

PROGRAM PREFERENCES

**Attachment 9 -Program Preferences**

**Tahoe Sierra**

As shown in Table 9-1 and the narrative below, specific projects that make up the Tahoe Sierra Proposal were developed considering many IRWM program preferences.

**Table 9-1 Tahoe Sierra Proposal Projects That Support IRWM Program Preferences**

<b>Attachment 9 Tahoe Sierra Proposal Projects That Support IRWM Program Preferences</b>							
<b>Program Preferences</b>	<b>Include regional projects or programs (CWC 10544)</b>	<b>Effectively integrate water management programs and projects within a hydrologic region identified in the California Water Plan or RWQCB region or subdivision or other region or subdivision identified by DWR</b>	<b>Effectively resolve significant water-related conflicts within or between regions</b>	<b>Contribute to attainment of one or more of the objectives of the CALFED Bay-Delta Program</b>	<b>Address critical water supply or water quality needs of DACs within the region</b>	<b>Effectively integrate water management with land use planning</b>	<b>For eligible SWFM funding, projects which: a) are not receiving State funding for flood control or flood prevention projects pursuant to PRC §5096.824 or §75034 or b) provide multiple benefits, including, but not limited to, water quality improvements, ecosystem benefits, reduction of instream erosion and sedimentation, and groundwater recharge.</b>
<b>Specific Projects of the Proposal</b>							

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<b>Alpine Watershed Group---- Markleeville Guard Station Restoration project</b>	<b>X</b>	<b>X</b>				<b>X</b>	<b>X</b>
<b>Truckee River Watershed Council - Negro Canyon</b>							
<b>Town of Truckee - Stormwater Monitoring</b>	<b>X</b>	<b>X</b>				<b>X</b>	
<b>Washoe Tribe--- Woodfords Water Supply Improvements</b>					<b>X</b>		
<b>Tahoe Resource Conservation District---Aquatic Invasive Species program</b>	<b>X</b>	<b>X</b>				<b>X</b>	
<b>Tahoe City Public Utility District---West Lake Tahoe Regional Water Treatment</b>	<b>X</b>	<b>X</b>	<b>X</b>		<b>X</b>		
<b>South Tahoe Public Utility District---BMP Implementation/Regional Water Conserve</b>	<b>X</b>	<b>X</b>			<b>X</b>		
<b>Placer County---Griff Creek Restoration and Kings Beach Water Quality Improve</b>	<b>X</b>						
<b>Tahoe Regional Planning Agency---BMP Implementation</b>	<b>X</b>	<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>	

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**Include integrated projects with multiple benefits:** Together, all of the above projects comprise an integrated suite with multiple benefits. Five of the projects listed above (Nos. 3, 4, 6, 7, and 9) focus directly on addressing regional water quality issues through a combination of implementing Best Management Practices (BMPs), regional stormwater monitoring and restoration activities. Project #9 specifically includes the installation of stormwater treatment and infiltration as well as stabilization of eroding areas and restoration of disturbed soils. All of these projects are expected to show additional benefits in terms of ecosystem restoration, ground water replenishment, non-point source pollutant control and/or stormwater and flood attenuation.

Three projects listed above (Nos. 4, 6 and 7) focus mainly on water supply and conservation strategies for local communities within the Tahoe Sierra IRWM. Urban water suppliers within the Tahoe Sierra IRWM region, including South Tahoe Public Utility District (STPUD), Tahoe City Public Utility District (TCPUD), and North Tahoe Public Utility District (NTPUD), created a regional approach to water conservation practices in the Lake Tahoe basin in 2012, utilizing Prop 84 Round One IRWM Implementation Funds. In this current application, the regional outreach has expanded to include the Washoe Tribe of California and Nevada, a water supplier in Alpine County. The initial efforts of the regional program were focused on coordinating with the partners and the exchange of water conservation information and materials. Additional benefits of these projects may include pollutant load reductions, ecosystem enhancement and groundwater replenishment.

Project # 3 above proposes to develop a comprehensive monitoring strategy that will assist in evaluating the effectiveness of stormwater management programs and projects that inform decisions made by regional land use managers regarding TMDL load reductions. The project began implementing Phase 1 in 2009 and currently, the regional outreach includes partnering with both Placer County and the Truckee River Watershed Council facilitating the exchange of information and consolidation of funding sources.

Four of the projects above (Nos. 1, 2, 5, and 8) contribute to ecosystem restoration objectives which attain multiple benefits including habitat enhancement, water supply, stormwater and flood attenuation and ground water replenishment. Three of these projects (Nos. 1, 2 and 8) will directly address stream channel restoration and contribute to enhanced water treatment either through direct replacement of the aging infrastructure or through restored hydrologic function to reduce nutrient and sediment loads. Project #5 projects aquatic habitats, water quality and water supply by developing and implementing a regional aquatic invasive species prevention outreach program.

All of the projects listed above will also help to foster environmental stewardship through the development of educational materials and outreach to key stakeholders and local communities. Project integration and agency coordination is also an added benefit of all projects listed within this proposal.

**Effectively integrate water management programs and projects within a hydrologic region identified in the California Water Plan or RWQCB region or subdivision or other region or subdivision identified by DWR:** All 10 of the projects in this proposal are located within the established regional boundary of the Tahoe Sierra IRWM. This region has been recognized and approved by DWR through the IRWM Regional Acceptance Process (RAP). Located within the Northern Lahontan region, the Tahoe Sierra IRWM and associated projects are subject to management criteria established by the Lahontan RWQCB and representatives of the Lahontan

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Water Board are key advisory members to project partners and implementation components. There are 13 water bodies within the region, including Lake Tahoe, that have been identified as impaired waterbodies, with a number of these water bodies either currently implementing or in the process of developing a TMDL to address the specific impairment. Specifically, seven projects (Nos. 1,3, 4, 5, 6,7 and 9) address the integration of water management programs within the Tahoe Sierra IRWM and one of the six projects (Nos. 5) proposes to reach inter-regionally into adjacent IRWM groups such as the Cosumnes American Bear and Yuba IRWM known as CABY.

### **Effectively resolve significant water-related conflicts within or between regions**

While all of the projects address water-related issues, two of the projects above (Nos. 6 and 9) directly address water-related conflicts within the Tahoe Sierra IRWM. Specifically in project #6 there are eight separate water systems and each system utilizes different groundwater sources for water delivery. This creates inefficiencies and redundant delivery needs and ultimately creates a delivery system that is significantly undercapitalized to meet the needs of today's drinking water standards. In addition, each of the eight water systems has source capacity issues for either their primary or back-up sources and there is a lack of adequate storage to meet fire suppression standards throughout the area. The communities relying on these groundwater systems are currently vulnerable to the reliability of water delivery should a significant drought in the region. These conflicts will be resolved through the construction of a permanent all-season surface water treatment plant utilizing Lake Tahoe as the water source. Project # 9 seeks to resolve the conflict between the need to preserve the pollutant –filtering capabilities of the Lake Tahoe watershed, while still allowing for the infrastructure necessary to support residents and visitors. Installation of BMPs provides mitigation for the negative effects on water quality that result from development. Together these projects will address these water-related conflicts on an integrated, regional basis.

### **Contribute to attainment of one or more of the objectives of the CALFED Bay-Delta Program**

The suite of projects submitted under the Tahoe Sierra IRWM does not propose to attain objectives of the CALFED Bay-Delta Program.

### **Address critical water supply or water quality needs of disadvantaged communities within the region:**

Disadvantaged communities within the Tahoe Sierra region include the City of South Lake Tahoe and Kings Beach within the Tahoe Basin as well as the entire population of Sierra County. All projects planned and implemented in the areas identified as a disadvantaged community will include outreach targeted to historically underserved populations to attempt to engage them in the stakeholder process. Appropriate avenues of communication will be utilized (e.g. bilingual public notices and outreach materials in Spanish speaking neighborhoods). One of the projects (No. 4) will address needs entirely within a disadvantaged community and three projects (Nos. 6, 7 and 9) will implement a portion of the project components within disadvantaged communities. The water supply and water quality projects implemented within disadvantaged communities will serve to ensure adequate drinking water for populations located within disadvantaged communities. In addition project implementation will result in a reduction of pollutants entering into the water supply system and will help to improve the quality of life for community members within these targeted areas.

Project No. 4, will address both critical water supply need and water quality needs in its severely disadvantaged community of Woodfords in a remote and rugged area of eastern Alpine County

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within the Carson River watershed. This Tribal Community is within the Tahoe Sierra IRWM accepted boundary. Project No. 4 is a comprehensive water conservation program including water meter repairs and concurrent monthly water use data collection with emphasis on customer education and leak detection/ pipe repairs/pipe replacement. Project No. 4 will be closely coordinated with Project No. 7 and share knowledge, resources, and costs.

Project No. 6 will directly address an area with a portion of it comprising disadvantaged communities, by providing critical water supply needs through a reliable secondary water source for adjacent water systems.

Project No. 7 encompasses several identified disadvantaged communities in the Tahoe Sierra IRWM region. St. Joseph's Community Land Trust is a non-profit housing entity that owns and manages several affordable housing properties within the boundaries of South Lake Tahoe. One of these properties, Sierra Gardens Apartments, is a 76-unit community located on approximately 4 acres within the city limits of South Lake Tahoe. Residents must income-qualify for the affordable housing units under strict Housing and Urban Development (HUD) guidelines. The regional water use efficiency program will directly address water supply for this community by implementing water conservation practices on site. In addition to Sierra Gardens Apartments, Project No. 7 will also provide water conservation incentives to residents in the district's service area, many of whom reside in the City of South Lake Tahoe, a designated Disadvantaged Community within the region. Another identified DAC is Kings Beach on the north shore of Lake Tahoe. This community is within the service area of the Tahoe City Public Utility District (TCPUD), a partner in the regional water use efficiency program proposed in this application. TCPUD will also be providing water conservation incentives to the residents of this DAC. Although water supply is not critical within these DAC areas, the need to conserve water, and thus reduce the economic impact of water costs to residents, is critical at this time. The water suppliers have focused on implementing water conservation practices in Disadvantaged Communities due to the impact of water meter installation mandates such as AB1420 and Division 1, Chapter 8, Article 3.5 of the California Water Code (sections 525 through 529.7 inclusive). In complying with these water meter laws, water suppliers are seeing economic hardship to disadvantaged community residents, especially as pertaining to tiered water rates and increases in basic water service charges to accommodate the need for additional infrastructure. In addition, the need for water conservation outreach activities is greater in these communities, especially the incentives to replace leaking appliances, toilets, showerheads, etc. As all water suppliers share the need to address these concerns, the Regional Water Use Efficiency Program will focus on establishing a central web-site (utilizing the Tahoe Sierra IRWM website developed during the plan revision process); researching bulk orders of water efficient showerheads, faucets, etc to save on costs for all agencies; sharing personnel expertise among agencies; and uploading data on water savings to a central site.

Project No. 9, will address the DAC's of the City of South Lake Tahoe and Kings beach by creating neighborhood-specific outreach for these areas within the project with the intent of increasing BMP implementation in these areas and improving water quality.

**Effectively integrate water management with land use planning:** Although the projects listed above do not integrate water management with land use planning in the traditional sense of new development and water supply considerations, five of the projects (Nos. 1, 2, 3, 5, and 9) will have

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an impact on the decisions made by land managers within the Tahoe Sierra Region. Project Nos. 1 and 2 addresses the integration of water management and land use planning by restoring floodplain function and reducing erosion and thereby reducing conflicts of flooding and erosion caused by the property. Specifically, for Project No. 1, the existing use of the property has altered the natural form and function of the stream. In its current condition, the property is inconsistent with several of the County Code (16.08.020) provisions such as 1) “preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters of which man increase hazards in other areas” and 2) “controlling the alteration of natural flood plains, stream channels and natural protective barriers which help accommodate or channel floodwaters.” The County General Plan also prohibits any “encroachments into the floodplain which could adversely affect the velocity, volume or direction of flood flows in a manner which could create threat to public health and safety shall be prohibited in those zone” (Element II, Section D, Policy 23a). Project No. 2 addresses this integration by decreasing excessive erosion through bank stabilization and preservation of trails through a partial re-route of the stream. Past land uses have caused significant drainage alterations and during storm events, erosion from the watershed is severe. Erosion in the watershed not only impacts water quality and habitat, but is also impacting the recreational road and trail network.

Project No. 3 will provide integration by evaluating and analyzing the data in a comprehensive manner, to better understand the overall picture of the watershed both spatially and over time. The data will be used to make Land Use decisions, Stormwater Management Program effectiveness evaluations and stormwater capital improvement project recommendations.

Project No. 5 addresses land use planning by informing land use planners of the negative consequences of aquatic invasive species introductions while providing tangible and well-coordinated, solution-oriented tools. This will allow land managers to make decisions and to prioritize areas in need of protection or improvement. These decisions may translate directly into revisions or changes to local or regulatory standards and codes. For example, access to unprotected water bodies will be directly addressed through regional outreach committee development to utilize consistent protocols for watercraft inspection and education.

For Project No. 9, the Tahoe Regional Planning Agency (TRPA) is charged with the mission of protecting Lake Tahoe’s environment through land use planning. The BMP Retrofit Program supports the Regional Plan including the TRPA Goals and Policies Land Use and Conservation Elements as well as Chapter 60.4 of the TRPA Code of Ordinances.

**For eligible SWFM funding, projects which: a) are not receiving State funding for flood control or flood prevention projects pursuant to PRC §5096.824 or §75034 or b) provide multiple benefits, including, but not limited to, water quality improvements, ecosystem benefits, reduction of instream erosion and sedimentation, and groundwater recharge.**

One project within the suite of proposed projects is eligible for SWFM funding (Nos. 1). Project No. 1 will reduce the risk of inundation due to flooding and reduce the risk of pipe failure due to shallow depth/cover exposure by relocating the gravity sewer mains and manholes out of the floodplain restoration area. Construction of a new sewer pump station at a more accessible location (off HWY 88) will provide improved access to the facilities during all weather (and flooding) conditions, replace a critical piece of infrastructure nearing the end of its service life, and allow provisions to

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increase or mitigate the response time prior to sanitary sewer overflows. By removing the existing sewer pump station from its current location, the flood plain restoration project can incorporate an improved design at the confluence of Millberry Creek and Markleeville Creek to simulate natural conditions and reduce erosion/scour.

### **Statewide Priorities**

As shown in Table 9-2 and the narrative below, specific projects that make up the Tahoe Sierra Proposal were developed considering many statewide priorities.

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**Table 9-2 Tahoe Sierra Proposal Projects That Support Statewide Priorities**

Table 9.2 Statewide Preferences Tahoe Sierra IRWM								
Statewide Priorities →	Drought Preparedness	Use and Reuse Water More Efficiently	Climate Change Action Responses	Expand Environmental Stewardship	Practice Integrated Flood Management	Protect Surface Water and Groundwater Quality	Improve Tribal Water and Natural Resources	Ensure Equitable Distribution of Benefits
Specific Projects of the Proposal ↓								
1. Alpine Watershed Group---- Markleeville Guard Station Restoration project		X	X	X	X	X	X	X
2. Truckee River Watershed Council - Negro Canyon	X		X	X	X	X		
3. Town of Truckee - Stormwater Monitoring				X		X		
4. Washoe Tribe--- Woodfords Water Supply Improvements			X	X		X	X	
5 Tahoe Resource Conservation District--- Aquatic Invasive Species program				X		X	X	X
6. Tahoe City Public Utility District---West Lake Tahoe Regional Water Treatment	X	X	X	X		X		X
7. South Tahoe Public Utility District---BMP Implementation/Regional Water Conserve	X	X	X	X				
8. Placer County – Griff Creek Restoration and Kings Beach Water Quality Improvement	X		X	X	X	X		
9. Tahoe Regional Planning Agency – BMP Implementation	X	X	X	X	X	X		X

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**Drought Preparedness:** Six project listed above will help to sustain the Tahoe Sierra Region through anticipated drought periods are focused on increasing available water supply, water conservation practices, ecosystem restoration and groundwater replenishment. Two projects (Nos. 4 and 7) propose to directly promote water conservation, conjunctive use, reuse and recycling. As water suppliers within the region utilize both groundwater and surface water supplies to provide drinking water, water conservation efforts help to slow drought impact on these water sources. Particularly important is the water metering, meter repairs, leak detection, pipe repairs and pipe replacements. The implementation of a large scale water use efficiency program will help to increase property owner's awareness of the necessity of water conservation and effect of drought on a regional water supply. Specifically, these projects improve landscape and agricultural irrigation efficiencies by implementing a turf removal program that improves landscapes, emphasizes native plants used to the indigenous rainfall, irrigation efficiencies by plating these low moisture requiring, drought tolerant, native or adaptive plants instead of turf and offering incentives to replace current irrigation systems with drip irrigation or low-water use irrigation systems. Lawns are also the most water intensive landscaping option a homeowner can choose. Non-functional lawns- ones that are rarely used –waste water and represent an ongoing cost in both time and resources for the home or business owner. Considering the regional and specifically the turf removal/irrigation efficiency program has a 20 year industry life span, once implemented, and results in large volumes of water savings annually. Estimates of annual water savings are 22 gallons for every square foot of turf removed. \* As the project anticipates a total of 126,000 square feet of turf removal, this equates to 2,772,000 gallons of water per year saved, times the 20 year industry life span is 55,440,000 gallons of long term reduction of water usage. Also, included in the program are leak detection/repair incentives ; high efficiency toilet rebates; water efficient clothes washer rebates; and water audits for all water users. The long term calculations justification for the reduction in water use for these best management practices (1,065,812 MG annually) can be found in Attachment 7: Technical Justification of Projects, Table 9: Annual Project Physical Benefits of this application.

**\*The Handbook of Water Use and Conservation: Homes, Landscapes, Business, Industry, Farms; Amy Vickers, May 2001**

Project #9 supports water conservation by promoting the use of native and adapted plants for re-vegetation and helps to replenish groundwater supplies by implementing Low Impact Development techniques such as stormwater infiltration to help replenish and protect groundwater supplies.

Project #6 prepares the region for drought by constructing a surface water treatment plant, reducing the dependence on groundwater sources which can be threatened by drought. This integrated surface water treatment plant provides enough capacity to establish system interties between the eight small water systems providing a viable and reliable alternative to groundwater. Also, during periods of drought, the Lake Tahoe Basin is more susceptible to wild land fire. This project increases water storage capacity for the region which greatly increases the fire suppression capability for the area.

Projects #2 and 8 restore key floodplain and SEZ ecosystems that will help to retain snowmelt and rainwater during longer periods of inactivity or potential drought. This action in turn, will help to replenish local groundwater supplies and aquifers and to maintain an additional water source for use in the future as needed.

**Use and Reuse Water More Efficiently:** Five of the projects listed above (Nos. 1, 4, 6, 7, and 9) address the use, capture, storage and/or treatment of water. Two of these projects (Nos. 1 and 9) achieve efficiencies

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through the capture and treatment of stormwater runoff where implementation of these projects and the incorporation of LID techniques will reduce or eliminate stormwater runoff. These practices help to restore a natural and functioning ecosystem where stormwater runoff that might otherwise flow across impervious surface areas is allowed to infiltrate into local groundwater systems or enter into local waterbodies, thus helping to ensure an adequate water supply into the future.

Projects # 4 and #7 propose to increase urban water use efficiency measures through the implementation of a variety of water conservation best management practices. Many of these are suggested by the California Urban Water Conservation Council (CUWCC) and/or required of utility operations programs that have adopted the Memorandum of Understanding with the CUWCC. Project #7 adopted the MOU in 2009 and is currently reporting the implementation of water conservation best management practices within its service area. Project #4 also will consider utilizing the publications and expertise of the American Water Works Association and the various publications and analysis of a well-known water conservation author, William Maddaus, AWWA Award Winner, 2011. In addition, use and reuse water more efficiently is a water conservation activity that is in fact a part of Native American cultural practices so has been ongoing in the Woodfords Community. Both projects have chosen several of the best management practices that result in the greatest water use efficiency to implement in the region: turf removal/irrigation efficiency, high efficiency toilets; water efficient clothes washers; leak detection and repair; and water audits for all water users. Leak detection, meter/radioread transceiver repair, and pipe repairs/replacements are expected to be a large part of the long term, 20 year reduction in water use.

Project # 6 increases water use efficiency for the region by eliminating existing redundancies in the water system delivery between the eight small water systems. The new integrated surface treatment plant will increase water supply reliability by eliminating the reliance on groundwater wells and by providing secondary source capacity for up to eight water systems. Groundwater wells have shown to be vulnerable to drought so by diversifying sources with a surface water treatment plant, the region would have a reliable alternative water source, adapting to climate change.

**Climate Change Action Responses:** Various studies\* \*\* have been conducted in the last decade to measure the effects of climate change in the Lake Tahoe basin. The results of these studies have indicated three major changes are occurring in the basin: 1) the air temperature is increasing, 2) the percent of total annual precipitation falling as snow is decreasing, and 3) the timing of the spring snowmelt peak discharge is shifting towards earlier dates. Climate change scenarios for the Tahoe basin also indicate increased use of groundwater to accommodate population growth. In the Sierra Nevada mountain range, the winter snowpack holds an average of 15 million acre-feet of water that is released in the spring and early summer, acting as the state's largest storage reservoir and a source for recharging groundwater aquifers. Currently, California's Department of Water Resources (DWR) is projecting a 25% reduction in the Sierra snowpack by mid-century. In the Lake Tahoe basin the shift from rain to snow and the shift in timing of snowmelt toward earlier dates appear to be the main causes of the declining snow pack. It has also been found that the effects of climate warming on the snow pack is strongly related to elevation, with the highest amount of loss occurring between the elevations of 1300 and 2200 meters. 53.4% of the Tahoe basin lies within this elevation range.

Seven projects within the suite of projects (Nos. 1, 2, 4, 6, 7, 8 and 9) address climate change by recognizing that there may be increased variability and uncertainty of the amount of surface water runoff that will be available for immediate use or for replenishment of groundwater reserves. Three projects (Nos. 1, 2, and 8) focus on the restoration of historic floodplain areas along tributaries that have been

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channelized due to past development activities. Reestablishing a functional floodplain will allow the stream corridor to accommodate variable flows in the future. In addition, due to the potential for earlier spring run-off, it will be highly important for these areas to serve as natural storage areas. Floodplains offer some amount of water storage which improves late season, in-stream flows. The incorporation of significant increases of native vegetation within these disturbed areas will serve as a source of carbon sequestration, helping to alleviate increasing temperatures that may be a result of climate change. These restored areas will also provide critical habitat for native flora and fauna helping to sustain a natural and functioning ecosystem.

Two projects (Nos. 4 and 7) will directly address climate change considerations by promoting increased water-use efficiency and conservation practices on a regional scale. By promoting water conservation measures now, including removing turf and replacing it with water saving landscaping and irrigation practices, and maintaining an aggressive water use efficiency program, the regional water suppliers can mitigate potential future water shortages. Also, by implementing conservation measures now, more water will be available in the basin, and ultimately for other end (downstream) users outside the Tahoe basin. The increase in water-use efficiency is also expected to lead to a decrease in overall energy consumption and greenhouse gas emissions. The reduction of energy consumption has a direct correlation to the reduction of Greenhouse Gas (GHG) Emissions. Utilizing the Greenhouse Gas Equivalencies Calculator as designed by the US Environmental Protection Agency and entering the estimated 11,850 kWh of annual electricity saved by the water use efficiency program, the calculator estimates 13.5 Metric Tons of Carbon Dioxide Equivalent would be saved from entering the environment through the successful implementation of the regional water use efficiency program. Typically, urban water suppliers have large energy consumption rates due to the need to pump, treat, convey and distribute water supply. In addition, the majority of this water will then ultimately need to be re-conveyed and treated as wastewater. As stated in the California Energy Commission's 2005 Integrated Energy Policy Report, annual electricity use in a typical urban water system in Northern California is estimated to be 3,950 kWh/MG of water. This estimate includes supply & conveyance, water treatment, distribution, and wastewater treatment. Based on this figure, it is anticipated that the proposed project will reduce energy consumption by water suppliers by an approximate 15,159 kWh of electricity per year. Calculation is as follows:

- 1) *Total Water Savings: Approximately 4,827,812 MG per year (implementation of all water conservation best management practices)*
- 2) *Total Electricity Savings: 4,827,812 MG x 3,950 kWh per MG = 19,069 kWh of electricity saved per year, or 379,200 kWh over the expected life of the project (up to 20 years).*

Project #6 will provide a consolidated approach to more efficiently use and manage limited water resources among eight separate water systems along the West Shore of Lake Tahoe which are dependent on groundwater sources. Building a surface water treatment plant diversifies the water sources, allowing the region to adapt to climate change. Also, the use of both groundwater and surface water allows for the better conservation of resources and flexibility to address changing conditions. In addition, building a regional water treatment plant reduces the number of energy consuming facilities and allows for more proactive management to reduce energy demand and resulting GHG emissions. The regional water treatment plant will be an upgrade to new technology and equipment which is significantly more energy efficient than what is currently being used with the eight separate water systems. These water systems were all constructed well over 40 years ago and have older equipment that does not meet today's energy efficient standard. Since a regional treatment plant reduces the need for duplicative facilities it will also

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reduce vehicle miles travelled for maintenance and monitoring. It is estimated that the regional treatment plant will result in an annual reduction of 7,720 vehicle miles traveled. This reduction in vehicle miles traveled provides a reduction in greenhouse gas emissions.

In project # 9 climate change is addressed through the installation of BMPs and restoration of disturbed areas on private properties. This will help to reduce the amount of runoff entering Lake Tahoe from these events thereby minimizing the pollutants entering the lake and mitigating flood risk.

All projects to be implemented through this proposal will undergo extensive review regarding the impacts on climate change and will strive to adapt to changing conditions and/or new technology as necessary.

\* Climate change in the Tahoe Basin: regional trends, impacts and drivers, Robert Coats

\*\* Climate Change Impacts on California's Water, State of CA-Dept of Water Resources

**Expand Environmental Stewardship:** All of the projects listed above strive to expand environmental stewardship through the development of education and outreach materials, increase in awareness of local environmental issues, hands-on participation and increased communication and collaboration amongst partnering agencies. Many of the projects will involve public input, inspire community participation and broaden citizen involvement, particularly through watershed volunteers as in Project #1. Local and regional media will be utilized to broadcast opportunities for public input and in general, the importance of the projects. Additionally, where appropriate and feasible, key elected officials and agency representatives will be engaged to help inform future management decisions related to water infrastructure, supply and implementation activities. The diverse stakeholder groups within the Tahoe Sierra region and the extensive natural resource base provides vital opportunity to involve stakeholders in meaningful discussions about how to promote environmental stewardship and increase awareness amongst community members and participating agencies. It is expected that the extensive outreach conducted and the representation of a diverse set of agencies and organizations that have a stake in water management within the Tahoe Sierra IRWM will result in the development of integrated regional solutions that encourages environmental stewardship and incorporates multiple benefits to both the environment and local communities.

**Practice Integrated Flood Management:** Most flood management efforts in the Tahoe Sierra region have focused on the restoration of natural flood zones. In most communities restoration of wetlands and other SEZs has been a priority for decades. Five of the projects above (Nos. 1, 2, 4, 8, and 9) address flood management through either restoration or through projects that incorporate stormwater capture and retention to help provide infiltration capacity and groundwater retention.

Three projects (Nos. 1, 2, and 8) which has been subjected to significant and repeated flooding over the years, will integrate flood management by completing floodplain restoration; and project #1 specifically will also relocate the gravity sewer mains and manholes out of the floodplain restoration area to reduce the risk of inundation due to flooding and reduce the risk of pipe failure due to shallow depth/cover exposure. The reconstruction of the floodplain will permit restored streams to overflow i banks and eliminate the current "gun barrel" effect. Properly planned restoration projects will permit the streams to meander more naturally allowing it to access historical channels. In addition, restoration will prevent further incising of the channels that have resulted from increased flow rates due to stream confinement with narrowly constructed channels.

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Project #4 will have multiple benefits that include, improved flood protection, more sustainable flood and water management systems, and enhanced floodplain and wetland ecosystems. Specifically, several buildings, located in a drainage wash and sub-basin to Indian Creek, will receive improved flood protection by correcting current sewer system leaks designed to keep saved water in the groundwater reserves.

Project #9 will result in the utilization of LID techniques such as the installation of infiltration systems on private parcels and stormwater pretreatment and filtration systems to protect groundwater and reduce the potential for flooding. Implementation of stormwater retention basins and LID techniques will also help to reduce the volume, flow rate and increased stormwater velocities that cause erosion and transport sediment and nutrients into local water bodies.

**Protect Surface Water and Groundwater Quality:** All of the projects included in this proposal are developed to protect surface water and groundwater quality.. Many of the projects listed above (Nos. 2, 3, 5, 6, 8 & 9) implement components that will help to protect 303d listed impaired water bodies under the Clean Water Act. As noted above, projects proposed will also help to replenish groundwater supplies, restore critical floodplain and SEZ ecosystems and re-establish natural water filtering processes.

Three projects (Nos. 1, 2, and 8) directly contribute to the protection and improvement of water quality through restoring the functionality of Stream Zone Environment and floodplain which will benefit the health of the watershed in multiple ways. Channel confinement has resulted in accelerated water velocities, leading to increased bank erosion and channel incision downstream. A restored floodplain will allow the trapping of sediments and nutrients during overbank events protecting downstream habitat and the water quality of receiving water bodies.

Two projects (Nos. 1 and 9) will address polluted stormwater runoff and will safeguard environmental health and restore surface water quality through the installation of stormwater treatment BMPs. These projects will reduce impact of stormwater flow coming from impervious surface areas and assist in meeting local TMDL and NPDES standards.

Project #3 includes the main stem of the middle Truckee River and all areas contributing surface water runoff between its outlet from Lake Tahoe and its confluence with Juniper Creek (approximately 210 square miles). Preliminary screening for potential source areas was conducted using an integration of GIS data on land use, land condition and other human disturbances. The analysis resulted in the classification of each sub-watershed as low, medium or high disturbance. The project was subsequently designed to focus monitoring resources and efforts on those high disturbance sub-watersheds where water quality is expected to be the most impaired and where the majority of actions are expected to be implemented. The data results from monitoring are used to prioritize areas for storm water infrastructure improvements, assist with Land Use decisions, and stormwater program effectiveness evaluations.

Project #4 will achieve surface and groundwater protection through improvement in the sustainability of the Woodfords Community infrastructure, sewer treatment capacity, and water quality and water quantity in the aquifer which will sustain the Community for years to come.

Project #5 contributes to the protection of surface water through preventing the introduction of aquatic invasive species. Aquatic invasive species threaten water quality by altering aquatic habitats, disrupting food webs, increasing nutrient cycling, and clogging intake pipes and navigation. These associated impacts

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can have dramatic costs to control or otherwise maintain where introductions have become infestations. Therefore, the protection of surface water includes a cost benefit to provide sustainable, clean water to communities.

Project #6 is a surface water treatment project which protects water quality and secures safe water supplies for the region. Currently there are eight small water systems that are all dependent on groundwater sources for water delivery. This integrated surface water treatment plant provides enough capacity to establish system interties between the eight small water systems, providing a viable and reliable alternative to groundwater for the region. By supplementing groundwater sources with surface water for the region, this secures safe drinking water supplies, safeguarding public and environmental health.

**Improve Tribal Water and Natural Resources:** Three of the projects above (Nos. 1, 4, and 5), when implemented, will improve Tribal water and natural resources through collaboration and partnerships as related to restoration, water efficiency and aquatic invasive species prevention projects. Given the proximity of project # 1 to Washoe Tribal land, a representative from the Washoe Environmental Protection Department (WEPD) serves on a Technical Advisory Committee and attends partnership meetings in order to identify opportunities for collaboration. The WEPD Director has expressed interest in incorporating heritage protection signage at the proposed restoration site for Project #1. Implementing project # 4 will greatly benefit the Washoe Tribe of Nevada & California and the residents of the Tribe's Woodfords Community. Specifically, the comprehensive water conservation program will optimize the water savings and improvement in the sustainability of the Woodfords Community infrastructure, sewer treatment capacity, and water quality and water quantity in the aquifer will sustain the Community for years to come. The Tribe, through the WEPD will be in a better position to access addition funding as will be needed as completed projects generally give credibility and are accomplishments for the betterment of the entire Tribe. Project #5 will partner directly with the Washoe Tribe in the development of a regional outreach committee to identify opportunities for shared resources and collaboration in the prevention of aquatic invasive species introductions into tribal waters.

**Ensure Equitable Distribution of Benefits:** All projects planned and implemented in the areas identified as a disadvantaged community (Nos. 4, 6, 7, and 9) will include outreach targeted to historically underserved populations to attempt to engage them in the stakeholder process. Appropriate avenues of communication will be utilized (e.g. bilingual public notices and outreach materials in Spanish speaking neighborhoods). One of the projects listed above (Nos. 4) will be implemented entirely within a disadvantaged community. An additional three projects (Nos. 6, 7 and 9) will implement a portion of the project components within disadvantaged communities. The water supply and water quality projects implemented within disadvantaged communities will serve to ensure adequate drinking water for populations located within disadvantaged communities. In addition project implementation will result in a reduction of pollutants entering into the water supply system and will help to improve the quality of life for community members within these targeted areas. Additionally, projects #1 and #5 will increase collaboration and partnership with residents in disadvantaged communities through participation in the restoration of tribal land (project #1) and the broad benefit to all communities and users through water quality protection from the prevention of aquatic invasive species (project #5).