Chapter 10

Integrated Planning / Financial Summary

List of Tables

Purpose and Scope

NRS 540A.140 discusses the required elements of the Regional Water Plan (referred to as Comprehensive Regional Plan in the statute). Item 7 describes the required cost/financing element of the Regional Water Plan as follows:

> *"7. Cost and financing, which must include an estimate of the cost of each major facility, source of water or other requirement of the plan and an analysis of alternatives for financing and funding the facility, source or other requirement, or alternatives thereto, as well as the effect of the funding alternatives on other facilities included in the plan. The estimate of cost must state the financial impact on persons within the region, including, without limitation, all direct and indirect costs of connecting to the system, if any."*

The primary purpose of this chapter is to respond to this requirement of NRS 540A.140.7. Section 10.1 of this chapter provides an overview of the statute and how this chapter is or is not able to respond to it.

Section 10.2 provides a discussion of the linkages between water resources. Section 10.3 summarizes the major work that will be undertaken by various entities in each of the resource management areas: water, wastewater, storm water, and flood control. Section 10.4 provides a summary of the costs contained in the Capital Improvement Programs (CIPs) of each of the major water purveyors, wastewater treatment providers, and local governments in the Planning Area.

10.1 Regional Water Plan Cost and Financing Analysis

Following is a breakdown of the cost and financing analysis referred to in NRS 540A.140.7, and a discussion of how the Regional Water Plan addresses it.

a) "Cost of each major facility":

   Facilities are designed and constructed by water purveyors, wastewater treatment providers, and local governments as part of their respective CIPs. CIPs are updated annually, at a minimum, and reviewed by the RWPC pursuant to NRS 540A, Policy 4.1.a, and RWPC administrative policies and procedures. Summaries of the pertinent facilities within CIPs used to compile tables in Section 10.4.3 are set forth in Appendix I. Items in Appendix I are planned facilities and may be subject to future conformance review.

b) "Source of water or other requirement of the plan and an analysis of alternatives for financing and funding the facility, source or other requirement, or alternatives thereto, as well as the effect of the funding alternatives on other facilities included in the plan":

   This analysis is part of the effort that is undertaken by the RWPC, local governments, wastewater treatment providers, or water purveyors when they update their facility and resource plans. These plans are then presented to the RWPC for either conformance review or informational purposes, as appropriate under the NRS 540A, Policy 4.1.a, and RWPC administrative policies and procedures. Such plans are referenced throughout this plan.

c) "Estimate of cost must state the financial impact on persons within the region, including, without limitation, all direct and indirect costs of connecting to the system, if any":

Cost of connection is a matter beyond the purview of the RWPC and would be extremely complex to describe on a regional basis due to the different methodologies used by utilities and local governments to arrive at their respective rates and connection fees. Some of the difficulties in performing this analysis include: combined sewer and storm water utilities, federal and grant funding of facilities, Public Utility Commission setting of rates and fees for private utilities, developer construction and dedication of major infrastructure, and 1 to 5 year window of time for Capital Improvement Programs vs. 20-year projections in the Regional Water Plan. Such limitations on data, and the complexity of data that is available, make it almost impossible to develop a comprehensive analysis that is meaningful. Section 10.3 of this chapter summarizes the costs contained in the CIPs of water purveyors, wastewater treatment providers, and local governments for water resource related items. Based on CIPs reviewed in this plan, the combined, estimated costs for wastewater, flood control/storm water, and water facilities over the next 5 years is over $683 million (see Table 10-6).

10.2 Linkages Between Water Management Areas

Linkages are defined as being those aspects of the solution to one system, such as water, wastewater or flood control improvements, that affect the needs and costs of one or more other systems. A "linkage" exists when an action taken in response to one water management area affects the costs and needs of another management area. For example, a wastewater effluent reuse project may reduce projected potable water demands and the resulting cost of delivering water. However, the potential need for water rights to implement the reuse project may place undesirable demands on the area's total available water rights needed for other beneficial water management programs.

Specific issues and linkages for twenty-three regional water management issues are described in Chapter 9. Reviewing the common themes between these water issues, fourteen different water management areas were identified that affect one another. These water management areas are not all-inclusive, but they capture the key issues that should be considered when taking action to implement a specific solution. A concise summary of the primary linkages between each of the water management areas is described in Table 10-1, with further detail and discussions following.

Table 10-1
Integrated Water Planning
Summary of Linkages

Water Management Areas	Linkage	Description of Affects
Sustainable River	Water Conservation	Water quality is improved when conserved water remains in the river
	Effluent Reuse	Benefits from reuse should be compared to non-structural improvements
	Efficient Use of Water Rights	Required to implement water supply and water quality programs
	Wastewater Treatment & Disposal	Potential benefits from non-structural water quality improvement projects
	Watershed Management	Reduction in non-point source pollution improves water quality
	Storm Water Management	Less erosion and pollutant loading benefits water quality
	Land Use Planning	Land uses must be consistent with regional water management programs
	Flood Plain Management	Truckee River Flood Management Program uses river restoration
Efficient Use of Water Rights	Effluent Reuse	Reuse places a competing demand on limited Truckee River water rights
	Water Supply	Supplies depend upon efficient use of water rights
	Wastewater Treatment & Disposal	Additional treatment required to implement reuse
	Domestic Wells	Use from domestic wells must be accounted for
	Sustainable River	Water quality needs may place additional demands on limited water rights
	Land Use Planning	Development potential may be limited by inefficient use of water rights
Water Supply	Effluent Reuse	Reuse provides an alternate source of supply for non-potable uses
	Water Conservation	Extends water supply capability and drought reserves
	Drought Storage	Provides a reliable water supply
	Efficient Use of Water Rights	Efficient use extends water supply availability
	Water Treatment	Treatment required for poor quality groundwater
	Domestic Wells	Usage must be accounted for together with M&I usage
	Groundwater Recharge	Supplements available water supplies and drought storage
	Land Use Planning	Development of land uses is constrained by water availability
	Wastewater Treatment & Disposal	Wastewater disposal capacity must be consistent with water supply
Water Treatment	Water Conservation	Conservation reduces demand and defers capacity additions
	Effluent Reuse	Provides an alternate source of supply for non-potable uses
	Watershed Management	Watershed management improves river water quality
	Water Supply	New supplies require treatment for poor quality groundwater and creeks
	Land Use Planning	Changes in land use may affect size, location and timing of facilities
Water Conservation	Drought Storage	Extends water supply capability and drought reserves
	Water Supply	Available water supplies control the level of conservation required
	Sustainable River	Water quality is improved when conserved water remains in the river

Table 10-1
Integrated Water Planning
Summary of Linkages - Continued

Water Management Areas	Linkage	Description of Affects
Drought Storage	Water Conservation	Extends water supply capability and drought reserves
	Land Use Planning	Development must be consistent with water supply availability
	Efficient Use of Water Rights	Efficient use extends water supply availability
	Groundwater Recharge	Supplements available water supplies and drought reserves
	Wastewater Treatment & Disposal	Stored water may be released during low flows, benefiting water quality
Groundwater Recharge	Water Supply	Non-irrigation season river water is used to replenish groundwater basins
	Domestic Wells	Domestic wells benefit from supplemental recharge
	Wastewater Treatment & Disposal	Highly treated effluent may help replenish groundwater basins
	Watershed Management	Reduced non-point source pollution may improve groundwater quality
	Storm Water Management	Infiltration of runoff may help replenish groundwater basins
	Land Use Planning	Land uses may be regulated to maintain or enhance natural recharge
Domestic Wells	Efficient Use of Water Rights	Efficient use of water rights may impact groundwater levels
	Water Supply	M&I water supplies must account for domestic well usage
	Groundwater Recharge	Groundwater recharge programs may also benefit domestic wells
	Watershed Management	Reduced non-point source pollution may improve groundwater quality
	Wastewater Treatment & Disposal	Highly treated effluent may help replenish groundwater basins
	Storm Water Management	Infiltration of runoff may help replenish groundwater basins
	Land Use Planning	Planned land uses must consider needs of domestics well owners
Wastewater Treatment & Disposal	Water Conservation	Conservation reduces wastewater flow and defers capacity additions
	Efficient Use of Water Rights	Inefficient use of water rights if wastewater does not return to River
	Water Supply	Water supply must be consistent with wastewater disposal capacity
	Groundwater Recharge	Groundwater basins may be replenished with highly treated effluent
	Sustainable River	Water quality and health of River is influenced by nutrient loading
	Watershed Management	Reduced non-point source pollution may benefit TMWRF
	Flood Plain Management	River restoration may benefit TMWRF discharge requirements
	Land Use Planning	Development of planned land uses is constrained by disposal capacity
Effluent Reuse	Efficient Use of Water Rights	Efficient use is required to implement reuse and other programs
	Drought Storage	Drought storage may benefit with reclaimed water for non-potable uses
	Water Supply	Potable water supplies may be extended by implementation of reuse
	Water Treatment	Water treatment capacity is not required to meet reuse demands
	Wastewater Treatment & Disposal	Effluent reuse is one of several wastewater disposal options available
	Sustainable River	Benefits from non-structural improvements should be compared to reuse

Table 10-1
Integrated Water Planning
Summary of Linkages - Continued

Water Management Areas	Linkage	Description of Affects
Watershed Management	Water Treatment	Fewer treatment improvements may be required with healthy watershed
	Wastewater Treatment & Disposal	Fewer treatment improvements may be required with healthy watershed
	Groundwater Recharge	Enhancing recharge is a key element of watershed management
	Storm Water Management	Less erosion and pollutant loading benefits water quality
	Land Use Planning	Low Impact Development may help watershed management objectives
Flood Plain Management	Wastewater Treatment & Disposal	Non-structural opportunities may benefit flood control programs
	Sustainable River	River restoration is integral to Truckee River Flood Management Project
	Storm Water Management	On-site retention to manage runoff so no loss of flood storage volume
	Land Use Planning	Development must be consistent with flood plain management programs
Storm Water Management	Watershed Management	Water quality benefits from reduced erosion and pollutant loading
	Groundwater Recharge	Groundwater basins may be replenished by infiltration of storm water
	Land Use Planning	Development must be consistent with storm water management programs
Land Use Planning	Effluent Reuse	Reuse may extend potable water supplies and development potential
	Drought Storage	Provides a reliable water supply to meet current and future uses
	Water Treatment	Capacity additions are needed to meet projected increase in demands
	Water Supply	Additional supplies are needed to meet projected increase in demands
	Efficient Use of Water Rights	Efficient use is necessary to meet demands and regional water programs
	Wastewater Treatment & Disposal	Capacity additions are needed to meet projected increase in demands
	Groundwater Recharge	Natural recharge areas should be maintained or enhanced
	Domestic Wells	Existing and potential usage should be reflected in water supply needs
	Watershed Management	Management objectives should evaluate Low Impact Development
	Flood Plain Management	Management programs must be consistent with planned land uses
	Storm Water Management	Management programs must be consistent with planned land uses
	Sustainable River	Regional water management programs must be consistent with land uses

10.2.1 Efficient 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. The primary uses for Truckee River and tributary water rights are presented in Section 6.6, and include:

- Water rights for maintenance of in-stream flows in the lower Truckee River
- Water rights for water quality enhancement in the lower Truckee River
- Dedication of water rights for M&I supplies
- Dedication of water rights as return flow credit water

To satisfy each of these demands independently may eventually require more water rights than can be provided by the river and its tributaries. The many demands need to be coordinated to the extent possible through cooperative management of the water resources. Local entities should strive to satisfy two or more of the water management areas with the same water rights.

10.2.2 Water Supply

Practically all of the water management areas affect the region's water supply, particularly drought storage, water conservation and the efficient use of water rights. Other less obvious issues affect water supply, such as groundwater recharge and domestic wells. Groundwater levels are expected to diminish regionally over time due to development in natural recharge areas and the loss of secondary recharge sources such as agricultural irrigation and ditch leakage. Opportunities exist; however, to enhance recharge and help mitigate this trend.

Future groundwater development will need to optimize production in order to meet projected demands. This will very likely involve limited production of poor-quality groundwater that will require treatment for constituents such as PCE, arsenic, iron and manganese. The construction of surface water treatment plants in the South Truckee Meadows is an integral part of developing future water supplies. Future demands that will result from development of planned land uses can be met most effectively by optimizing the use of available water resources, including surface water, groundwater, reclaimed water and imported water where it makes sense.

10.2.3 Water Treatment

Numerous water management areas affect the need for water treatment improvements. Conservation, reuse and watershed management programs may defer capacity improvements or reduce specific treatment requirements. Alternatively, land use decisions will affect the capacity, location and timing of treatment improvements. As new supplies are developed to meet increasing demands, water treatment for the tributary creeks will be provided, as well as treatment for poor quality groundwater.

10.2.4 Water Conservation

Some of the primary benefits associated with water conservation include:

- Preservation of reserve water resources during dry years

- Reduced capital investments required for water production and wastewater treatment and disposal facilities
- Delayed development of additional water supplies
- Conserved water may remain in the river, improving water quality

One area of concern with conservation relates to the TDS concentration of TMWRF effluent. The concentration may exceed the currently permitted limits since the TDS mass load to the plant would not decrease in proportion to the flow reductions that would result from conservation. Potential additional costs for compliance with TMWRF effluent TDS limitations may be required.

10.2.5 Drought Storage

Efficient use of water rights and water conservation helps to extend the water supply during droughts. Groundwater recharge is another program that supplements natural recharge in the Truckee Meadows and Lemmon Valley hydrographic basins. Development potential and the yield from TMWA's combination of water resources are directly related to the drought storage and the drought planning period. It is also noteworthy that upstream reservoir storage is used to release water during low flow periods in the river to improve water quality.

10.2.6 Groundwater Recharge

Water supply and domestic wells are obvious water management areas that benefit from groundwater recharge. Watershed management, stormwater management and land use programs also can positively affect recharge, both water quantity and quality.

Wastewater disposal practices such as rapid infiltration basins and indirect potable reuse may provide benefits to groundwater basins where water levels have declined, such as Lemmon Valley and Spanish Springs. Indirect potable reuse of effluent involves a higher level of wastewater treatment, essentially to drinking water standards, using processes such as micro-filtration, reverse osmosis and ultraviolet disinfection prior to disposal into recharge facilities. This practice is gaining favor with municipalities throughout the arid west, such as Orange County, California and Maricopa County, Arizona. Public education programs are an important element of any groundwater recharge program utilizing treated effluent.

10.2.7 Domestic Wells

Domestic wells are affected by a number of water management areas, particularly land use planning and water supply. Only in the last few years have the demands of existing and potential domestic wells been incorporated into regional planning efforts such as the South Truckee Meadows Facility Plan (ECO:LOGIC, 2002) and the Water Resource Baseline. Opportunities exist to enhance recharge and help mitigate groundwater level declines, through coordinated water supply planning, watershed and stormwater programs, and managed wastewater disposal practices.

10.2.8 Wastewater Treatment and Disposal

Wastewater treatment and disposal is arguably the most complex water management area. Wastewater disposal in particular has implications from efficient use of water rights and water supply, to flood plain management and a sustainable river.

For example, any new potable water source brought into the Stead or Lemmon Valley area that increases wastewater flow to the RSWRF above 2.0 MGD will necessitate the implementation of additional effluent management techniques, such as exportation from the hydrographic basin or effluent reuse. Effluent treatment and disposal options should also consider implications regarding total cost, the efficient use of the total available water resources within this hydrographic basin.

As described in Chapter 5, the Army Corps of Engineers (Corps) and Washoe County have proposed a flood control alternative that would increase the rate of Truckee River floodwaters downstream of the Truckee Meadows. In order to mitigate these floodwaters, the Corps is interested in river restoration efforts on the lower Truckee River. Coincident with the Corps restoration efforts, the Lower Truckee River Restoration Advisory Committee (advisory committee to the RWPC) has organized the Cities of Reno and Sparks, Washoe County, the Tribe, the BLM and to some extent, Storey County to agree to a Memorandum of Understanding (MOU) on restoring the lower Truckee River. The MOU is a statement of public benefits, goals, and management principles that represent a common understanding and foundation.

One of the significant linkages and public benefits from river restoration is water quality, and tied to it, the wastewater treatment capacity of the region. The development of a better understanding of the assimilative capacity of the Truckee River for nutrients is essential to the protection of fisheries and aquatic life. Currently, the Cities of Reno, Sparks and Washoe County are conducting on-going sampling and testing of key water quality parameters through the Regional Coordinated Monitoring Program. In addition, on-going studies and watershed / water quality modeling are underway to better understand the fate and transport of nutrients in the river and ultimately, Pyramid Lake. It is anticipated that the result of this improved understanding will be incorporated into revised TMDLs and associated WLAs for nitrogen and phosphorus. Also, it is anticipated that this improved understanding of the benefits of non-structural improvements to water quality will result in benefits to the wastewater utility in reducing the overall cost of treatment and disposal.

10.2.9 Sustainable River

Achieving a sustainable river and maintaining long-term Truckee River water quality objectives is essential in continuing to provide for planned growth within the region. The TMWRF provides centralized wastewater treatment for the community. TMWRF must achieve a complex balance among treatment process improvements, effluent reuse needs and water rights requirements, Truckee River water quality, and other inter-related, regional water management objectives. There are numerous opportunities such as river restoration, seasonal modifications of TMDLs for the Truckee River, flow augmentation and water quality pollution trading that have linkages and potential benefits to other water management areas.

In particular, the benefits of effluent reuse must be compared against potential benefits that might be realized from implementation of non-structural Truckee River water quality improvement projects. Obtaining the revised discharge permit for TMWRF was a key success for the region. The Truckee Meadows region needs to continue investigating and pursuing treatment and disposal alternatives that provide for a sustainable river, support an integrated plan for the region's limited water resources, and continue to maintain the economic vitality and environmental objectives of the region.

10.2.10 Effluent Reuse

Use of treated effluent from TMWRF, STMWRF and RSWRF landscape irrigation and wetlands water supply was evaluated in both the Wastewater Facilities Master Plan (Carollo, 1997) and the Reno-Stead Area Effluent Reuse Facility Plan (CH2M Hill, 1996). Some of the potential benefits from reuse of wastewater effluent include:

- Reduced nutrient mass loads from TMWRF to river during most sensitive time of year (summer)
- Reduced TDS loads from TMWRF to river

Effluent reuse also has implications to related water management areas, due to the additional costs for construction of treatment capacity and an effluent distribution and storage network. Reuse may also require the purchase of additional water rights to offset treated effluent that is not returned to the river if the reuse flow exceeds approximately 6,700 af/yr. Effluent reuse must be carefully weighed against the potential benefits that might be realized from implementation of non-structural Truckee River water quality improvement projects and/or discharge permit modifications.

10.2.11 Watershed Management

Current watershed management and protection efforts are directed towards the Truckee River for improvement and protection of surface water quality, drinking water, protection of riparian habitats along stream corridors, storm water quality management, and protection of groundwater quality. Watershed management provides for the maintenance of the land, vegetation and water resources of a drainage basin for the conservation of all its resources.

Water treatment, wastewater treatment and storm water management may all benefit from an effective watershed management program. A healthy watershed will result in less erosion and pollutant loading to the Truckee River, and will improve water quality. Better water quality means fewer improvements to the region's water and wastewater treatment plants.

Low Impact Development (LID) is a new land planning and engineering design approach that should be considered by land use planners and the development community for inclusion in development codes. The goal of LID is to maintain and enhance the pre-development hydrologic watershed conditions. LID has been shown to be a cost-effective means of residential and commercial development. It also has the benefit of reducing construction and maintenance costs to storm water infrastructure.

10.2.12 Flood Plain Management

The community requires coordination among local government agencies in implementing a strong flood plain management program that will minimize future flood risks to people and property. Some of the goals of flood control in the Region include:

- Reduction of flood damages
- Land use design policies and policies on controlling runoff rates and runoff volumes over critical storm runoff periods to protect areas from flooding or increasing flood risk to existing developments
- Consistent drainage design standards for controlling runoff rate and volume

- Set up of a mechanism to fund the capital cost of flood protection and the operation and maintenance of flood protection facilities
- Consistent drainage design and best management practices to deal with water quality monitoring and treatment of storm water runoff.
- River restoration

Again, one of the significant linkages and benefits from river restoration is water quality and wastewater treatment and disposal capacity. It is anticipated that improved water quality will result in wastewater treatment and disposal benefits.

Local governments need to be especially careful in managing development in the period preceding implementation of the Truckee River Flood Management Project to ensure that flood damages to existing properties are not exacerbated. The alternatives being evaluated assume that future conditions in the region will not cause a net loss of flood plain storage volumes nor changes to the base flood elevation. This means that other measures must be implemented within the watershed to manage the runoff from future development.

10.2.13 Stormwater Management

Storm water management facilities such as detention basins can provide for groundwater recharge, as well as better quality groundwater through some natural treatment during sedimentation and percolation. The better the quality of the groundwater, the lower the water treatment costs will be incurred. Depending on whether the groundwater ultimately discharges into the Truckee River, nutrient loading from storm water to the river may be reduced. Storm water BMPs could have a positive impact in terms of TMWRF's ability to meet discharge requirements.

On-site retention is another linkage between storm water and flood control facilities. The reduction in storm water flows, due to on-site retention, may be one of the measures implemented to manage runoff from future development so as not to cause a net loss of flood plain storage volume.

10.2.14 Land Use Planning

The importance of integrating water resource management with land use planning has come to light. Growth in the Truckee Meadows urban area and outlying valleys has lead to questions about the sustainability of the region's limited natural resources. One outcome of this need for coordinated planning was the RWPC's development and adoption of Interim Water Policies in response to the requirement of the October 2002 Regional Plan Settlement Agreement. The policies pertain to water resources and land use, water resource commitments, groundwater recharge, and flood storage mitigation in the Cooperative Planning Areas. The RWPC also developed the Water Resource Baseline as a tool that can be used by local government staff and water purveyors when performing conformance reviews.

In addition to the Interim Water Policies, there are a number of recommendations contained in the Watershed Management and Protection Plan and Regional Storm Water Quality Management Program, Flood Plain Management Strategy, Flood Storage Mitigation Plan for Zones 1 & 2, and Truckee River Watershed Management Programs relating to the need to coordinate land use planning and water resource management.

The Truckee Meadows Regional Planning Governing Board also commissioned a study on the Truckee River watershed managing entities and programs that resulted in recommendations for Regional Planning to:

- Facilitate the development and integration of specific resource management guidance at the regional level for inclusion in local government development codes
- Facilitate the development of a closer working relationship between the RWPC and Regional Planning Commission

10.2.15 Conclusions

Actions taken in one water management area directly affect other management areas. It is important for the region to continue its coordinated and integrated planning efforts to the extent possible to achieve its water resource management objectives. Management decisions affecting the region's water resources also affect land use planning decisions. Closer coordination between water resources and land use management programs will reduce the overall costs borne by the community, and will benefit the entire region

10.3 Planned Improvements

As presented in the prior section, numerous linkages exist between the different water management areas. A proposed action taken in response to one water management area affects the costs and needs of other management areas. Because of these complex inter-relationships, an accurate evaluation of the cost impacts of different actions on one another is not feasible. However, with the understanding of the inter-related regional water issues, a considerable amount of planning has been performed for the water, wastewater and flood management systems in the study area. As a result of these efforts, alternative courses of action have been identified and evaluated, and in many cases, a cost effective course of action has been determined.

Following is a brief summary of the recommended structural and non-structural measures for the water, wastewater and flood managements programs that presently are being implemented within the region. A summary of the estimated costs identified in the Reno, Sparks, Washoe County and TMWA 5-year Capital Improvement Plans is presented. The CIP's from other local entities such as Sun Valley GID, Utilities Inc, and other numerous small water and wastewater purveyors are not included in the financial summary. Capital improvement projections and cost estimates beyond 5 years are not readily available, since plans change as new information becomes available and new priorities are established. Furthermore, some major improvements anticipated beyond the 5-year CIP timeframes are discussed for informational purposes, but their costs are not included in the financial summary.

10.3.1 Potable Water Management Systems

Structural Measures

Surface Water Treatment Plants: Growth within the TMWA delivery system will be served by expanding the surface water treatment and pumping capacity at the Chalk Bluff and Glendale water treatment plants. Two future surface water treatment plants are being implemented by WCDWR to service the South Truckee Meadows area. The first plant that is likely to go on line

is a Lower Water Treatment Plant (WTP) with a buildout capacity of 6.0 MGD. This will probably to be built in increments, potentially as early as 2006. The second plant that has been planned is an Upper WTP with a buildout capacity of 3.0 MGD.

Groundwater Wells: Continued groundwater well development is planned in the TMWA and WCDWR service areas for the purpose of meeting peak demand conditions without the need to oversize more expensive surface water treatment plants, and to provide drought back up and water supply reliability. However, some of these wells have water quality issues, in particular, compliance with the PCE and arsenic standards. Treatment will be required to continue to use these impacted wells as a potable water supply.

New Sources: In 2002, the RWPC performed a detailed analysis of water supply alternatives to support the build-out of planned land uses in Stead / Lemmon Valley and Cold Springs. The analysis concluded that, from a long-term water supply perspective, development of a northern importation project to serve the Stead / Lemmon Valley area would provide greater benefits for the region compared to the Stead Main alternative, at a lower overall cost. An EIS for the North Valleys Water Supply Project is currently being prepared by the BLM. The Project's proponents are two private companies that propose to construct facilities to import annually up to 11,500 af of potable water to the North Valleys from groundwater sources located in northwest Washoe County (Fish Springs Ranch and Dry Valley). If approved, construction of the Projects may be initiated in 2005.

Distribution and Storage Systems: Distribution and storage systems for water service areas are primarily driven by population growth, service area agreements and the nature of development that will occur.

Water Non-Structural Measures

Water Conservation: Water conservation measures will be required to comply with the terms of the Negotiated Settlement. Additional levels of water conservation beyond Negotiated Settlement requirements have been recommended by TMWA as a means of providing additional system economics and greater reserves for drought protection. Currently, toilet, showerhead and water meter retrofit water conservation measures are being undertaken.

10.3.2 Wastewater Management Systems

Structural Measures

Wastewater Treatment Plants: Currently, the 46.48 MGD expansion at TMWRF is planned to begin construction in 2004 and be on-line by 2006. Future plans include treating flows from Glen Meadows and Boomtown plants and service areas. For planning purposes, an expansion to 52.0 MGD has been investigated for the future, which would require optimization of the existing system as well as the addition of some treatment processes.

Improvements to the Reno-Stead Water Reclamation Facility (RSWRF) are currently under design to provide a 2.0 MGD capacity that will be on-line in 2006. As approved in the Regional Water Plan, it is anticipated that sometime in the future, the Lemmon Valley Wastewater Treatment Plant (LVWWTP) may be decommissioned and wastewater treatment and effluent reuse facilities for the region would be centralized at RSWRF.

The South Truckee Meadows Water Reclamation Facility (STMWRF) has recently expanded to 3.0 MGD with potential plans to expand to 6.0 MGD in the near future. The Cold Springs plant has future plans to expand to 0.3 or 0.4 MGD. A study is also being prepared to investigate the feasibility of a satellite wastewater treatment plant for much of the unincorporated area in Spanish Springs Valley.

Collection System: Collection systems for all wastewater service areas are primarily driven by population growth and the nature of the development that will occur, as well as the connection of areas on septic systems.

Effluent Reuse: The wastewater facility planning efforts have included investigations into the market potential and costs of reusing treated effluent for agriculture, wetlands, and landscape irrigation needs. Effluent reuse programs have been implemented for TMWRF, RSWRF and STMWRF. Expansion of the reuse systems will continue to be evaluated as an effective disposal alternative relative to other options.

Wastewater Non-Structural Measures

Non-structural measures were developed for TMWRF as an alternative means of meeting water quality objectives in lieu of providing higher levels of treatment. These non-structural measures are being implemented in combination and at varying levels, as needed, to meet water quality objectives. The measures that were identified include:

Flow Augmentation / Non-Point Source Reduction: The primary strategy for accomplishing flow augmentation and non-point source reduction is to acquire water rights on the main stem of the Truckee River, thereby increasing the instream flows. The flows associated with the acquired water rights would be maintained in the river rather than being diverted for agricultural or other uses. This would result in an increase in instream flows and also reduce the non-point source loadings back to the Truckee River from agricultural lands.

The local entities have already acquired some water rights, and there are plans to purchase more. The benefits of keeping this additional water in the river are twofold. Water quality is improved due to the dilution effect of having additional water in the river as well as the reduced loadings from agricultural diversions, as these flows have been converted to water that is now dedicated to remain in the river. By keeping more water in the river and reducing the number of diversions, there is also the benefit of having an increased quantity of water, which is particularly important in the lower Truckee River where just having enough flow to support the ecology can be an issue. This would also improve the nutrient assimilative capacity of the river through increased dilution, reduce the non-point source nutrient and TDS loadings to the river, and reduce the TDS impact on Pyramid Lake by increasing the inflow to the lake.

Water Conservation: Measures were explored for their potential to reduce capital and operating costs and the nutrient loadings to the river. Currently, toilet, showerhead, and water meter retrofits as water conservation measures are being undertaken.

River Restoration: Local conservation districts are currently conducting several pilot river restoration projects along Steamboat Creek. These projects are targeted at reducing the sediment loading and the habitat degradation within the Steamboat Creek sub-watershed. In addition, the Agencies are working with the Nature Conservancy (TNC) on the McCarran Ranch restoration project, with several other potential projects being considered, including Mustang

Ranch. The McCarran Ranch project encompasses river restoration activities along approximately 11 miles of river. Activities include habitat construction, bank realignment, channel deepening, cottonwood tree planting, establishment of riffles and pools, etc. TNC and Otis Bay Riverine Consultants have developed the planning document for the restoration effort, and funding has been secured for the first phase of this project. Through the implementation of restoration projects, the goal is to improve river habitat, create spawning grounds and habitat, and reduce river temperatures. In addition, these measures may improve the nutrient assimilative ability of the river.

10.3.3 Storm Water / Flood Control Management Systems

Structural Measures

There is a growing body of knowledge forming within the study area regarding alternative types of structural storm water and flood control management measures that, once implemented, will enhance the environment in terms of water quality, aquatic habitat, open space connectivity, erosion reduction, preservation of wildlife and recreational corridors, and maintenance or enhancement of riparian vegetation. Such measures are being integrated into local and regional projects after a thorough evaluation and discussion in a number of public and public/private forums within the region. Following are some of the programs under which the structural aspects of storm water and flood control are implemented:

Local Government Capital Improvement Programs: Each of the local governments in the study area has extensive flood and storm water capital improvements identified for construction over the next five years.

Developer Constructed Improvements: Construction of storm water and flood control improvements by developers in conjunction with new projects is the primary means of implementing portions of regionally planned facilities, particularly in times of rapid community growth when public construction funds are limited and large tracts of land are developed.

Regional Flood Control Improvements: A number of needed regional flood control improvements have been identified through various master planning efforts, most significant among them is the Truckee River Flood Management Project to be constructed in the Truckee Meadows portion of the Truckee River. Another very significant project under development is the North Spanish Springs Flood Detention Facility that will provide flood damage reduction benefits to both the unincorporated area of Spanish Springs and the City of Sparks.

Non-Structural Measures

There are a number of non-structural programs in place or under development that are discussed more fully in Chapters 4 and 5 of this report, examples include: Storm Water Best Management Practices, Watershed Based Water Quality Modeling, River Restoration, Stream Restoration, Stream Buffering, Low Impact Development Techniques, Watershed Based Flood Modeling, Regional Flood Control Master Planning, and Flood Plain Management.

10.4 Financial Summary

Planned structural and non-structural improvements for the water, wastewater and storm water programs in the region are essentially developed. The combination of structural and non-structural programs forms the basis of the utility and local government Capital Improvement

Programs. These improvement projects, which include on-going infrastructure repair and replacement projects, are intended to accommodate planned growth, meet existing and anticipated regulatory requirements, and to extend the useful life of existing assets. Although facility decisions remain, one priority of the region is to strive to maximize the use of existing assets and minimize costs to keep utility rates and charges affordable.

This focus recognizes that there are linkages among the water, wastewater and storm water programs that must be considered if costs are to be managed. The local entities should continue to investigate these linkages and alternatives to develop integrated plans for the region.

10.4.1 Costs Included in the Financial Summary

Costs that have been included in this financial summary were limited to those costs that will affect the rates and charges levied by the utility service providers. The level of analysis dictated by NRS 540A.140 is extensive and would be impractical to include in this plan. Additionally, some of the data required by the statute is not readily available. Therefore, the RWPC has limited this analysis to a summary of available cost data and refers the reader to the CIPs and fee/rate structures of the various utilities and local governments.

Costs that are **included** in this analysis are as follows:

Water Systems

- Water production facilities (surface water treatment plants and wells)
- Major water transmission and storage facilities
- Intertie pipelines between utilities
- System reliability improvements

Wastewater Systems

- Major interceptors
- Treatment plant expansions and upgrades
- Effluent reuse treatment, distribution, storage systems, and groundwater rights
- Non-structural measure costs

Storm Water / Flood Control Systems

- Major interceptors
- Storm water detention facilities

Typical costs **excluded** from the analysis are:

- Developer contributions to the meter retrofit fund
- Costs for the purchase of water rights for new users
- Costs for local water distribution facilities
- Costs for local sanitary sewer collection facilities
- Costs for contaminated well remediation that will be paid by the remediation district
- Costs for regional and other major facilities that will be paid directly by developers benefiting from the project (exclusive of connection fee costs)

10.4.2 Summary of Costs

The general approach to rate setting is to recover the capital costs of system expansions from new users through connection fees and/or special assessment districts and to recover the costs of system improvements, operations, and maintenance from all users through service charges. Special assessment district levies are also sometimes utilized for the recovery of system rehabilitation, replacement and/or improvement costs if those project benefits are limited to only a portion of the service area. Based on this rate setting philosophy, Tables 10-2 through 10-5 present a summary of the planned water, wastewater and storm water / flood control CIP expenditures.

A summary of the projected 5-year cost requirements for water, wastewater and storm water facilities is presented in Table 10-6. Over $683 million, or an average of approximately $136 million per year, will be spent on water resource improvement projects.

In addition to these planned 5-year CIP projects, there are other proposed projects on the horizon that may have a financial impact on the community that are not included in the financial summary. Some of the significant projects include:

- TMWRF expansion to 53 MGD, $67 million
- North Valleys Water Supply Project, $53 million
- RSWRF expansion to 4 MGD, $12 million
- RSWRF effluent disposal, $17 to $30 million

The magnitude of these planned and proposed expenditures confirms the need to continue the region's integrated water resource and land use planning efforts.

10.4.3 Incremental Rates and Fees

Incremental connection fees and annual service charges for a single-family residence in the planning area can not be calculated from this information. Actual rates and fees will vary by utility provider, depending on:

- Actual distribution of costs among the utilities
- Cost sharing agreements reached between the participating agencies and utilities
- Other costs that will be incurred that were excluded from this analysis
- Existing costs for debt service, operation, maintenance and replacement

Table 10-2
Washoe County Projects

Component Description	Planning Period	Program Cost
Water Projects		
Supply Improvements	2004-2009	$20,102,000
Treatment Improvements	2004-2009	$32,020,000
Arsenic Compliance	2004-2008	$7,361,000
Distribution Improvements	2004-2009	$27,491,000
Storage Improvements	2004-2009	$12,215,000
Information Technology (IT)	2005-2008	$250,000
Sub-Total		**$99,439,000**
Wastewater Projects		
Wastewater Treatment	2004-2009	$34,350,000
Collection / Interceptors	2004-2009	$19,830,000
Reuse	2005-2009	$18,690,000
Sub-Total		**$72,870,000**
Storm Water / Flood Control Projects		
Flood	2005-2008	$104,000,000
Stormwater	2004-2008	$16,525,000
Sub-Total		**$120,525,000**
Washoe County Project Total		**$292,834,000**

Table 10-3
Truckee Meadows Water Authority Projects

Component Description	Planning Period	Program Cost
Supply Improvements (Dams, Flumes, Ditches)	2004-2008	$7,850,000
Supply Improvements (Well Development)	2004-2008	$9,950,000
Treatment Improvements	2004-2008	$18,300,000
Arsenic Compliance	2004-2008	$67,000,000
Distribution Improvements	2004-2008	$54,085,000
Storage Improvements	2004-2008	$23,100,000
Hydroelectric Plant and Flume Improvements	2004-2008	$2,875,000
Customer Service	2004-2008	$24,809,000
Transportation, IT, General	2004-2008	$12,612,000
Truckee Meadows Water Authority Project Total		**$220,581,000**

Table 10-4
City of Reno Projects

Component Description	Planning Period	Program Cost
Wastewater Projects		
Treatment Improvements (TMWRF)	2004-2008	$32,777,000
Treatment Improvements (RSWRF)	2004-2008	$12,000,000
Reuse – Facilities	2004-2009	$17,000,000
Reuse - Water Rights	2004-2012	$15,000,000
Collection / Interceptors	2004-2008	$13,000,000
Collection R&R	2004-2008	$30,000,000
Sub-Total		**$119,777,000**
Storm Water/ Flood Control Projects		
Storm Drainage	2004-2012	$9,000,000
Storm Drainage R&R	2004-2008	$3,750,000
Sub-Total		**$12,750,000**
Non-Structural		
River Restoration	2004-2008	$4,080,000
Conservation	2004-2008	$586,500
Sub-Total		**$4,666,500**
City of Reno Project Total		**$137,193,500**

Table 10-5
City of Sparks Projects

Component Description	Planning Period	Program Cost
Wastewater Projects		
Treatment Improvements (TMWRF)	2004-2008	$12,254,000
Collection / Interceptors	2004-2008	$3,140,000
Reuse – Piping	2004-2008	$1,000,000
Reuse – Water Rights	2004-2008	$6,000,000
Sub-Total		**$22,394,000**
Storm Water / Flood Control Projects		
Storm Drains	2004-2008	$9,795,000
Sub-Total		**$9,795,000**
Non-Structural		
River Restoration	2004-2008	$768,000
Sub-Total		**$768,000**
City of Sparks Project Total		**$32,957,000**

Table 10-6
Summary of Projected 5-Year Wastewater, Flood, and Water Facility Costs

Local Entity	Wastewater Estimated Costs	Flood Control / Stormwater Estimated Costs	Water Estimated Costs	Total
Washoe County	$72,870,000	$120,525,000	$99,439,000	$292,834,000
TMWA	-	-	$220,581,000	$220,581,000
Reno	$124,443,000	$12,750,000	-	$137,193,000
Sparks	$23,162,000	$9,795,000	-	$32,957,000
Total	$220,475,000	$143,070,000	$320,020,000	$683,565,000

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