights available for conversion to M&I use continues to decrease, analysis in TMWA’s *2030 Water Resource Plan* shows that over 50,000 acre feet (“af”) of Truckee River mainstem rights are potentially available for dedication to TMWA or WCDWR to support future will-serve commitments, and this amount is more than enough to meet TMWA’s future water rights requirements through the planning horizon.

When implemented, the *Truckee River Operating Agreement* (“TROA”) will allow for a congressionally authorized interstate allocation of water and change the operations of the Truckee River system to accommodate multiple beneficial uses for drought supply, endangered

and threatened fish species, water quality, California water use, and storage. In addition, operations will enhance riparian habitat, reestablish river canopy, enhance reservoir releases, improve recreational pools in the reservoirs, and improve the process for emergency drawdown procedures for Lake Tahoe. Although *TROA* was signed on September 6, 2008 by the Mandatory Signatory Parties (TMWA, Pyramid Lake Paiute Tribe (“PLPT”), California, Nevada, and the United States) and seven other parties, a number of contingencies have been satisfied since *TROA*’s execution, while others, primarily litigious actions, need resolution before the agreement can be implemented.

As much as 8,000 af of groundwater is available for importation from the Honey Lake Valley hydrographic basin to Lemmon Valley by way of existing infrastructure. The timing of such groundwater importation will depend on future land development projects in Lemmon Valley.

The most imminent threats to the reliability of the Planning Area’s water supplies are weather and source water supply contamination, both of which may affect the quantity and quality of available water supplies. Numerous purveyor programs are in place within the Planning Area to address existing problems and threats having the potential to affect available water supplies.

### **Water Purveyors and Other Water Providers**

There are currently four major public water purveyors within the Planning Area; TMWA, WCDWR, Sun Valley General Improvement District (“SVGID”), and South Truckee Meadows General Improvement District (“STMGID”). These four purveyors provide 95 percent of the municipal water service within the Planning Area.

TMWA and WCDWR have entered into an agreement to move forward with consolidation of WCDWR water utilities with TMWA. STMGID, which relies on the WCDWR for utility operation and maintenance, is evaluating alternatives for future operations which range from consolidation with TMWA to a stand-alone utility.

A small number of privately owned public utilities exist in the Planning Area, which are regulated by the Public Utility Commission of Nevada (“PUC”). Numerous other small private water systems exist which are solely regulated by the WCDHD. These systems are typically associated with commercial businesses, which do not have municipal water service available.

A significant number of residential parcels within the Planning Area rely on individual wells for domestic water supply. The use of domestic wells is allowable for parcels where municipal service is not available. A major concern regarding domestic wells has been development in certain areas where withdrawal of groundwater has resulted in the lowering of the water table. A variety of steps have been taken to address the issue including restrictions on development of parcels in certain hydrographic basins, which require retirement of water rights and restrictions on subdividing existing parcels without the dedication of water rights.

There are three reclaimed water purveyors within the Planning Area; City of Reno, City of Sparks and WCDWR. Reno and Sparks co-own TMWRF, which supplies approximately 4,000 af of reclaimed water per year to the two purveyors’ reclaimed water distribution systems. In addition, the Reno-Stead Water Reclamation Facility (“RSWRF”) supplies approximately 500 af of reclaimed water per year to Reno’s Stead reclaimed water system. Washoe County owns and operates the South Truckee Meadows Water Reclamation Facility (“STMWRF”), which

supplies 100 percent of its effluent, approximately 2,300 af of reclaimed water per year, to the WCDWR reclaimed water system in the South Truckee Meadows.

## **Wastewater and Watershed-Based Water Quality Planning**

### ***Facilities***

The five publicly owned wastewater treatment facilities in the Planning Area are each processing sewage at average daily flows well below maximum capacities.

### ***Reclaimed Water***

The North Valleys Initiative process showed that reclaimed water can satisfy multiple purposes with the appropriate level of treatment for each specific use.

Expanded use of reclaimed water is feasible and could include uses such as residential landscape irrigation and groundwater recharge or indirect potable reuse (“IPR”). Such uses are being studied with respect to regulatory issues, treatment technologies and public perception. Public involvement will be an important aspect of the decision-making process concerning expanded uses of reclaimed water.

### ***Septic Systems***

An Oregon study of nitrogen-reducing septic systems installed at residences found that, although several systems showed high levels of nitrogen reduction in test centers, they did not perform as well in the field. Nitrogen reduction below 10 milligrams per liter (“mg/L”) appears to be difficult to achieve consistently without a secondary carbon source. Conversion of septic systems to a municipal sewer system appears to be the most reliable, albeit expensive, mitigation of nitrate contamination due to high densities of septic systems. Artificial groundwater recharge using fresh water injected into the aquifer, such as in Golden Valley, has also proven beneficial in improving water quality with respect to nitrate.

### ***Watershed / Water Quality***

The Truckee River water quality standard for total phosphorus was established by the state using a national guideline, rather than a site-specific approach. With advancement in the understanding of Truckee River functions and processes, a site-specific standard can be developed that is protective of the river and its beneficial uses without being overly restrictive.

The current Storm Water National Pollutant Discharge Elimination System (“NPDES”) permit was issued to Reno, Sparks and Washoe County on May 26, 2010, and requires an update of the Storm Water Management Program within 18 months of the issue date (November of 2011).

Based upon conversations with NDEP and observations of national regulatory trends, the Storm Water Permit Coordinating Committee anticipates that there will be a waste load allocation (“WLA”) assigned to Truckee Meadows storm water in the future.

## **Flood Management and Storm Water Drainage**

Riverine flooding and alluvial fan flooding are both common in northern Nevada. Riverine flooding occurs when flows in rivers and streams rise over a period of hours or days and overtop



stream banks inundating nearby flood plains and low-lying areas. Alluvial fan flooding occurs when floodwaters emerge from a canyon flowing out of the upper mountains onto an alluvial fan, typically with little or no warning, and travel downstream at very high velocities carrying significant loads of sediment and debris.

Physical damages and economic impacts resulting from the 1997 Truckee River flood (the largest flood of record) totaled about \$700 million<sup>2</sup> in Washoe County and \$1 billion in the six-county area hit by the flood in northern Nevada. The property at risk from a 100-year flood in the Truckee Meadows was valued by Washoe County in 2004 at approximately \$5 billion using a geographic information system (“GIS”) compilation of the 1997 flood boundary and the assessed value for parcels within the boundary. A 2007 analysis by the Nevada Bureau of Mines and Geology (“NBMG”) using a Federal Emergency Management Agency (“FEMA”) loss estimation model to estimate 100-year flood risk in Washoe County estimated building exposure, a measure of the economic wealth of the county, at \$25 billion and building-related economic losses at \$980 million (NBMG, 2007).

Incorporation of hydrologic data since the mid-1980s has resulted in estimated peak flow for specific frequency events higher than originally thought<sup>3</sup>. The 100-year flood event (or one-percent risk flood) at Reno is now estimated to be 20,700 cubic feet per second (“cfs”). Peak flows for certain frequency events are shown below:

<b>Exceedance (i.e., chance of occurrence in any single year)</b>	<b>Peak Flow (cfs)</b>
1/20	9,200
1/50	14,800
1/100*	20,700
1/500	63,000

Source: ACOE

\* Flooding that has a one-percent chance of being equaled or exceeded in any given year, also referred to as a 1 in 100 year flood event or a 100-year flood. Note: The USGS, using a different analysis technique to account for upstream reservoirs estimates the 1/100 peak flow to be approximately 26,000 cfs.

The peak water surface elevation for the January 1997 flood, considered to be slightly greater than the 100-year flood event, was approximately 1.6 feet higher than the existing FEMA base flood elevation at the Vista gage. Therefore the actual 100-year flood levels are higher than those shown on FEMA flood maps especially in the area east of U.S. Highway 395, with the greatest difference occurring east of McCarran Boulevard. Structures built to current FEMA standards within the area approximately bounded by Rock Boulevard, Interstate 80, and Mira Loma Boulevard are not necessarily protected during a 100-year flood event despite the depictions on the FEMA flood maps.

<sup>2</sup> In 1997 dollars. The ACOE estimated physical National Economic Development (“NED”) Plan damage at about \$500M. The Truckee River Water Management Council did an economic impact study that concluded total damage to be \$780M.

<sup>3</sup> In the 1985 feasibility report for the Truckee River Flood Project, the estimated discharge for the 100-year event at Reno was computed at approximately 18,500 cfs. This flow has been used by FEMA to identify areas subject to flooding for flood insurance purposes.

FEMA maps were adopted for the region in 1984. Local ordinances were adopted shortly thereafter requiring the first floor of structures to be elevated either one or two feet above the FEMA base flood elevation. Structures constructed after 1984 were generally built in compliance with these ordinances and are at less risk of flooding, while structures constructed prior to 1984 are at higher risk. However, many of the FEMA current flood maps are off by 0.5 to 1 foot as demonstrated in the 1997 flood, during which some homes experienced flooding unexpectedly.

As land uses change in the Truckee River watershed, both runoff volumes and velocity of flows typically increase. This is reflected in changes in the shape and size of the hydrographs of flows entering the Truckee River at places such as the North Truckee Drain, Boynton Slough, Dry Creek, Evans Creek, and Steamboat Creek. Without mitigation, these changes could affect the functioning of the Truckee River Flood Project by causing higher peak flood elevations, thus reducing the effectiveness of the project and reducing the level of protection.

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

On April 9, 2010, the WRWC determined and made a finding that the draft Washoe County Consensus Population Forecast for 2030 is less than the estimated population that can be supported by the sustainable water resources identified in the *Regional Water Plan*. The finding was transmitted to the Truckee Meadows Regional Planning Agency (“TMRPA”), Reno, Sparks and Washoe County in May 2010.

The Washoe County Consensus Forecast is adequate for 20-year, county-wide population projections, but it is not adequate for facility planning as performed by public purveyors and other water-related utilities or for disaggregation to utility service areas.

A Regional Water Balance Flow Diagram has been developed, which is a graphical representation of the existing conditions (Figure 6-2) and the projected 2030 future conditions (Figure 6-3) for the water supply, wastewater treatment, reclaimed water and wastewater disposal requirements. The following conclusions can be drawn from this evaluation:

### ***Water Resources***

Overall, the region has available water resources to meet the projected 2030 increase in demand particularly for the Truckee Meadows, Sparks and South Truckee Meadows planning areas. These water resources include the *TROA* water supplies, the Fish Springs Water Importation Project, local basin groundwater supplies, and local tributary creeks including Galena, Thomas, Whites, Brown’s and Steamboat Creeks. In addition to these water resources, the region has reclaimed water resources available for multiple uses from TMWRF, STMWRF, RSWRF and Cold Springs Water Reclamation Facility (“CSWRF”).

In several planning areas, however, there are water supply imbalances that will need to be addressed over the long term. In particular, the demands from domestic wells and permitted municipal groundwater pumping in Cold Springs Valley, Lemmon Valley and Spanish Springs Valley exceed the respective State Engineer estimates of perennial yield of each basin. This is an issue that affects both existing and future water users, and exists under both current and projected 2030 conditions.

There will continue to be local area impacts within portions of these areas where mitigation of groundwater level declines and impacts to shallow domestic wells will continue to be necessary. The Mt. Rose fan area is an example of this situation.

### ***Wastewater***

Long term disposal and reuse of treated effluent will be a challenge throughout the different planning areas. Cold Springs and Lemmon Valley generally have sufficient disposal capacity to meet the projected needs until 2030. However, future disposal options will need to be identified to accommodate planned development beyond the 2030 time horizon.

In the Central Truckee Meadows, Sparks and Spanish Springs areas, discharge to the Truckee River through TMWRF may be limited in the future by several constraints. Roughly 7,700 af of additional disposal capacity will be required.

In the South Truckee Meadows area, 100 percent of the reclaimed water is used for irrigation. Based on the 2030 flow projections, approximately 5,700 af of additional water reclamation or disposal capacity will be required.

### **Water Conservation Plan - Efficient Use of Water**

Water conservation ordinances will be retained by each of the jurisdictions in the Planning Area. All public purveyors in the Planning Area are essentially fully metered.

Increased use of reclaimed water and other non-potable water sources may be implemented subject to federal, state, local and WCDHD regulations, and to the extent supplies are available from TMWRF, RSWRF and STMWRF.

Additional conservation actions during droughts will be required when Floriston rates cannot be met during the irrigation season; however, there will be sufficient water for essential public health and safety needs, even during the worst drought years or during an emergency event.

TMWA has succeeded in retrofitting its flat-rate-residential services to meters thereby enabling TMWA's Board of Directors to modify the current watering schedule from two-day-a-week to three-day-a-week watering. Detailed studies indicated that (1) more than one-half of all customers currently water more than twice a week; (2) a change from two-day-a-week to three-day-a-week watering would not be expected to increase peak day water demand, and in fact may result in a decrease in peak day water use; and (3), total water use during the peak week would not be expected to change. Based on these studies and the fact that TMWA's system is essentially metered (fulfilling a TROA water conservation requirement), TMWA revised its watering schedules in 2010.

### **Cost and Financing**

At present, the need to invest in new facilities for additional capacity to serve new development has diminished. Over the last several years, there has been a decrease in both water use and flows to the wastewater treatment plants. This reduction in water demand and wastewater flow has created under-utilized capacity within major facilities. This excess capacity will allow the utilities and local governments to defer major capital expenditures for new capacity. This is in

sharp contrast to the projected expenditures reported in the *2009 Regional Water Plan Amendment*.

The need to provide for on-going repair and replacement of existing infrastructure remains a high priority. Approximately \$144 million per year is projected to be spent on all water-related improvement projects over the next five years. Much of this funding is intended for implementation of the Truckee River Flood Project (“Flood Project”), and for existing facility repair and replacement programs. The timing of these improvements, both capital expenditures for existing and new, will be pursued as funding becomes available based on prioritization of need. Projected five-year cost requirements for water, wastewater and storm water facilities are shown below, in millions of dollars:

	User Rates*	Developer Fees	Sales Tax	Total
Washoe County	\$36.2	\$13.1		\$49.3
City of Reno	99.3	11.5		110.8
City of Sparks	68.8	12.5		81.3
Truckee Meadows Water Authority	64.4	10.5		74.9
SVGID	1.5	3.4		4.9
Truckee River Flood Project	375.0	0.0	25.0	400.0
<b>Total</b>	<b>\$645.2</b>	<b>\$51.0</b>	<b>\$25.0</b>	<b>\$721.1</b>

\* Includes funding from grants and loans

Based on “typical costs” for water rights, water connection fees and sewer connection fees, the estimated costs per equivalent residential unit (“ERU”) for new water and sewer service are estimated as follows:

Water Rights	\$4,700
Water Connection Fees	5,200
Sewer Connection Fees	5,900
<b>Total Developer Fees</b>	<b>\$15,800</b>

Local governments and utilities plan for the ongoing repair and replacement of the existing infrastructure, which is critical to provide essential public health and safety services, and maintain the useful life of the infrastructure assets as a whole. Roughly \$50 million per year should be reinvested to maintain the existing water and wastewater utility assets. This corresponds to the estimated annual and monthly rate amounts shown below. Significant portions of these costs are being collected in existing rates; however, the actual amounts reinvested are determined by the specific rate and fee setting practices adopted by the local governments and utilities.

User Rates	Annual per ERU	Monthly per ERU
	\$300	\$25

Municipal systems providing water, wastewater, effluent, storm drain and flood control services, in operation for most of 100 years, have been expanded and upgraded over time to provide additional capacity and meet increasingly stringent regulatory requirements. In total, the asset value of the community’s investment in water and wastewater infrastructure is on the order of

\$2.5 billion, as shown below:

	Estimated Value	Annual R&R Funding Needs*
City of Reno	\$1 billion	\$20 million
City of Sparks**	460 million	5 - 9 million
Washoe County DWR***	437 million	9.5 million
TMWA	600 million	11 - \$13 million
SVGID	45 million	0.5 million
<b>Total</b>	<b>\$2.5 billion</b>	<b>\$46 - \$52 million</b>

\*Actual amounts may vary based on actual revenues and prioritization of needs

\*\*Estimated values based on TMWRF shared capacity 31.37% and Reno's \$1 billion asset value projection, and assumed 1% to 2% R&R funding level

\*\*\*Includes STMGID

### ***TMWA - WCDWR Consolidation Analysis***

The *System Planning and Engineering Preliminary Assessment Report* ("PAR") concluded that integrated planning and operation of water system facilities could improve reliability, water quality and service levels for customers; and potentially result in decreased operating and/or capital costs as compared to stand-alone water systems, particularly in the South Truckee Meadows.

## **4. Issues and Action Items**

Current and future issues affecting the Planning Area identified in various chapters of this *Plan* are summarized in the final chapter. Although numerous issues are identified and over 50 actions are proposed, shown in bold print below, only 21 are identified as needing near-term WRWC/NNWPC activity (see Table 9-1, page 9-36). These 21 Proposed Action Items, identified below in ***bold italicized*** print following "◆", are intended to guide the focus and activities of the WRWC and NNWPC over the next five years.

### **Municipal Water Resources**

#### ***Central Truckee Meadows***

TMWA developed and adopted its *2005-2025 Water Resource Plan* ("2025 WRP") in March 2003. In December 2009, TMWA's *2010-2030 Water Resource Plan* ("2030 WRP") was adopted following plan review, update, and/or modification of its water resource planning and management strategies due to a number of key events that have occurred since adoption of the *TMWA 2005-2025 WRP*, which include:

- Legislative directives modified regional water resource planning for the Truckee Meadows and led to the creation of the WRWC, which needs TMWA's latest water resource strategies adopted and available to be incorporated into the *Regional Water Plan* that is due January 1, 2011;
- Economic changes of the past few years at the national, state and local level have affected the growth activity and patterns for the Truckee Meadows resulting in a need to examine current population trends and their potential impact on water demands and resource requirements;
- The five Mandatory Signatory Parties (TMWA, PLPT, California, Nevada, and the United States) and seven other parties signed *TROA* on September 6, 2008; and

- Retrofit of more than 98 percent of the original 44,651 flat-rate water services that were required to be retrofit with water meters as part of the 1989 *Negotiated River Settlement*.

### **Proposed Action Items**

- ◆ ***Participate in Bureau of Reclamation (“BOR”) climate change study for the Truckee River watershed, expected to commence in 2011.***
- ◆ ***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.***
- ◆ ***Adopt the TMWA 2030 WRP into the Regional Water Plan.***

### ***South Truckee Meadows***

In 2002, 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, 2002) 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 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 STMWRF and TMWRF
- Allow development to proceed in a phased approach, keeping upfront capital costs low and total water service costs competitive, and provide reliable and economical utility service to the South Truckee Meadows
- Promote system integration, conjunctive use and expand reclaimed wastewater service to maximize the efficient use of water resources and facilities

Water supply needs also included consideration of existing and future domestic wells in the area. As presented in Section 6.3, Water Balance Model, the available groundwater resource is not over-utilized; however, relatively shallow domestic wells that penetrate the upper portion of the aquifer will continue to be affected by water level declines as a result of the combined pumping of both municipal and domestic wells.

Since completion of the 2002 *South Truckee Meadows Facility Plan*, a number of changes in the basic planning data made an update to the water facility plan necessary. Changes included modifications to planned land uses and planning area, unit demands, growth rate and changes in the location of available water resources. The draft *South Truckee Meadows Water Facility Plan Update* (ECO:LOGIC, 2009):

- Revises projected water demands based on the current planning area, existing and planned land uses and accepted unit demands.

- Updates the recommended water supply scenario presented in the 2002 *South Truckee Meadows Facility Plan* based on revised demands, new facility and water supply information, phasing plans and updated groundwater pumping projections.
- Incorporates groundwater modeling analyses to evaluate potential impacts to groundwater levels given new pumping scenarios and evaluates potential mitigation measures to groundwater drawdown if required.
- Updates the South Truckee Meadows and Hidden Valley water distribution system hydraulic models with current demand projections and water supply sources.
- Provides planning level opinions of probable cost for recommended facilities with project considerations and cost projections consistent with the requirements of NRS 278B.

#### **Proposed Action Items**

- **Continue development of the tributary creek water exchange program.**
- **Continue development of a plan to mitigate future groundwater level declines and potential impacts to domestic wells.**

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

The WCDWR 2009-2028 *Draft North Valleys Water Facility Plan* (ECO:LOGIC, 2009) identifies the water resources necessary to serve the WCDWR service areas. These supplies are fully developed (local groundwater, imported Truckee River water, and imported Fish Springs Ranch groundwater); however, the infrastructure necessary to distribute these water supplies is underdeveloped. The significant effort for the Lemmon Valley area over the coming 20-year planning horizon is to develop the infrastructure necessary to distribute the water supplies to planned growth areas.

#### **Proposed Action Items**

- **WCDWR and TMWA should develop a facility and financing plan for the required distribution system infrastructure in Lemmon Valley, including improvements necessary to integrate and utilize the Fish Springs water supplies for existing and future customers.**

#### ***Cold Springs***

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 2030 Regional Water Balance identifies a water supply imbalance 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 2030 conditions.

Plans for proposed water facilities are not integrated with the existing Utilities Inc. water system. Potential infrastructure savings could be realized with a conjunctive use operation of the two water systems.

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.

#### **Proposed Action Items**

- **A facility plan needs to be completed 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.**
- **A comprehensive water resource plan needs to be prepared for Cold Springs and portions of the Long Valley hydrographic basin to estimate the perennial yield for the Water Baseline and the 2030 Regional Water Balance.**

#### ***Spanish Springs***

Spanish Springs Valley includes water service areas within the jurisdictions of Sparks and Washoe County. The portion of the valley within the Sparks Sphere of Influence is served by TMWA from a combination of Truckee River water, Truckee Meadows groundwater and Spanish Springs groundwater pumped from TMWA wells. This portion of the hydrographic basin is managed in conjunction with TMWA's overall resource planning. WCDWR provides water service to its service areas in the unincorporated areas of the valley using local groundwater recently augmented with imported TMWA water from the Truckee Meadows basin.

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, 2004), and the *City of Reno and Washoe County TMSA/FSA Water, Wastewater and Flood Management Facility Plan* (ECO:LOGIC, 2007) are related to future water demands as a result of growth in the unincorporated area, water quality impacts due to existing growth and diminishing groundwater recharge:

- Allocation of groundwater resources in Spanish Springs has resulted in a situation where water rights and cumulative groundwater pumping by all entities exceeds the perennial yield of groundwater resources.
- Land use changes from irrigated agriculture to residential, commercial and industrial uses result in reduction of recharge occurring from surface water irrigation via the Orr Ditch, potentially exacerbating groundwater deficits.

In addition, based on the 2030 Regional Water Balance presented in Chapter 6, a water supply imbalance will need to be addressed over the long-term.

#### **Proposed Action Items**

- **Develop a long-term groundwater management strategy. Stakeholders include WCDWR, TMWA, the Sky Ranch Water Company, the City of Sparks, domestic well owners, the Red Hawk Golf Course, the Granite, Sha-Neva and Donovan quarry owners and other water rights owners.**



- **Monitor groundwater pumping and aquifer water levels to avoid long-term over-pumping.**
- **Continue implementing phased conversion of areas with high densities of septic tanks to community sewer system as funding is made available.**

### ***Lower Truckee River***

Industrially zoned lands are concentrated in the Mustang and Patrick / Tracy areas. Existing wells are low volume producers, although there are well locations that show promise. Planning evaluations concluded that the use of existing wells has a lower overall cost than importation of water from Sparks, even with expected treatment requirements to meet drinking water standards. Currently, the development of a technology park is being proposed that contemplates the use of 4,000 afa of TMWRF reclaimed water via a new pipeline. The reclaimed water would be used for cooling a generation complex to supply dedicated power to a data center technology campus. Initial water service would be provided by wells using 1,125 af of permitted groundwater rights.

### **Proposed Action Items**

- **Update the Water and Wastewater Facility Plans for East Truckee Corridor that includes analysis of the current development proposals and approved development potential within the Truckee Meadows Service Areas boundary**
- **Coordination with Storey County regarding existing commitments and future potential demands for the entire Tracy Segment hydrographic basin**
- **Development of a position statement regarding construction of surface water treatment facilities in the Lower Truckee River**

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

- 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 “protectible interest” to protect their water supply from unreasonable adverse effects caused by municipal, quasi-municipal or industrial uses which cannot be reasonably mitigated (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)).

### **Proposed Action Items**

- **WCDWR is expected to complete the reassessment of its well mitigation approach and finalize the programmatic mitigation program.**

### ***Water Conservation***

Chapter 7 describes the benefits of water conservation and characterizes the status of water conservation efforts to date. There are some unique issues regarding water conservation in the TMWA system that affect the use of conserved water; see *TMWA 2030 WRP*. 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 (“TAC”) 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). 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.

## **Proposed Action Items**

- ◆ ***Continue implementation of conservation measures to achieve Base Case conservation***

## **Wastewater Management**

### ***Central Truckee Meadows***

TMWRF provides centralized wastewater treatment for most of the community, including development in the central Truckee Meadows and portions of adjoining basins. To meet NPDES permit requirements for discharge to the Truckee River, TMWRF must achieve a complex 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”), a design capacity of 40 MGD, and currently operates at about 28 MGD. The actual maximum-month-flow design capacity of 40 MGD is due to increased biological oxygen demand (“BOD”) wastewater strength resulting from indoor water conservation (low flow fixtures and water meters) and inflow and infiltration (“I&I”) 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 vs. 398,000) because the actual flow per residential unit is less than historical flow rates.

During the irrigation season, typically April through September, approximately 4,000 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 both RSWRF and STMWRF. 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.

- Options to achieve state water quality standards (“WQS”) in the Truckee River include Total Maximum Daily Load (“TMDL”) review and revision, coordination with PLPT Water Quality Control Plan criteria, facility modifications at TMWRF, implementation of pollutant trading projects and implementation of lower Truckee River restoration projects. Further analyses could lead to a more complete understanding of the river system and possibilities for increased flexibility in TMWRF discharge permit conditions.
- Constraints on discharge to the Truckee River due to NPDES discharge permit requirements related to 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, 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.

- Based on the 2030 flow projections identified in the Regional Water Balance presented in Chapter 6, given that approximately 33,600 af is discharged annually to the river and 4,000 af of reclaimed water is used for irrigation, roughly 7,700 af of additional disposal capacity will be required.

#### **Proposed Action Items**

- ◆ ***Continue Third Party review of the 1994 nutrient TMDLs and applicable WQS in coordination with state and federal regulatory authorities, and the PLPT's water quality and quantity goals, to demonstrate that continued discharge to the Truckee River from TMWRF is an environmentally sound practice.***
- ◆ ***Continue technical, modeling and legal work to support the TMDL and WQS review and discussions with NDEP and Environmental Protection Agency ("EPA").***
- ◆ ***Continue working with the Third Parties to facilitate public outreach, in consultation with NDEP and EPA, and obtain input from affected stakeholders at key decision points in the TMDL and WQS review and revision process.***
- ***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.***
- ◆ ***Evaluate the merits of regional integrated solutions between TMWRF and STMWRF for the treatment and disposal of wastewater.***

#### ***South Truckee Meadows***

WCDWR 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 disposal is handled via pumping to TMWRF for treatment and disposal.

#### **Proposed Action Items**

- ◆ ***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 storage and recovery ("ASR") and cooling water for energy generation facilities.***
- ***In regard to the potential regional implications of reclaimed water ASR and indirect potable reuse, 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.***
- ◆ ***Evaluate the merits of regional integrated solutions between TMWRF and STMWRF for the treatment and disposal of wastewater, including funding considerations.***

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

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. Effluent is either discharged 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 (“LVWRF”). 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, 2005), and the *City of Reno and Washoe County TMSA/FSA Water, Wastewater and Flood Management Facility Plan*, (ECO:LOGIC, 2007), 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. 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.

#### **Proposed Action Items**

- ◆ ***Continue to evaluate the merits of regional integrated solutions between RSWRF and CSWRF for the treatment and disposal of wastewater, including funding considerations.***
- ◆ ***Continue to work with NDEP on proposed effluent ASR regulations, including additional groundwater modeling assessments of aquifer storage and recovery capacity for long-term viability, and establishing appropriate water quality standards for the protection of water resources, public health and the environment.***

### ***Cold Springs***

CSWRF is owned and operated by the WCDWR, and is permitted to treat a peak month average day flow of 0.7 MGD. 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 (2007) 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: long term water supply availability within the basin, taking into consideration demands from both municipal and domestic wells; capability to assess water quality considerations, including total dissolved solids, nitrate, fate of the effluent disposed by the rapid infiltration basins, and the potential for reclaimed water ASR; aquifer storage capacity; and coordination with the White Lake 100-year flood level.

### **Proposed Action Items**

- ◆ ***Continue to evaluate the merits of regional integrated solutions between CSWRF and RSWRF for the treatment and disposal of wastewater, including funding considerations.***
- **Update and refine the existing WCDWR groundwater model for Cold Springs to address interrelated groundwater, surface water and wastewater issues.**

### ***Lower Truckee River***

Significant undeveloped, industrial zoned lands are located in the Mustang and Patrick / Tracy areas, including the 2,205 acres adjacent to Interstate 80 East, being studied for the development of a technology park. The land owner and developer contemplate the use of 4,000 afa of TMWRF reclaimed water to be utilized for water cooling an energy generation and data center complex. There is also significant development potential on the Storey County side of the river. This area includes existing industrial development such as Kal Kan and Kaiser Aluminum, and continued commercial and industrial development within the Tahoe Reno Industrial Center.

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 this *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 biological nitrogen removal, with subsurface disposal and/or landscape irrigation.

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 the City of Sparks, Washoe County and Storey County is needed to ensure long-term water quality objectives for the river are maintained.

### **Proposed Action Items**

- **As this area of Sparks and Storey County continues to grow, it will be important to monitor groundwater and surface water quality to check for non-point source pollutants entering the Truckee River.**
- **Revisit discussions among Washoe County, PLPT, and the City of Fernley to seek an area-wide water and wastewater strategy for lower Truckee River users.**

### ***Septic Systems and Water Quality***

The WCDWR 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 groundwater, 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 ground-water 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 four 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

#### **Proposed Action Items**

- ◆ ***Continue to collect data and develop regional strategies to address existing and future nitrate contamination due to high densities of septic systems.***

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

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 (“SWMP”) for the five-year permit term within 18 months of the issue date or by November of 2011. This update warrants an evaluation of the program element needs, activities and schedule from the present to 2015.

The Storm Water Permit Coordinating Committee (“SWPCC”) anticipates that, based on talks with NDEP and review of national regulatory trends, a WLA will be assigned to storm water in the future. It is not yet known how or when a storm water WLA will be implemented, or what constituents will be covered.

#### **Proposed Action Items**

- ◆ ***SWPCC to work with agency staff, consultants and regulators and prepare a program update per the conditions of the May 2010 Storm Water Discharge Permit.***
- ***Continued SWPCC communication with NDEP is necessary regarding the anticipated future storm water WLA.***

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

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 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 Truckee River water rights to TMWA for M&I supplies.
- 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 new surface water M&I supplies.
- Allocation of water rights to facilitate groundwater recharge using surface water and/or, possibly in the future, purified reclaimed water.

To independently satisfy these primary uses for water rights, plus others, could eventually require more water rights for which the river and its tributaries can provide. The many competing demands 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 available water resources to meet the projected demand increases; however, there are water supply 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 issue is how to efficiently manage the use of the resources and minimize the resulting impacts, and who shares in the cost of mitigation.

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.

### **Proposed Action Items**

The NNWPC, TMWA, Washoe County, and the Cities of 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:

- **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.**
- **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.**
- **Finalize and implement recommendations developed from the potential consolidated management of TMWA and WCDWR water rights and water resources.**



- **Continue the analysis and development of non-structural measures to improve Truckee River water quality, enable increased TMWRF discharges, and ensure the future sustainability of the river.**
- **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.**
- ◆ ***Develop cooperative management strategies among local governments, reclaimed water providers and water purveyors that maximize the benefits of available reclaimed water resources.***
- ◆ ***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.***

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

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 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.

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, 2010).

### **Proposed Action Items**

- ◆ ***Continue working with TMRPA staff to strengthen appropriate linkages between the Regional Plan and the Regional Water Plan***
- ◆ ***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***
- ◆ ***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***
- ◆ ***Coordinate with local land use planning agencies to address rural groundwater basin imbalances***

## **Local Government Drainage Programs**

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 to shift funding 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. flood plain management, adjoining facilities, and the need to form utility districts, or other types of funding districts, to generate revenue for flood management services.

### **Proposed Action Items**

- **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.**

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

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

**Joint Powers Authority (“JPA”):** Reno, Sparks and Washoe County are discussing the development of an interlocal cooperative agreement that would create a JPA to govern the flood project consistent with the provisions of recent state legislation. Certain emergency, regulatory, and revenue powers are contemplated. Revenue powers would include the ability to issue bonds similar to other municipalities. Regulatory functions may include measures consistent with existing development codes to protect the flood management facilities and mitigate the adverse impact that new development may have on flooding and on the level of protection the facilities are designed to provide. The plans and regulatory measures would be developed in collaboration with the JPA members’ planning staffs and proposed, as appropriate, for approval and inclusion in the local government development codes. Regulatory functions may also include establishing a flood impact analysis procedure and process to measure the possible impact of land uses and development projects on the flood management facilities. This process may utilize a regional hydrologic modeling tool.

**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 FEMA standards for the National Flood Insurance Program (“NFIP”) 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. Critical Flood Pool (Zone 1) is (or will soon be) addressed in local ordinances, Zones 3 and 4; however, will need attention before a funding agreement can be executed with the ACOE. Development of a Regional Hydrologic Model will be needed for this effort. Development that displaces flood plain storage outside Zone 1 (but within the

area flooded in 1997) and that occurs after the time current conditions are set (but before the Flood Project is finished) is an ongoing concern.

**Flood Plain Management Plan:** The Flood Project, in order to receive federal cost share funds through the ACOE, is required to have in place and ready to implement, a flood plain management plan that deals with the impacts to the Flood Project caused by changes in the watershed. Development of a Regional Hydrologic Model will be needed for this effort.

**Federal and Local Funding for the \$1.2 - \$1.6 Billion Project:** The Flood Project is the largest public works project ever undertaken in northern Nevada. The ACOE is expected to contribute more than half of the project cost and 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. It is expected that one or more "Flood Funding Areas" will be established over time to meet the funding need. The local sponsors are also discussing which of the proposed Flood Project elements could be built with local funds only and what level of protection that would provide.

**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 affect on flood flows in the Truckee Meadows.

#### **Proposed Action Items**

- **The parties to the Cooperative Agreement are expected to resolve issues and complete the JPA negotiations.**
- **Issues regarding flood plain storage in zone boundaries need to be addressed and ordinances to address Zones 3 and 4 will be needed.**
- **A Flood Plain Management Plan will need to be developed and submitted to the ACOE.**
- **Continue development of a regional hydrologic model.**

#### **Groundwater Remediation**

**PCE in Central Truckee Meadows:** Groundwater underlying the central Truckee Meadows is contaminated by tetrachloroethylene (also known as perchloroethylene or "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 WCDWR.

**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 gallons per minute ("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. 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. The potential exists for this contamination to migrate to municipal water supply wells; however, 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 the direction and oversight of NDEP (see Section 2.2.4).

#### **Proposed Action Items**

- **PCE in Central Truckee Meadows: Continue CTMRD implementation of the Remediation Management Plan (“RMP”), including treatment, monitoring, source management, outreach and administration.**
- **Sparks Solvent/Fuel Site (“SS/FS”): Monitor the effects of the new municipal well field to the north of the tank farm for changes in the local hydrodynamics and adjust the remediation strategy as necessary.**
- **PCE in Lemmon Valley: Continue remediation activities.**

#### **Groundwater Protection**

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).

#### **Proposed Action Items**

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

