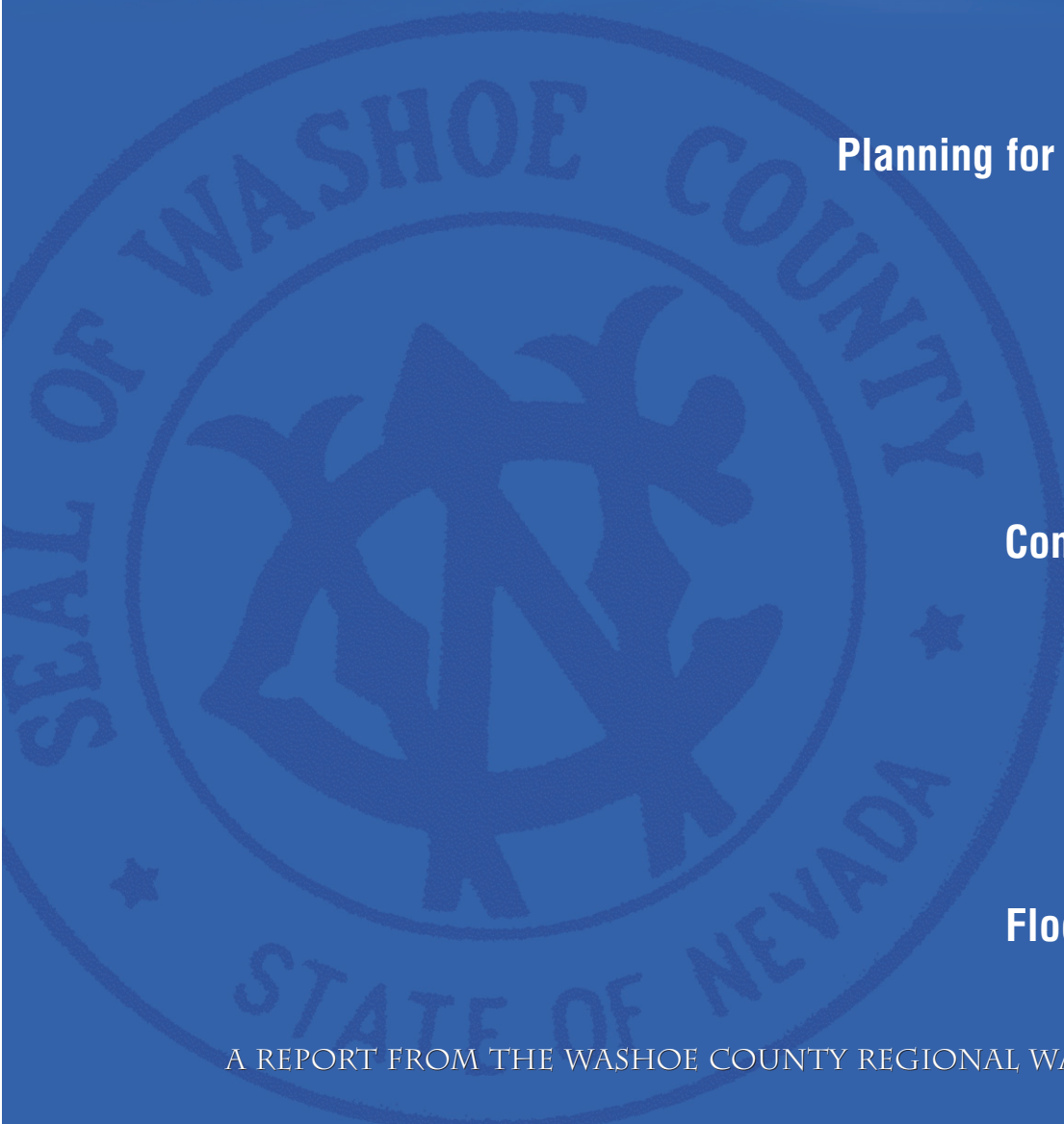


WASHOE WATER

SECURING WASHOE COUNTY'S WATER FUTURE WINTER 2005



Planning for the future



Conservation



Flood control



A REPORT FROM THE WASHOE COUNTY REGIONAL WATER PLANNING COMMISSION



WASHOE WATER

SECURING WASHOE COUNTY'S WATER FUTURE

Regional Water Planning Commission

Purpose - statutory authority and charge

Washoe County residents consistently rate water planning among the most important services provided by regional government. Frequent headlines about water for new growth and the threat of drought or flood keep these issues in the public's eye. Do we have enough water to serve all this growth? Why should I conserve water when it only goes to new developments? How can our community keep growing like this when I keep hearing we are out of water? These questions often are asked of planners and community leaders. The answers are not simple.

Local governments have understood the importance of coordinated water resource planning for many years. In 1995, Reno, Sparks and Washoe County approached the State Legislature with a proposal to create a commission having broad regional representation to do long-range water planning.

The Legislature responded with a new chapter in the Nevada Revised Statutes authorizing the creation of the Washoe County Regional Water Planning Commission (RWPC), which reports to the Board of County Commissioners, and charging it with developing a Comprehensive Regional Water Management Plan to provide for the current and future needs of the region. The plan is required to cover water supply, water quality, wastewater, storm water drainage and flood control. The Plan also must conform to federal and state laws, the State Water Plan and the Truckee Meadows Regional (land use) Plan. In addition, the RWPC is to review plans for major water facilities, such as water and wastewater treatment plants, water mains and sewer interceptors, for conformance with the Regional Water Management Plan.

RWPC Membership and Representation

The nine-member Regional Water Planning

Plan for flood control approved

Truckee Meadows officials take aim at area water wasters

Water in the Truckee Meadows Is there enough?

Commission oversees water planning for a geographic area covering about 1,200 square miles of southern Washoe County, extending from Washoe Valley to Warm Springs Valley and east to the Pyramid Lake Paiute Tribe Reservation boundary. By State law, the region excludes Tribal lands and the Lake Tahoe basin. Representatives and alternates are appointed by various public and private concerns from across the region. Three local governments, Reno, Sparks and Washoe County, are represented in addition to the Pyramid Lake Paiute Tribe. The Truckee Meadows Water Authority, Sun Valley General Improvement District and the Washoe County Water Conservation District also appoint members. A representative for owners of private domestic wells, and another for environmental, conservation and public concerns, make up the rest of the commission. In addition to the voting members and alternates, the commission has eight non-voting members, each also having an alternate.

Activities

Since its inception in 1995, the RWPC has pursued its mission with diligence, completing the 1995-2015 version of the Comprehensive Regional Water Management Plan in about one-and-a-half years. The RWPC's first plan, adopted in 1997, identified numerous issues that required either further study or implementation projects, which led to the completion of more than 40 studies, facility plans and projects over the following five years.

In 2001, the RWPC initiated a 5-year review that identified additional study topics. The resulting update, called the 2004-2025 Washoe County Comprehensive Regional Water Management Plan, integrates the findings and recommendations of those 40 studies, plans and projects and charts a 20-year course for the region's water, sewer, flood control and storm drainage.

RWPC committees

Jurisdiction and Agenda Committee —

Reviews items to be considered, and sets agendas for the RWPC's regular bi-monthly meetings, which are generally held the first and third Wednesday afternoon of the month.

Advisory Committee on Conservation —

Advises the RWPC regarding water conservation and recommends regional water conservation projects.

In addition to the two permanent committees above, short-term committees are formed from time to time to handle special topics, such as:

Groundwater Task Force —

Studied the problem of private domestic wells going dry and made recommendations for a program to assist well owners.

Flood Storage Volume Mitigation

Committee — Studying the volume of floodwater that can be stored in the Truckee Meadows without causing flood damage, and ways to mitigate development-caused decreases in storage volume.



From left: Erik Ringelberg, George Ball Jr., John Erwin, George Shaw, Wayne Seidel (vice chairman), Michael DeMartini (chairman), John Rhodes (legal counsel), Michael Cameron, Greg Dennis and Diana Langs.



WASHOE WATER

REGIONAL WATER PLANNING COMMISSION

Voting Members



City of Reno
 Greg Dennis
 Alternate: Terri Svetich



City of Sparks
 Wayne Seidel, Vice Chairman
 Alternate: John Gonzales



Washoe County
 George Shaw
 Alternate: Peter Krenkel



Domestic Well Owners
 Appointed by Washoe County
 Michael J. DeMartini, Chairman



Sun Valley General Improvement District
 Diana Langs
 Alternate: Barry Winzeler



Truckee Meadows Water Authority
 John Erwin
 Alternate: Catherine Hansford



Pyramid Lake Paiute Tribe
 Erik Ringelberg
 Alternate: Albert John Jr.



Environmental, Conservation and Public Concerns
 Appointed by Reno and Sparks
 Michael Cameron
 Alternate: Thomas Hultin



Washoe County Water Conservation District
 George W. Ball Jr.
 Alternate: Don Casazza

Non-voting members:

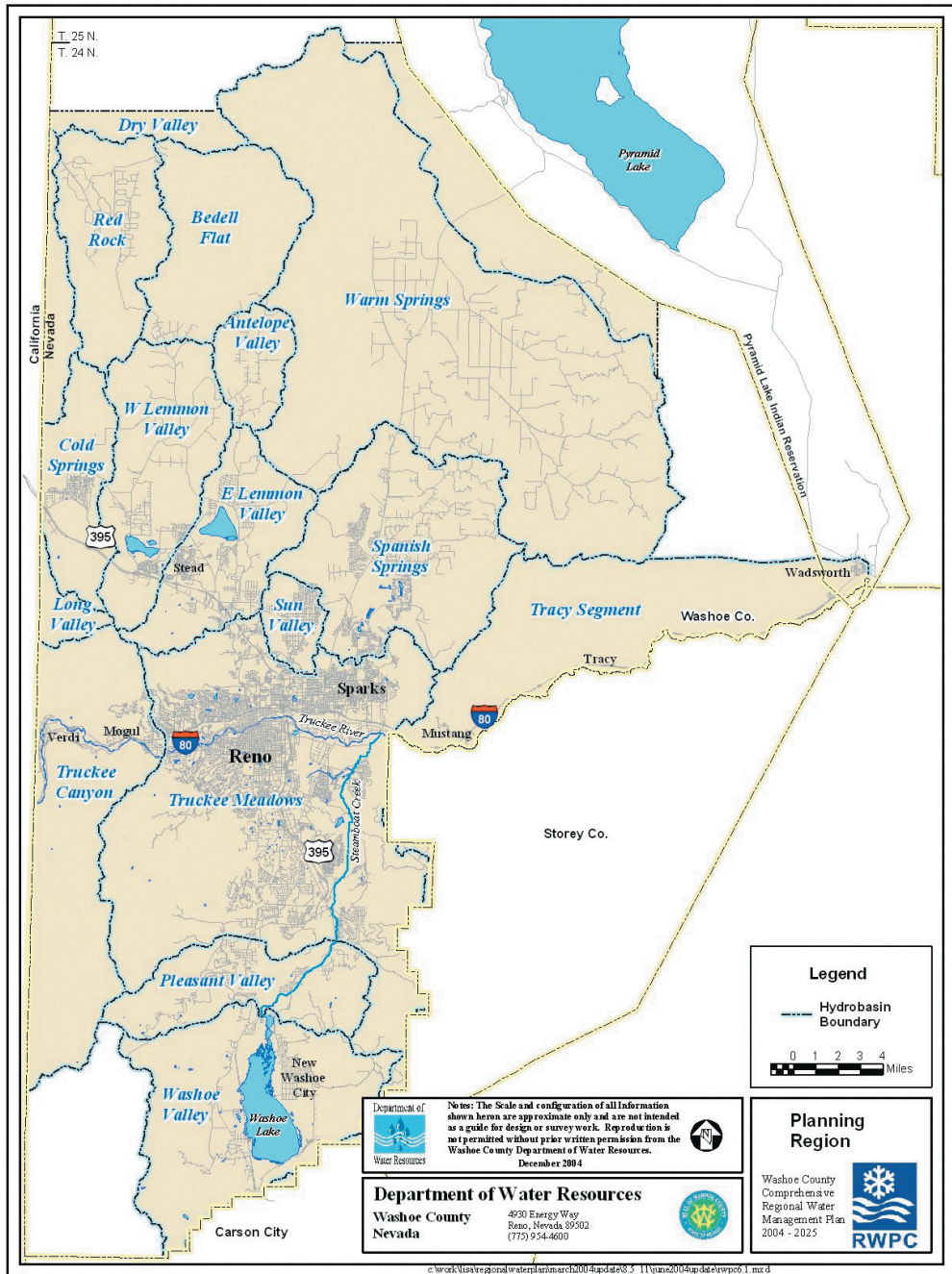
John R. Patterson, Public Utility Commission
 Alternate: Steve McGoff

Dale Stransky, Consumer Advocate, Office of the Attorney General
 Alternate: Tim Hay

Randy Pahl, State Division of Environmental Protection
 Alternate: Tom Porta

Tracy Taylor, State Engineer's Office
 Alternate: Kelvin Hickenbottom

Don Casazza, Carson-Truckee Water Conservancy District



Acknowledgments

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 Water Resources Planning Division staff
 GIS and Drafting staff
 ECO:LOGIC Consulting Engineers

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WASHOE WATER

REGIONAL WATER MANAGEMENT PLAN

Planning for Current and Future Needs

What's in the Plan?

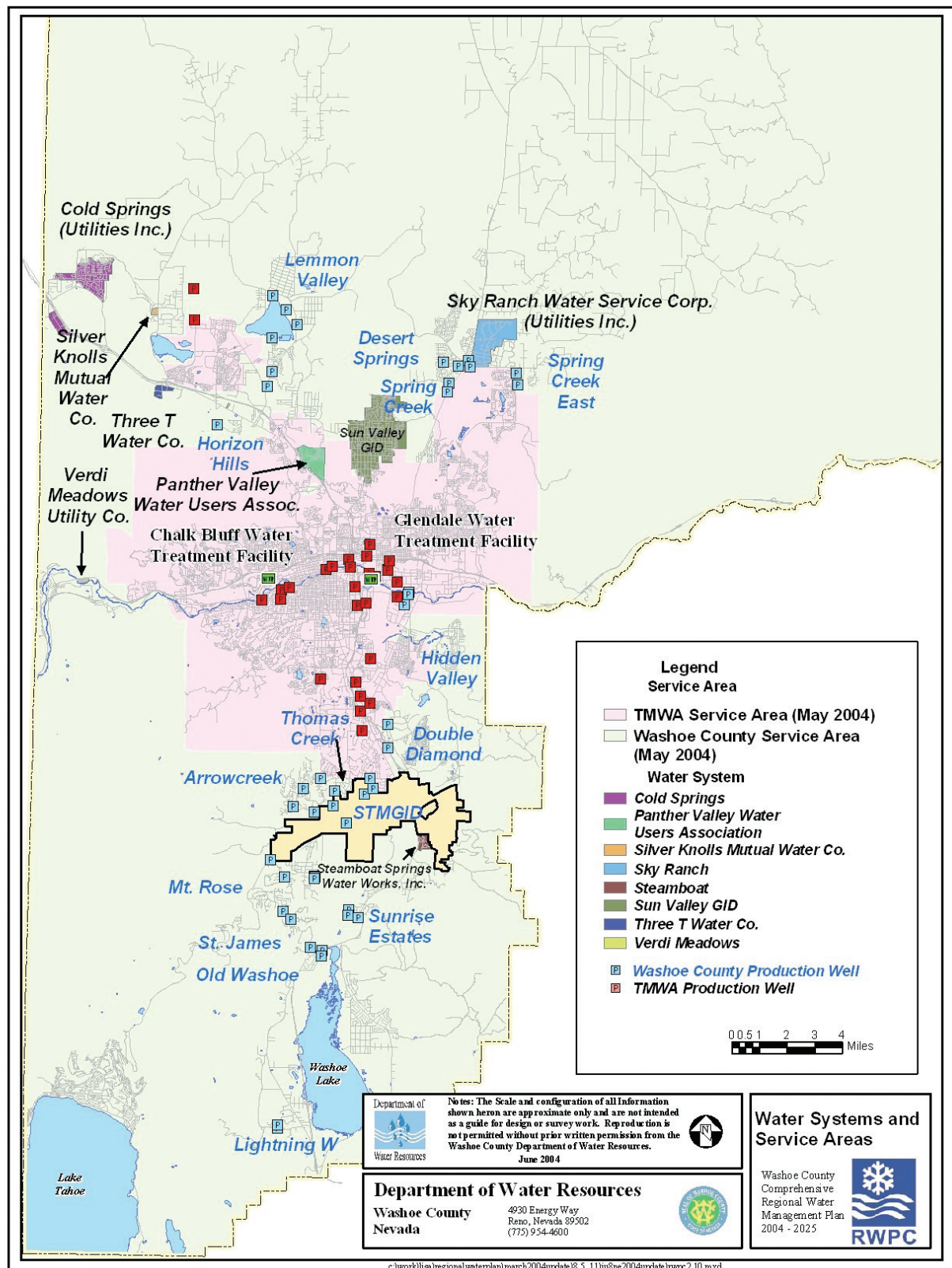
The Regional Water Management Plan covers current and future needs of the region with respect to water supply, water quality, wastewater and sewage treatment, flood control, storm water drainage and water conservation.

In addition to providing historical and background information on the above topics, the plan predicts population growth, water demands and wastewater flows for the various hydrographic basins that comprise the region. It also inventories water resources and water rights and seeks to balance them with the predicted demands. The need for the Truckee River Flood Management Project is emphasized in addition to the Regional Storm Water Quality Management Program. The water conservation chapter describes current and future conservation measures and establishes a new drought response plan. The plan opens with a compilation of water planning policies and criteria, and closes with a financial summary of anticipated facilities that will need to be constructed to meet future demands, and an action plan that prioritizes issues for future consideration and study.

Where does our water come from?

The Truckee River is the primary source of water supply for the central Truckee Meadows. Originating at the outlet from Lake Tahoe, the Truckee is fed from Donner and Independence lakes in addition to Prosser, Boca and Stampede reservoirs, all located in California. 2003 records show Truckee Meadows Water Authority (TMWA) diverted nearly 70,000 af (acre-feet) from the Truckee River for municipal supply.

The other source of domestic and municipal supply comes from groundwater pumped from the various hydrographic basins within





WASHOE WATER

REGIONAL WATER MANAGEMENT PLAN

the region. From Warm Springs and Red Rock Valley to Washoe Valley (see map on page 3), nearly every resident relies on groundwater for all or part of their water supply. Groundwater pumpage in 2003 by TMWA, Washoe County and several private water companies amounted to approximately 30,000 af. In addition, an estimated 9,300 af was pumped by domestic wells.

Plans for the future municipal supply include the use of tributary creek water in the south Truckee Meadows and possible importation of groundwater from northern basins for use in Lemmon Valley and nearby areas.

Where is it distributed?

Truckee River water is treated at TMWA's two water treatment plants — Chalk Bluff and Glendale — and delivered to connections in the Truckee Meadows, Sun Valley, the Stead area of Lemmon Valley and portions of Spanish Springs Valley.

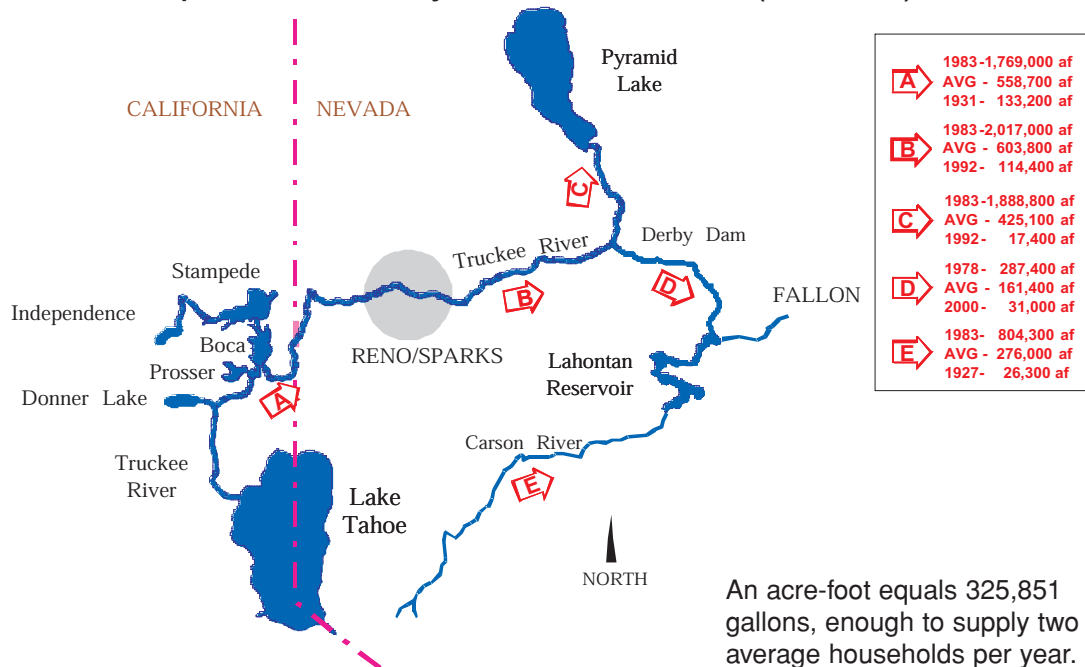
Groundwater is produced by either municipal supply wells or private domestic wells. It is generally used in the basin where it is pumped. Virtually all residents in Warm Springs Valley and Red Rock Valley use private domestic wells, as do most homes in Washoe Valley, Pleasant Valley and parts of the South Truckee Meadows, Lemmon Valley, Verdi and Spanish Springs Valley. Municipal water systems using groundwater serve connections in Cold Springs Valley, Spanish Springs Valley, Verdi, Lemmon Valley and South Truckee Meadows, including some of Pleasant Valley.

How reliable is our water supply?

TMWA, in conjunction with the RWPC, recently engaged in emergency water supply planning, and continues to refine its plans for unexpected events affecting Truckee River water quality. Wellhead protection planning is used to protect the quality of groundwater resources. Planning for arsenic removal is under way in advance of the new drinking water standard that takes effect in 2006.

Prior to the drought period of 1987-1994, planning for drought supply was done using a standard of withstanding the worst drought of record, which was the drought of 1928-1935. Since the drought of 1987-1994, currently the worst drought of record, the drought planning standard has been to withstand a drought worse than the worst drought of record. With a more conservative standard and more drought storage available, the region now is in better shape than in 1994.

Map of Truckee River System with Historic Flows (in acre-feet)



Source: TMWA



TMWA, in addition to drought reserves held in Donner and Independence lakes, has access to more water in Stampede and Boca reservoirs and injects water into the Truckee Meadows groundwater aquifers for use in dry years.

A new drought response plan calls for increased water conservation in the community depending upon the severity of the drought. TMWA water

management and water conservation in the community worked well enough last year that drought reserves were barely tapped in what was the fifth year of a drought cycle. Ultimately, the Truckee River Operating Agreement is expected to triple drought reserves for the Truckee Meadows, ensuring water supplies during future droughts.

Why Should I Conserve Water?

The RWPC is working with the region's water utilities, scientists and professionals to decrease indoor and outdoor water waste. Avoiding water waste is a sound practice for several reasons. The most apparent reason is water saved can be stored upstream or underground for future use in dry times. Aside from drought conservation, wise water use all the time makes good financial sense. If you pay metered rates, you save money every month on your water bill. Water system savings result from lower operating and energy costs and avoiding system expansions. Additionally, minimizing irrigation runoff saves street maintenance costs and helps prevent washing pollution into our waterways.

A common misconception is that water saved by current residents can be used for new growth. Not so. Water to supply new development is transferred from a former use, such as agriculture. If all agricultural water rights are someday transferred to municipal uses, continued growth will have to be supplied from new sources, not



WASHOE WATER

REGIONAL WATER MANAGEMENT PLAN

Reclaiming Water for a Variety of Purposes

Where does water go after we use it?

Water used indoors generally drains into either a regional sewage collection system or an individual septic tank.

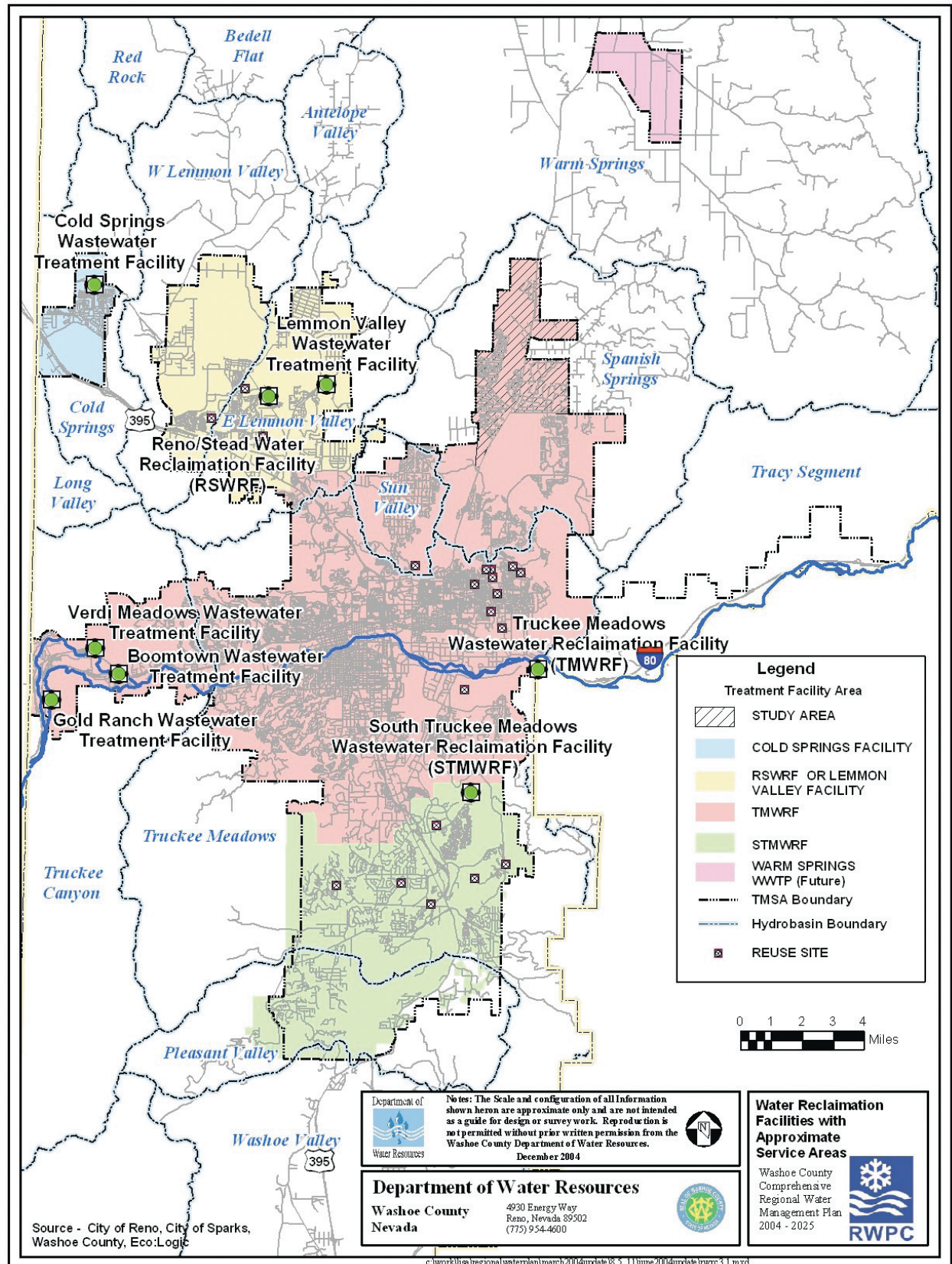
Most Reno and Sparks homes and businesses are connected to the Truckee Meadows Water Reclamation Facility (TMWRF), by far the largest in the region. Smaller facilities serve customers in the south Truckee Meadows, Stead/Lemmon Valley, Cold Springs Valley and Verdi areas.

Infrastructure expansions are expected to connect most of Verdi to TMWRF in the near future. Spanish Springs homes and businesses not already served by TMWRF will either be connected there or to a smaller facility in Spanish Springs Valley. An ongoing evaluation is expected to help with that decision in 2005.

Modern water reclamation facilities provide such an advanced level of treatment that the resulting effluent can be used for a variety of purposes including irrigation, industrial uses, stream and river flow augmentation, wetlands enhancement and even full-contact recreation.

Most treated effluent discharged from TMWRF flows into the Truckee River and is used to satisfy downstream water rights, including Pyramid Lake, and some is used to irrigate fields, parks and golf courses. South Truckee Meadows Water Reclamation Facility effluent is used 100 percent for irrigation while Reno/Stead effluent goes to irrigation and wetlands enhancement at Swan Lake. Other plants discharge to infiltration basins.

Septic systems do not provide a high level of treatment. Consequently, under certain conditions they can cause groundwater quality problems if too many are located in a small enough area. An example of this condition exists in Spanish Springs. To resolve it, there are plans to expand sewer service and remediate nitrates in Spanish Springs groundwater.





WASHOE WATER

REGIONAL WATER MANAGEMENT PLAN

Reducing Flood Damage

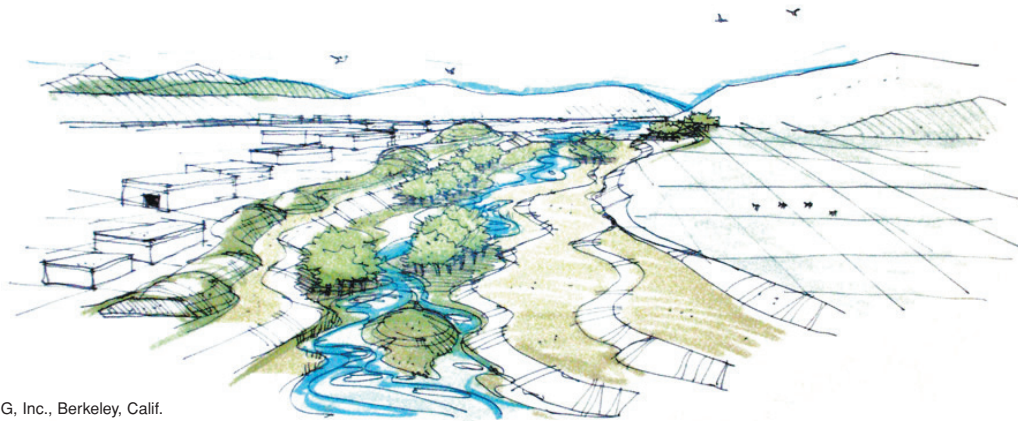
What is the status of the Truckee River Flood Management Project?

Eight years has passed since the Truckee River flooded on New Year's Day in 1997. The estimated \$680 million in physical damages and economic impacts are fresh in the minds of those who sustained losses. Truckee River flood management continues to be one of the Region's most complex water issues.

A few months after the 1997 flood, the residents of Reno, Sparks and Washoe County took on a significant challenge: develop and implement a flood management program that restores the health and vitality of the Truckee River while protecting communities on the river from flood damage.

In order to develop a flood plan acceptable to the public, Washoe County's Flood Control Manager, working with Reno and Sparks, created a community-based group in 2000 known as the Community Coalition for Truckee River Flood Management. The Coalition, with representatives from the local governments, dozens of stakeholders and members of the public, works cooperatively with the agency that will eventually build the project, the Army Corps of Engineers.

We cannot prevent flooding, but by working with the river, we can reduce flood damage. Today,



Source: MIG, Inc., Berkeley, Calif.

Terraced River Banks

much of the natural floodplain for the Truckee River has been developed or protected for agriculture. As a result, the natural process of flooding, where floodwater spills over the riverbanks and spreads out on the floodplain, is greatly diminished. The Truckee River Flood Management Project, however, offers the opportunity to restore some of the natural flooding processes, allowing water to spread out naturally across designated open lands during a flood, rather than inundating the developed areas we are working to protect. The Coalition's "living river" concept can be realized with sensitively designed and located flood barriers combined with benching

and terracing techniques.

Restoring natural flooding processes requires land. To take advantage of cost savings made possible by purchasing land sooner rather than waiting for the entire project to be designed, Washoe County developed the Early Land Acquisition Program. The program focuses on keeping highly developable land open while pursuing acquisition of parcels identified as necessary regardless of the final flood project design. In October 2004, The County acquired the first critical parcel, the historic East Steele Ranch at the intersection of Mill Street and South Rock Boulevard in Reno.

Can our community keep growing?

Planning for the region's future water needs is among the most important reasons the RWPC exists. Water, wastewater, flood control and storm water drainage services in Washoe County are provided by a variety of local governmental and private entities. Additionally, thousands of residents serve their own water and wastewater needs with private domestic wells and septic systems. Compiling plans from each service provider and integrating them into a comprehensive regional water plan is a complex, but necessary task. The goal is to chart a course for the future while maintaining consistency with local and regional land use plans.

As our community grows, water purveyors will optimize the use of available water resources. Conversion of agricultural water rights from the Truckee River, tributary streams and groundwater will continue as the market allows. Expansion of infrastructure and treatment plants, such as Chalk Bluff and those planned in the south Truckee

Meadows, will satisfy much of the growth. However, in order to build-out all of the zoning and land uses shown in local and regional plans, new sources of water will need to be developed to serve an estimated regional demand of 147,800 acre-feet in 2025. Plans for groundwater importation from the north currently are under environmental review. The RWPC and local water purveyors are working with the State Engineer to keep an inventory of water rights and safe water yield to avoid over-committing our water resources.

Providing water for future growth, however, is only part of the picture. When new sources of water are introduced, a percentage ends up as treated wastewater effluent. Average annual wastewater flows are projected to range from 46.6 million gallons to 62.8 million gallons per day in 2025. Providing adequately for disposal or reuse will require careful planning for water quality protection, higher levels of treatment, intergovernmental cooperation and a good measure of creativity.

Increased discharge to the Truckee River is limited by water quality standards, but restoration of a sustainable river ecology should offer future flexibility. Additionally, using highly treated effluent to offset diminishing groundwater aquifers is becoming commonplace in other western communities, and is being studied locally. Planning for wastewater disposal in the Lemmon Valley area and plans to address overly dense septic systems are high priority RWPC action items.

Plans for Truckee River flood management are moving forward and promise to provide adequate protection for existing and future residents. Mitigating floodplain storage losses is a high priority and planning is under way. Master planning for flood control outside the Truckee River basin also is a high priority action. A regional flood control master plan framework is under development and will address the planning needs in these parts of the region.



WASHOE WATER

REGIONAL WATER MANAGEMENT FUND PROJECTS

Regional Water Management Fund Projects, Studies and Facilities Plans

Annual Revenue and Expenditures

The Regional Water Management Fund was created in 1995 to finance the Regional Water Planning Commission's work. A 1.5 percent surcharge appears on nearly all retail water bills in the region.

The fund generates a little more than \$1 million per year, which pays for studies, plans and implementation projects recommended by the RWPC to the Washoe County Board of Commissioners, which approves fund expenditures.



It is important to note that the fund does not pay for RWPC staffing; the Washoe County Department of Water Resources has provided this service since 1995. Using the Regional Water Management Plan as a guide, the RWPC sets priorities and a budget every year and then requests proposals from private, public and non-profit entities to conduct studies, develop plans and implement projects according to its priorities.

Regional Water Management Fund Revenue and Expenditures

	Revenue	Project Expenditures	General and Administrative Expenditures
Fiscal Year 99-00	885,552	775,918	7,721
Fiscal Year 00-01	956,945	756,481	14,905
Fiscal Year 01-02	979,196	827,715	26,823
Fiscal Year 02-03	995,675	1,601,809	32,312
Fiscal Year 03-04	1,199,366	1,842,451	47,396



Project Name

Amount (\$)

Restoration

Steamboat Creek Restoration Outreach Program	.52,100
Evans Creek (Bartley-Anderson) Stream Restoration Design	.63,800
McCarran Ranch River and Wetlands Restoration Project & BMP Handbook	.214,100
Facilitate Cooperative Agreement for Lower Truckee River Restoration	.60,000
Steamboat Creek Realignment Project at Hidden Meadows	.21,000

Wastewater and Water Quality

Spanish Springs Valley Groundwater Nitrate Study	.122,700
Fernley-Wadsworth Solute Transport Study	.177,400
Strategies to Reduce Cost of Septic Tank Conversions to Sewers	.75,000
Develop WARMF Model for Upper Portion of Truckee River	.75,000
Regional Stormwater Quality Management Program	.49,000
Analysis of Microbial Water Quality in Non-Potable Recycled Water	.15,000
Mercury Investigation in Steamboat Creek	.29,600
Truckee River Watershed Assessment and Protection Program	.221,200
Spanish Springs Valley Nitrate Groundwater Characterization & Individual System Study	.130,000
Truckee River Non-Point Source Pollutant Trading Analysis	.100,000
N. Valleys Effluent Disposal Evaluation	.133,400

Water and Wastewater Facilities Planning

Facility Plans for Industrial Zoned Lands along Lower Truckee River	.98,000
South Truckee Meadows Facility Plan	.261,500
Analyze & Model N. Valleys Water System Integration	.25,000

Policy Development and Plan Update

Washoe County Comprehensive Regional Water Management Plan Update	.271,800
Develop Interim Water Policies per Regional Plan Settlement Agreement	.100,000

Water Supply

Pilot Aquifer Storage & Recovery Project in South Truckee Meadows	.183,800
S. Washoe County Groundwater Recharge Site Analysis	.134,000
Stream & Precipitation Gauges Including Flood Warning System	.173,600
Investigate Groundwater Flow Between Hydrographic Basins in N. Valleys	.44,200
Truckee River Operating Agreement Planning & Implementation	.40,000
Analysis of Truckee River Water Rights Availability	.53,000
Analysis & Recommendation for Emergency Water Supply Alternatives	.60,000
Orr Ditch Recharge Analysis & Groundwater Modeling	.64,600
N. Valley Water Supply Comparison	.79,500
Development of Well Mitigation Options	.17,700
Groundwater Resource Evaluation of Dry Valley	.264,700
Groundwater Resources Data Center & Well Mitigation Program	.107,000
Ground Deformation Study using Satellite Based Radar	.9,000
Evaluation of Regional Precipitation Estimates using PRISM	.10,000
Water Supply Alternatives Evaluation for N. Valleys	.107,000

Flood Control and Stormwater Drainage

Hydrological Analysis for Evans Creek/Block N Flood Control Project	.49,000
Facility Plan for Desert Springs/Reach 9 Flood Control Project	.100,000
Regional Flood Management Plan & Design Manual Update	.250,000
Floodplain Management Plan Development	.10,000
Flood Storage Volume Mitigation Program	.103,100

Water Conservation

Base Case Water Conservation Program	.154,500
Evapo-Transpiration Irrigation Controller Studies	.80,800
Ultra Low Flow Toilet Retrofit Program	.2,300,000
Commercial & Residential Water Audit Program	.162,400
Landscape Irrigation Auditor Class	.30,000



WASHOE WATER

REGIONAL WATER MANAGEMENT FUND PROJECTS

Major Water Plans and Projects for Today and the Future

Regional Water Management Plan Update

After completing the required five-year review of the Regional Water Management Plan (RWMP) in February 2002, the RWPC and staff began the update process. The huge task of compiling information to update the plan's numerous tables, charts and maps was delegated to staff members of various RWPC member entities and a team of consultants.

Seven months after starting the update process, the RWPC received a request from Reno, Sparks and Washoe County to develop interim water policies and criteria. The request came as a result of the Regional Plan Settlement Agreement. The policies were applicable in areas where City-County cooperative planning would take place for the interim until the adoption of the RWMP update. The interim water policies, with a few changes and additions, are incorporated into the RWMP's first chapter: Regional Water Planning Policies and Criteria.

Also integrated into the 11-chapter updated plan are the results of more than 40 studies and plans completed since the original Regional Water Management Plan was adopted in 1997. An updated plan was presented in draft form in March 2004. During its review of the draft plan, the RWPC dealt with tough issues such as 20-year population growth forecasting, projections for water demands and wastewater flows, drought planning, water conservation, water pollution control, and flood control including possible effects on development. To view the plan, please visit www.washoecounty.us/water and follow the link to the Washoe County Comprehensive Regional Water Management Plan.



The Truckee River is a major source of water for Washoe County.

Toilet Retrofit Program

Research conducted by the RWPC has indicated that, second to water meters, the replacement of older toilets is one of the most effective ways to cut residential water waste.

Toilets manufactured before the mid-1990s use 3.5 gallons or more per flush, while newer models, ultra low-flush toilets, use only 1.6 gallons. Since the Truckee Meadows Water Authority is installing water meters throughout its service area, the RWPC in 2001, decided to initiate a regional toilet retrofit program. The program is a collaborative effort among Sun Valley General Improvement District (SVGID), Truckee Meadows Water Authority (TMWA), Reno, Sparks and Washoe County. It is financed by the Regional Water Management Fund, SVGID toilet retrofit funds and Truckee Meadows Water Reclamation Facility water conservation funds.

In the four years the RWPC has been replacing toilets, it has offered rebates to residential property owners, or free toilets including installation. Currently managed by SVGID, the program has replaced more than 15,000 water-wasting toilets, conserving an estimated 420 acre-feet (nearly 137 million gallons) of water annually.

As many as 114,000 Truckee Meadows homes are estimated to have been built with older, water wasting toilets. If each of these homes converted to ultra low-flush toilets, the estimated annual water savings would amount to more than 5,000 acre-feet, or more than 1.6 billion gallons. That's water that can be stored as drought reserves or used to improve flows in the Truckee River. These estimates compelled the RWPC to initiate a pilot program targeting the replacement of 10,000 older toilets. As of December 2004, the original goals of the program have been exceeded and nearly all of the funding has been used, leaving the RWPC to seek state and federal grants if the program's full potential is to be realized.



Water-wasting toilets are being replaced throughout the region.

TOILETS REPLACED	
Reno	7,115
Sparks	3,737
Washoe County	4,245
Total	15,097*

* Replacement of these toilets yields an annual savings of 420 acre-feet (137 million gallons) of water.



New Water Sources Required for Build-Out

Analysis of Available Truckee River Water Rights and Projections of Future Demand

In the 1997 Regional Water Plan, the RWPC identified the need to evaluate Truckee River water rights in the Truckee Meadows that potentially could be converted from either inactive status or other uses, such as agriculture, to provide municipal/industrial water to the growing community.

In 2000, the RWPC initiated an important study that reviewed the current status of each water right claim in the Orr Ditch Decree. In 1944, the Orr Ditch Decree set forth water right ownership, amount and use for nearly all water from the Truckee River and its tributaries in Nevada. The analysis then assessed the availability of those water rights and estimated the potential for purchase and conversion to municipal/industrial

use by water right category. Future Truckee River water demands were projected based on an assessment of the build-out (full development) potential of existing land use designations (zoning) for vacant land and assumed development potential for large parcels.

The study concluded there are adequate Truckee River and tributary water rights to supply the projected build-out demand for most of the region's planning areas that are assumed to be served with Truckee River water. However, to provide water for the entire build-out demand, a new source of water would be necessary. The RWPC has followed up this significant finding with a detailed inventory of water resources for the region. It includes refined water demand projections based on both population growth forecasts and potential build-out of existing land use designations.



Truckee River at Verdi.



Seepage through streambeds and irrigation ditches is a common source of groundwater recharge.

Southern Washoe County Groundwater Recharge Analysis

The process of precipitation seeping into the ground and replenishing groundwater aquifers is called groundwater recharge. Natural recharge is the infiltration of surface water through streambeds, alluvial fans or other pervious land surfaces. Incidental recharge occurs as a secondary result of water uses such as irrigation, and by seepage from irrigation ditches, reservoirs and other structures designed to convey, store or dispose of water and wastewater.

Urban development tends to decrease both natural and incidental recharge. Increased urbanization and high-density rural development lead to increased hard, impermeable surfaces, such as streets, rooftops and driveways, and decreased natural groundwater recharge areas. Additionally, as irrigated agricultural lands are developed, incidental recharge from irrigation ditches and fields is diminished.

The RWPC determined the loss of groundwater recharge is a problem and included a policy statement in the Regional Water Management Plan that calls for natural groundwater recharge areas to be defined and protected. A 2001 study evaluated the potential for groundwater recharge in southern Washoe County using hydrology, geology, soils, water delivery infrastructure and site suitability. An important result of the study is a recharge area map that has been provided to land use planners for use in reviewing development plans.



WASHOE WATER

REGIONAL WATER MANAGEMENT FUND PROJECTS

South Truckee Meadows Facility Plan

The South Truckee Meadows Facility Plan, completed in July 2002, is the long-range water resource plan to support the build-out of approved land uses within the portion of the South Truckee Meadows that receives water service from either the Washoe County Department of Water Resources (WCDWR) or from the South Truckee Meadows General Improvement District (STMGID).

Available water resources in this area include groundwater, Truckee River water, tributary creek water from Galena, Whites and Thomas creeks. For irrigation, wastewater effluent from the South Truckee Meadows Water Reclamation Facility is available. Truckee

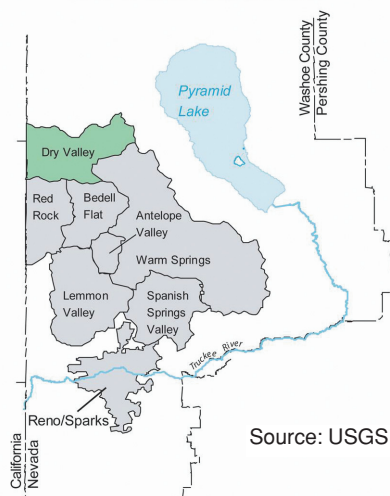
River water is supplied to the Double Diamond/Damonte Ranch area under a wholesale contract between WCDWR and the Truckee Meadows Water Authority.

The tributary creek water rights will be converted from agricultural to municipal use for the first time in this area, necessitating the construction of one or more surface water treatment plants, currently under design.

The facility plan provides a road map for the long-term sustainable use of the water resources in this area in a way that 1) considers groundwater levels on the Mount Rose fan; 2) promotes the use of wastewater effluent to reduce potable water demands; and 3) provides a reliable water supply through the 10-year hypothetical drought cycle.



DRY VALLEY LOCATION



Source: USGS

More Water Resource Developments

Dry Valley Groundwater Resource Investigation

Dry Valley, which lies just north of Red Rock Valley, is a possible new source of water supply for the Stead/Lemmon Valley area.

Uncertainty about the yearly amount of groundwater that might be available from Dry Valley's aquifer compelled the RWPC to request the U.S. Geological Survey (USGS) to study the basin and report its findings.

The USGS was asked to estimate the annual amount of groundwater that passes through the basin and to characterize the water quality. The USGS used field mapping, subsurface boring and satellite imagery to evaluate plant cover, geology and hydrogeology.

The final report indicates an estimated 700 to 1,000 acre-feet of groundwater flows through Dry Valley annually, and that the water quality is good. For more information on this report, e-mail GS-WVpublic-info@usgs.gov.

Spanish Springs Valley Groundwater Budget Analysis

With continued growth in Spanish Springs Valley, long-term water demands could exceed the available groundwater supply. This study, prepared with the support of the groundwater modeling staff of the Washoe County Department of Water Resources, updates a U.S. Geological Survey groundwater model to year 2000 conditions. The study also projects groundwater levels at build-out of the approved land uses to arrive at recommendations to balance the groundwater budget in the Spanish Springs area. It considers all available water resources to support approved land uses, including wholesale water supplied by the Truckee Meadows Water Authority and wastewater effluent that could be reused for non-potable demands.



The Hilton pond is recommended as one of several short term emergency supplies.

Emergency Water Supply Alternatives

A Regional Water Planning Policy, "Emergency Water Supply Standard," directs water utilities using Truckee River water to plan for continued water service in the event of a one- to seven-day contamination event on the Truckee River.

In 2002 the RWPC, Truckee Meadows Water Authority, Washoe County Department of Water Resources and Washoe County District Health Department participated in the development of the study "Recommended Projects to Provide an Emergency Water Supply to the Truckee Meadows" that identified projects and management strategies that could be implemented to satisfy the requirements of the policy and ensure a safe emergency water supply.



WASHOE WATER

REGIONAL WATER MANAGEMENT FUND PROJECTS

Water Resources and Groundwater Issues

North Valleys Water Supply

The RWPC has completed a number of studies that 1) identify the potential water demands and wastewater flows associated with the full build-out of the approved land uses in the North Valleys area, 2) identify the major water, wastewater, and effluent reuse infrastructure that would be required to serve this development, 3) evaluate options to extend available water resources through the integrated operation of Truckee Meadows Water Authority and Washoe County Department of Water Resources facilities, and 4) compare the costs and opportunities associated with two options for additional water resources in the area: importation of additional Truckee River water versus the importation of a new water supply from the north.

A combined Vidler Water Company/ Intermountain Pipeline importation project consisting of groundwater from Fish Springs Ranch, Dry Valley, Newcomb Lake, Bedell Flat and Warm Springs was studied. A common pipeline route currently is in environmental review.

The flood control effects of the full build-out condition with additional water importation will be evaluated in 2005. The RWPC has recommended that, after flood control effects are evaluated and additional wastewater disposal alternatives are studied, all the study results be integrated into a single plan.

Groundwater Resources Data Center

In November 2001, the Board of County Commissioners (BCC) directed the Regional Water Planning Commission (RWPC) to form a task force to study groundwater development and domestic well issues and to make policy recommendations. The ground water task force was created in response to concerns expressed by a small number of domestic well owners about groundwater level declines and the effect on private domestic wells. These well owners, some of whose wells have gone dry, believe if municipal well pumping has caused the water table to drop to the extent that a domestic well goes dry, the owner's loss of water supply should be mitigated. If a home with a dry well is too far from a municipal water system to connect, the well must be deepened or a new well must be drilled.

The task force, recognizing the complexity of



Domestic wells serve residents in outlying areas.

the issues, met twice monthly for more than a year to gather information, define the problem, make findings and offer recommendations. A final report presents recommendations regarding the formation of a Data Center and a Well Mitigation Program. The RWPC and the BCC approved the recommendations in 2003.

The Washoe County Groundwater Resources Data Center, now in its first year, compiles and distributes information about groundwater

resources and provides information used to evaluate domestic well mitigation requests. The Washoe County Well Mitigation Hearing Board, a volunteer board made up of water well and hydrogeology experts, evaluates requests for mitigation. The board determines responsibility and makes a recommendation to the appropriate municipal water purveyor. Water purveyors voluntarily work out mitigation measures and costs with the domestic well owner.



WASHOE WATER

REGIONAL WATER MANAGEMENT FUND PROJECTS

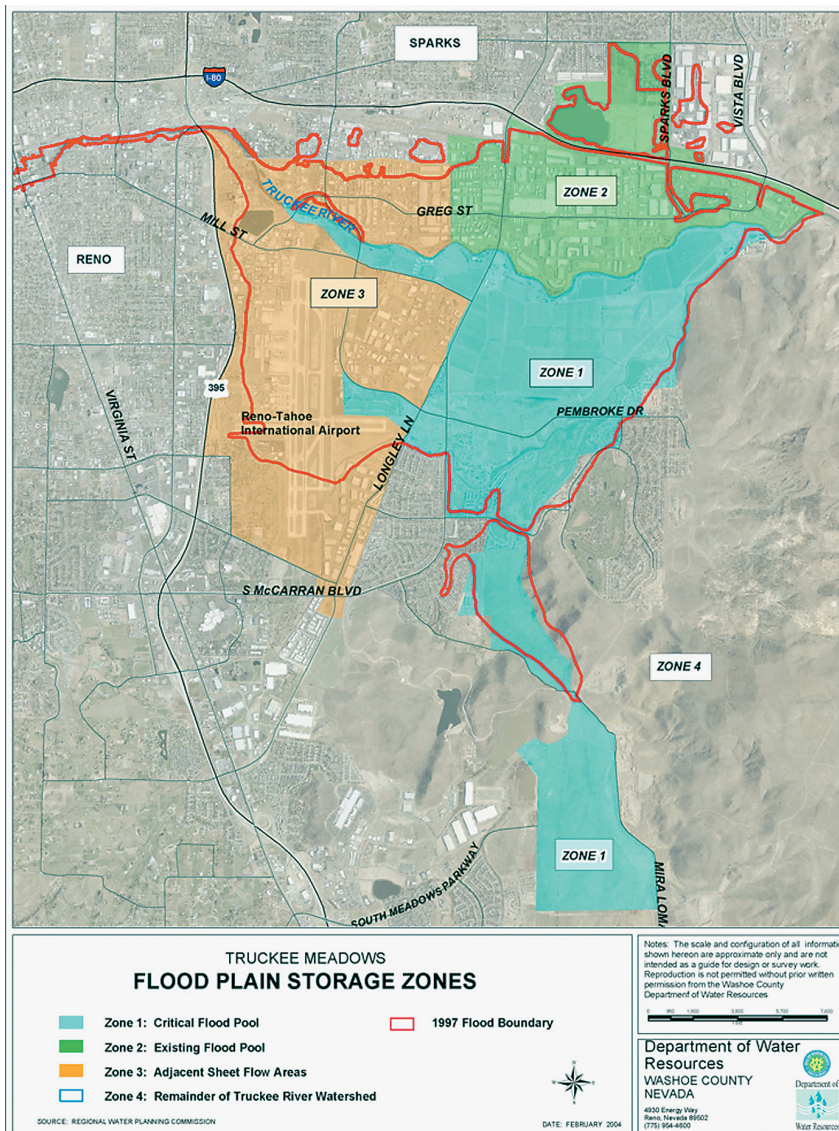
Flood Control and Storm Water Drainage

Floodplain Management Strategy

The Floodplain Management Strategy, which is an ongoing effort by the RWPC, identifies the various types of flood hazards in Reno, Sparks and the unincorporated areas of southern Washoe County. It also identifies strategies to reduce the potential damages associated with flood events while also potentially reducing flood insurance premiums for property owners within the area. Ongoing work includes the identification of strategies to reduce damages that could result from increased flows and loss of flood storage volume due to approved, but unbuilt future development.



An aerial view of 1997 flooding in Sparks.



Flood Plain Storage Volume Mitigation Program

The ability to store floodwater on the flood plain is critical for the success of the proposed Truckee River Flood Management Project, a \$260 million plan to reduce flood damages. The future protection offered by the project could be compromised if flood plain storage is lost. Additionally, many properties that were built according to federal standards for the National Flood Insurance Program may be at risk because of the loss of flood plain storage.

In 2003, the RWPC initiated the Flood Plain Storage Volume Mitigation Program to ensure the Truckee River Flood Management Project remains feasible and to minimize flood impacts in the future. Currently, a flood-engineering consultant is working cooperatively with city and county flood management officials to develop a program to mitigate losses in flood plain storage volume and to address the amount and timing of runoff from the surrounding watershed.

The flood plain and surrounding watershed are divided into four zones.

In Zone 1, flood storage must be mitigated on a one-for-one basis; for each cubic yard of fill material placed or available flood storage displaced, one cubic yard of new flood storage must be developed in that zone.

In Zone 2, storage loss also will have to be mitigated on a one-for-one basis to protect existing property improvements until the flood project is built.

Mitigation for properties in Zones 3 and 4 can be accomplished by simply re-examining the local government's policies on detention to assure the peak flows reaching the Truckee River are not impacting the flow at Vista.



WASHOE WATER

REGIONAL WATER MANAGEMENT FUND PROJECTS

Water Conservation Maximizes Resources

Evapotranspiration (ET) Satellite Irrigation Controller Study

In 2002, the Washoe County Regional Water Planning Commission and the Truckee Meadows Water Authority (TMWA) collaborated with University of Nevada Cooperative Extension, the University of Nevada (UNR) and the Desert Research Institute to investigate the effectiveness of a new landscape irrigation controller. The new controller uses daily evapotranspiration (ET) data transferred by satellite from three local weather stations. Irrigation using ET rates is a method that precisely applies the amount of water necessary to replace moisture that is lost from soil and plants.

The study compared the amount of water used by four methods at residential and commercial sites: intuitive irrigation, irrigation using ET data programmed manually by a UNR-trained technician, ET scheduled irrigation with data programmed manually by a trained professional, and ET satellite-controlled irrigation. Study results show in most cases the satellite controller applied 30 percent less water on average than the intuitive irrigation method. Trained professionals, however, slightly outperformed the the satellite controller, while the technician group applied almost the same amount of water.

The Regional Water Planning Commission will participate in a second study in 2005 to compare two different types of ET irrigation controllers. To learn more about ET irrigation, visit www.washoet.dri.edu.



A catch can test is performed as part of a water audit.



Bill Carlos of University of Nevada Cooperative Extension measures plant stress during irrigation controller study.

Irrigation Management Training Classes

Local green industry professionals attended a three-day irrigation management training class sponsored by the RWPC in partnership with TMWA in Spring 2003. Participants learned the latest water management principles, irrigation auditing, and techniques to reduce water waste and encourage healthy landscapes. This class

also kick-started the successful 2003 Residential Water Audit Program.

The RWPC and TMWA once again will co-sponsor the irrigation audit training class in March 2005, encouraging participants to take a certification exam to become certified landscape technicians. The 2005 water audit program will be expanded to serve the commercial industry in addition to local residents.



WASHOE WATER

REGIONAL WATER MANAGEMENT FUND PROJECTS

Water Quality and Wastewater



Truckee River restoration efforts are ongoing at The Nature Conservancy's McCarran Ranch.

Lower Truckee River Restoration

The lower Truckee River — from the Truckee Meadows to Pyramid Lake — is a vital natural resource. An environmentally restored river improves water quality and the river's ability to withstand flood flows. Restoration also improves plant communities and habitat for fish and wildlife while preserving open space and enhancing recreation activities such as fishing and canoeing. The RWPC includes restoring the lower Truckee River among its top priorities because, simply speaking, a sustainable river is an investment in the region's quality of life.

The McCarran Ranch pilot restoration project, successfully completed by the Nature Conservancy in November 2003, restored approximately one mile of river by re-contouring the channel, creating four riffle-pools and two wetlands, and re-vegetating approximately seven acres of floodplain. This is the first step in restoring the five miles of river at the McCarran Ranch.

North Valleys Wastewater Disposal Analysis

Ongoing work being performed by the RWPC includes the evaluation of alternatives for the disposal of wastewater effluent in the North Valleys.

Effluent disposal in this area historically has been via discharge to lagoons and the Swan Lake playa. If new water resources are imported to the area from either the Truckee River or through a northern importation project, there could be a

significant increase in development, necessitating the implementation of expanded strategies for the management of wastewater effluent.

This study will evaluate the feasibility of various alternatives in this hydrologically closed basin with no surface water outflow.

Truckee River Tributary Watershed Assessment

During 2001, the RWPC initiated a cooperative effort with the Washoe County Department of Water Resources, University of Nevada Cooperative Extension and Washoe-Storey Conservation District to assess the health of Truckee River tributary streams, and then develop a management plan aimed at preserving or improving water quality throughout the watershed.

Water quality problems sometimes can be traced upstream to poor creek conditions. The assessment report "Watershed Assessment for Tributaries to the Truckee River" provides the community a report card on the condition of urban tributary creeks in terms of the geology, soils, slope, wetlands, areas prone to flooding, vegetative cover, and land use, potential sources of pollution and water quality.

A follow-up report, "Watershed Management and Protection for Tributaries to the Truckee River," states effective watershed protection and management will require the assistance of local jurisdictions, agencies and the community as a whole. Much of the work can be accomplished

through educational efforts, changes in development practices and integrating this plan with storm water management.

Truckee Meadows Regional Storm Water Quality Management Program

Since the 1980s, studies conducted by the federal Environmental Protection Agency and others have shown storm water runoff from urbanized areas is a leading cause of water quality impairment to the nation's water bodies. Changes made to the Clean Water Act in 1987 resulted in regulations that now require municipalities to control non-point source pollution in urban runoff that flows through their storm drains.

The Nevada Division of Environmental Protection issued the first Municipal Storm Water Discharge Permit jointly to the Cities of Reno and Sparks, Washoe County and the Nevada Department of Transportation in 1990. With the City of Reno in the lead, the permittees formed the Truckee Meadows Storm Water Permit Coordinating Committee with the purpose of implementing the permit requirements.



A vegetated swale is an example of a storm water structural control feature.

The RWPC has supported Reno, Sparks and Washoe County efforts to fulfill the permit requirements by cost sharing the development of the:

- Truckee Meadows Regional Storm Water Quality Management Program
- Construction Site Discharge Program and Best Management Practices Handbook
- Structural Controls Program and Design Manual
- Professional Advisory Group



WASHOE WATER

REGIONAL WATER PLANNING COMMISSION

Washoe County Regional Water Planning Commission Meetings

The RWPC meets twice a month on the first and third Wednesdays. These public meetings are held at 1:30 p.m. in the Washoe County Commission Chambers on the first floor of Building A, 1001 E. Ninth St. (at Wells Avenue) in Reno.

Meetings are televised on WCTV-17. Check the programming guide at www.sncat.org for up to date broadcast times.

RWPC agendas and minutes can be viewed by visiting the Washoe County Department of Water Resources Web site, www.washoecounty.us/water, and clicking on the Regional Water Planning Commission link. Copies also can be obtained by calling the Department of Water Resources at 954-4665.

The RWPC Jurisdiction and Agenda Committee meets the first and third Wednesdays of the month at 9 a.m. in the Washoe County Department of Water Resources main conference room, 4930 Energy Way, Reno.

The RWPC Advisory Committee on Water Conservation meets at 8:30 a.m. on Thursdays following RWPC meeting days, also at the Washoe County Department of Water Resources.

Information about the Washoe County Groundwater Resources Data Center and Well Mitigation Program can be obtained by calling 954-4650 or visiting the Department of Water Resources Web site.

Information about evapotranspiration rates and lawn irrigation “run-times” is available at www.washoet.dri.edu.

WCTV-17 Broadcast Schedule for RWPC Meetings

Program	Live	1st Replay	2nd Replay
Water Planning Commission	1st & 3rd Wednesday 1:30 p.m.	Following Thursday 2:00 p.m.	Following Sunday 8:00 p.m.

