

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION**

**MEETING OF MAY 13-14, 2015
SOUTH LAKE TAHOE**

ITEM: 9

SUBJECT: **STATUS REPORT ON CLIMATE CHANGE ADAPTATION
WORKSHOPS**

**CHRON-
OLOGY:** November 13, 2014, and January 15, 2015 – Lahontan Water Board held public workshops in Barstow and South Lake Tahoe to gather input from stakeholders on ideas the Board should implement to adapt to climate change.

ISSUE: What actions, if any, should the Water Board recommend to staff, the State Water Board, or other entities to adapt to climate change?

**BACK-
GROUND:** Dan Cayan, PhD, and Michael Dettinger, PhD, both of the Scripps Institution of Oceanography and USGS, presented the latest research on climate change effects in the Lahontan Region at the November 2014 and January 2015 climate change workshops. Drs. Cayan and Dettinger concluded that climate change in the Lahontan Region will produce less snow in the mountains, generate larger floods, warm the surface waters, extend dry spells for longer periods, and potentially store less water in reservoirs and groundwater.

For the expected changes, the Lahontan Water Board has many existing policies and tools in place it can use for climate change adaptation, such as adoption of plans and policies, issuance and enforcement of permits, region-wide ambient monitoring of surface waters, encouragement of watershed restoration, water conservation and recycling, salt and nutrient management planning, and promotion of low-impact development principles. However, the Water Board lacks an action plan to meet the specific needs of the region, and the public workshops generated several key ideas the Water Board could implement for climate change adaptation.

**IDEAS FROM
WORKSHOPS:** Small group brainstorm sessions at the climate change workshops, which involved more than 100 stakeholders collectively, generated roughly 400 ideas for the Water Board to consider. The notes from the small group brainstorm sessions were compiled in Enclosure 2

The many suggestions can be grouped under four main themes:

1. Protecting resources and providing resiliency
2. Improving water supply and water quality
3. Communicating, collaborating, and streamlining processes
4. Other considerations and opportunities

Enclosure 1 is a matrix of the ideas from the workshop organized by the four themes with a description of the existing tool or action relative to each specific suggestion.

**OTHER
REGIONS:**

Region 3 (Central Coast) adopted requirements in 2013 for municipalities to meet storm water post-construction performance standards for development projects. These performance requirements included LID or its equivalent as one of many minimum performance standards, and it augments the State Board's Phase II General Municipal Stormwater Permit. Region 3's order and the attached requirements can also be downloaded from http://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.shtml

Region 8 (Santa Ana) presented an informational item at its October 2014 Board meeting about impacts of the drought on water quality in the region. Major public water agencies within the region were invited to speak and highlighted specific impacts:

- Groundwater levels are at an all-time low
- Reduced supply from the State Water Project necessitated increased use of Colorado River water which has high salinity
- Increased challenge to meet wasteload allocations from high salinity of imported water
- Increased challenge to meet TDS limits in recycled water permits

All water agencies at the Region 8 meeting asked if the Basin Plan objectives and/or permit limitations were to be revised to reflect the increase in salinity of source water. The Region 8 Executive Officer noted this agenda item was intended to bring awareness about the drought impacts and concerns over water quality and permit compliance.

Region 5 (Central Valley) held a climate change workshop on March 12, 2015, at the CalEPA building in Sacramento. Region 5 divided the workshop into several different panel discussions where the public was invited to ask questions of the individual panelists. The agenda can be

found at
http://www.waterboards.ca.gov/centralvalley/board_info/meetings/1503_ag_climate.pdf and the video of the workshop is available at
<https://www.youtube.com/watch?v=Kda7OS6DV0I&feature=youtu.be>

EXISTING TOOLS AND ACTIONS:

The Water Board has many existing policies, regulations, and adopted permits that directly or indirectly address climate change. Some of these existing tools and actions are briefly listed in the matrix shown in Enclosure 1. These tools and actions include policy statements, adopted regulations or permit requirements, or other actions such as collaborations and encouragement. Though many of the existing tools or actions do not explicitly mention climate change, the described control measures and considerations can be applied to address climate change effects. Excerpts of relevant policy statements from the Lahontan Basin Plan are in Enclosure 3.

The following descriptions provide more detail on the existing tools or actions, some of which are briefly listed in the matrix of Enclosure 1:

Lake Tahoe/Truckee Watersheds

The Basin Plan contains regulations that directly address climate change effects. Chapter 4.1 prohibits disturbance in 100-year floodplain of Truckee River hydrologic unit. Chapter 5.2 prohibits disturbance in stream environment zones and in 100-year floodplains of the Lake Tahoe hydrologic unit. Chapter 5.18 (Lake Tahoe TMDL) specifically addressed climate change:

The Regional Board evaluated the anticipated changes in temperature and precipitation associated with global climate change. An extensive review of available literature and climate change model results concluded that by the year 2050, Lake Tahoe basin temperatures may increase by up to two degrees Celsius and average annual precipitation may decrease by approximately ten percent. This shift may influence local stormwater hydrology and stormwater dischargers may need to adjust future stormwater practices to ensure management measures are sufficient to meet the load reduction requirements described in Tables 5.18-2, 5.18-3, and 5.18-4.

The Water Board uses several regional and statewide adopted permits to regulate projects and activities. The Lake Tahoe Municipal NPDES Stormwater Permit specifies for new development and redevelopment projects that permittees shall require project proponents to incorporate permanent storm water treatment facilities that are designed to

infiltrate, at a minimum, runoff generated by the 20-year, 1-hour storm. The Lake Tahoe Construction Stormwater NPDES General Permit requires the project incorporate appropriate BMPs and LID techniques, as feasible, to infiltrate and/or treat the 20-year, 1-hour storm water runoff from existing and proposed impervious surfaces on the site as post-construction standards.

Storm Water Outside of Lake Tahoe

For construction activities outside of the Lake Tahoe basin, the Water Board uses the State Board's Construction Stormwater NPDES General Permit. This general permit does not explicitly require infiltration of storm water, but requires the project proponent to balance the water quantity and quality post-construction:

The discharger shall, through the use of non-structural and structural measures as described in Appendix 2, replicate the pre-project water balance (for this permit, defined as the volume of rainfall that ends up as runoff) for the smallest storms up to the 85th percentile storm event (or the smallest storm event that generates runoff, whichever is larger). Dischargers shall inform Regional Water Board staff at least 30 days prior to the use of any structural control measure used to comply with this requirement. Volume that cannot be addressed using nonstructural practices shall be captured in structural practices and approved by the Regional Water Board. When seeking Regional Board approval for the use of structural practices, dischargers shall document the infeasibility of using non-structural practices on the project site, or document that there will be fewer water quality impacts through the use of structural practices.

Recycled Water

The State Board adopted a Recycled Water Policy in 2009, updated and amended in 2013, to facilitate wastewater reuse. As part of the Policy, salt and nutrient management plans are being developed. The Water Board currently permits several wastewater entities to produce and use recycled water. The Water Board can also use the State Board's recently adopted General Permit for Landscape Uses of Municipal Recycled Water to facilitate water reuse and recharge-type activities.

State Proposition 1 "Water Bond": Water Quality, Supply, and Infrastructure Improvement Act of 2014 (AB 1471 Rendon)

Enclosure 4 is a one-page summary of how the more than \$7 billion in general obligation bond funds for the Proposition are allocated. The State Water Board was specifically named to administer several different groups of projects:

- \$260 million to the Small Community Grant Fund for public water system improvements; special provision of \$2.5 million matching funds for disadvantaged communities
- \$200 million for stormwater management projects
- \$625 million for water recycling and advanced treatment projects
- \$900 million for prevention/cleanup of contaminated groundwater that serves as a drinking water

Sustainable Groundwater Management Act of 2014

The California Legislature adopted the Sustainable Groundwater management Act (SGMA) in 2014, which provides a framework for sustainable management of groundwater by local authorities, with a limited role for State Board intervention only if necessary to protect the groundwater resource.

SGMA requires the formation of local groundwater sustainability agencies (GSAs) that must assess conditions in their local groundwater basins and adopt locally-based management plans. SGMA allows 20 years for GSAs to implement plans and achieve long-term groundwater sustainability. It protects existing surface water and groundwater rights and does not impact current drought response measures. SGMA is intended to ensure a reliable water supply for California.

The Department of Water Resources (DWR) has prioritized California's groundwater basins based on several factors, including population, population growth, irrigated acreage, and reliance on groundwater. GSAs for high- and medium-priority basins must form by June 30, 2017 or State Board may intervene. In areas where there are no jurisdictions by water districts or other potential GSAs, the county is expected to step in and become the GSA for those "potentially unmanaged areas" or PUMAs.

Lahontan has two high priority basins (Mojave and Antelope Valley). Both are exempt from SGMA because Mojave Basin is adjudicated and Antelope Valley Basin has made sufficient progress towards adjudication.

Governor's Executive Order B-30-15

California Governor Brown signed this executive order into effect on April 29, 2015, setting a lower target for greenhouse gas emissions and requiring these specific climate change adaption actions by state agencies:

- Incorporate climate change impacts into the state's Five-Year Infrastructure Plan (*Resources Agency*)
- Update the Safeguarding California Plan - the state climate adaptation strategy - to identify how climate change will affect California infrastructure and industry and what actions the state can take to reduce the risks posed by climate change (*Resources Agency*)
- Factor climate change into state agencies' planning and investment decisions (*all agencies*)
- Implement measures under existing agency and departmental authority to reduce greenhouse gas emissions (*all agencies as authority allows*)

Monitoring/Adaptive Management

As provided in the California Water Code, the Water Board has the authority to require monitoring related to assessing water quality effects from the discharge of waste or alteration of wetlands. Some of this monitoring can assist in detecting changes in water quality or quantity associated with climate change such as temperature, depth to groundwater, stream flow, and algae blooms.

The Water Board's Surface Water Ambient Monitoring Program (SWAMP) has four primary monitoring objectives for the Lahontan Region:

1. To determine whether ambient water quality at selected sites is in compliance with the water quality objectives contained in the Basin Plan and the "California Toxics Rule"
2. To determine whether water flowing from the Lahontan Region into the State of Nevada meets Nevada's water quality objectives
3. To develop and implement tools to assess the biological integrity of the Region's streams and rivers based on instream assemblages of benthic macroinvertebrates and algae (i.e., "bioassessment")
4. To collect data on fish tissue chemistry as needed by the California Office of Environmental Health Hazard Assessment (OEHHA) to develop fish consumption advice for specific water bodies.

Though the four SWAMP monitoring objectives do not currently mention climate change, the objectives are geared toward status and trend monitoring which can indirectly help inform about climate change effects.

CONCEPTUAL

MODEL: To develop a road map for climate change adaptation, Enclosure 5 is a draft conceptual model that summarizes the expected changes in precipitation and hydrology for our Region and links those changes to anticipated negative effects. The conceptual model links the existing tools the Water Board uses to address some of the negative effects.

KEY

QUESTIONS: At the workshop, Water Board staff will lead a brainstorming session with Board members to gather input on several key issues for developing and implementing a Lahontan Water Board Climate Change Action Plan. The following key questions will guide the brainstorming:

1. How should the Water Board address floodplains, wetlands, and critical recharge areas outside of the Tahoe/Truckee watersheds? What are the pros and cons of expanding the floodplain prohibitions to other areas of the Lahontan Region?
2. Should the Water Board expand LID and BMP requirements for NPDES Storm Water permits (similar to Region 3) as well as consider adopting general permits for areas outside of the Lake Tahoe basin and areas of our Region that do not contain waters of the United States?
3. Should the Water Board's other existing tools/actions be expanded or modified? For example, should the Water Board require wastewater agencies to identify vital infrastructure vulnerable to climate change (i.e., exposed sewer pipes in rivers)?
4. Should the Water Board modify its SWAMP objectives to specifically address climate change?
5. Should the Water Board develop and implement an adaptive management process for addressing climate change, and if so, what elements should it contain?
6. What recommendations should we provide to the State Water Board to consider on a statewide basis?

**RECOMMEN-
DATION:**

No formal action required, but the Water Board will be asked to provide direction to staff. Based on Water Board comments and direction, staff plans to draft a climate change action plan for public review and comment this summer 2015.

ENCLOSURE	ITEM	Bates Number
1	Matrix of Public Input and Existing Tool/Action	9-11
2	Compilation of notes from small group brainstorm sessions at the two climate change workshops	9-18
3	Excerpts from Lahontan Basin Plan	9-34
4	Proposition 1 Water Bond Allocations	9-53
5	Conceptual Model for Climate Change Adaptation	(to be provided under separate cover)

ENCLOSURE 1

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PUBLIC INPUT FROM WORKSHOPS		EXISTING TOOL/ACTION
1	Protecting Resources and Providing Resiliency	
1	<ul style="list-style-type: none"> Increase protection and restoration of floodplains and wetlands 	<ul style="list-style-type: none"> Basin Plan prohibitions in Chapters 4.2 and 5.2 on disturbance in 100-year floodplain for Truckee and Tahoe watersheds
1	<ul style="list-style-type: none"> Increase the required impact mitigation ratios (1.5:1) 	<ul style="list-style-type: none"> Exemption criteria to allow disturbance in prohibited areas of Tahoe and Truckee watershed requires 1.5:1 mitigation for certain projects For projects in federal wetlands (which are waters of the United States), federal Clean Water Act section 401 Water Quality Certification requires compensatory mitigation for unavoidable impacts but does not specify a minimum mitigation ratio
1	<ul style="list-style-type: none"> Adopt policies to protect critical groundwater recharge areas 	<ul style="list-style-type: none"> Basin Plan Chapter 4.6 (Ground Water Protection and Management) includes the policy statements describing the actions and authorities the Water Board can take to protect the ground water resources, which includes recharge areas Basin Plan prohibitions for discharge of waste from leaching or percolation systems and septic systems for certain areas Lahontan General Permit WDR for Land Disposal of Treated Groundwater Sustainable Groundwater Management Act of 2014 requires local agencies to assess condition and adopt management plans that protect water rights and water quality while ensuring a reliable water supply
1	<ul style="list-style-type: none"> Improve and protect water and waste water infrastructure from failure 	<ul style="list-style-type: none"> Basin Plan Chapter 4.4 (Municipal and Domestic Waste Water: Treatment, Disposal, and Reclamation) includes the policy statements describing the actions and authorities the Water board can take to protect the water quality but does not mention climate change and does not recommend actions for protecting infrastructure from climate change impacts State Board's Sanitary Sewer Overflow General Permit requires inspection, maintenance, and repair of sewage collection system
1	<ul style="list-style-type: none"> Expand monitoring and evaluation activities to continuously assess the effectiveness of water quality programs in building resiliency to extreme events and changing temperatures and precipitation 	<ul style="list-style-type: none"> SWAMP objectives do not specifically mention climate change, but are geared primarily toward status and trend monitoring which can help inform about climate change effects Discharger self-monitoring requirements may provide relevant information

	PUBLIC INPUT FROM WORKSHOPS	EXISTING TOOL/ACTION
2	Improving Water Supply & Water Quality	
2	<ul style="list-style-type: none"> • Capture and infiltrate stormwater 	<ul style="list-style-type: none"> ▪ Lake Tahoe Construction NPDES Stormwater General Permit, Lake Tahoe Municipal NPDES Storm Water Permit, Basin Plan Chapter 5.6 (Stormwater Problems and Control Measures), and Basin Plan Chapter 5.18 (Lake Tahoe TMDL) require capture and infiltration of 20-yr/1-hour storm volume for development and redevelopment projects in the Tahoe basin ▪ For areas outside of the Tahoe basin, Statewide Construction NPDES Storm Water Permit includes guidance, not a requirement, to use LID principles for controlling storm water.
2	<ul style="list-style-type: none"> • Increase water recycling 	<ul style="list-style-type: none"> ▪ Basin Plan Chapter 4.4 (Municipal and Domestic Wastewater) includes policy statements describing the Water Board’s existing authorities, actions, and objectives regarding wastewater recycling. This chapter highlights the need to develop water supply alternatives because of the increasing statewide water supply shortage. ▪ The State Board adopted a Recycled Water Policy in 2009 ▪ Lahontan Water Board adopted WDR permits for several wastewater facilities to allow wastewater recycling ▪ The Water Board can also use the State Board’s recently adopted General Permit for Landscape Uses of Municipal Recycled Water to facilitate water reuse and recharge-type activities.
2	<ul style="list-style-type: none"> • Provide incentives to conserve water and capture/use stormwater 	<ul style="list-style-type: none"> ▪ The State Water Board adopted a General Permit in 2012 to allow aquifer storage and recovery projects that inject drinking water into groundwater. This permit will improve statewide water management by increasing local storage to be responsive to the needs of local communities and environmental resources ▪ Basin Plan Chapter 4.3 (Stormwater, Erosion, and Sedimentation) describes stormwater as a potential pollution source but does not discuss stormwater as a potential resource ▪ Basin Plan Chapter 4.8 (Land Development) contains guidelines for capturing and infiltrating stormwater to protect water quality but does not mention water conservation measures or objectives to use stormwater as a resource ▪ Basin Plan Chapter 4.9 describes the control measures the Water Board could implement to prevent or mitigate water quality problems related to water quantity, but does not provide incentives to conserve water or capture/use stormwater as a resource

	PUBLIC INPUT FROM WORKSHOPS	EXISTING TOOL/ACTION
2	<ul style="list-style-type: none"> Prioritize recharge over groundwater extraction 	<ul style="list-style-type: none"> Basin Plan Chapter 4.6 (Ground Water Protection and Management) describes the actions and authorities the Water Board can take to protect the ground water resources from overdraft, but does not explicitly prioritize recharge over groundwater extraction.
2	<ul style="list-style-type: none"> Require implementation of Low-Impact Development (LID) principles 	<ul style="list-style-type: none"> The Lake Tahoe Construction NPDES Stormwater General Permit requires implementation of LID principles for post-construction of projects in the Tahoe basin For areas outside of the Tahoe basin, Statewide Construction NPDES Storm Water Permit includes guidance, not a requirement, to use LID principles for controlling storm water.
2	<ul style="list-style-type: none"> Encourage using pervious pavement and other BMPs to capture and infiltrate water 	<ul style="list-style-type: none"> Basin Plan Chapter 5.6 (Stormwater Problems and Control Measures) and Chapter 4.3 (Stormwater, Erosion, and Sedimentation) include guidelines for capturing and infiltrating water, but do not specifically mention pervious pavement
2	<ul style="list-style-type: none"> Allow dual plumbing that uses grey water for irrigation and infiltration 	<ul style="list-style-type: none"> Basin Plan Chapter 5.2 (Lake Tahoe Discharge Prohibitions) specifically prohibits discharge of all liquid waste and requires all wastewater to be put into a sewer system, which includes grey water, to be exported out of the Lake Tahoe basin. This requirement is directly from the Porter-Cologne Act of 1970. For areas outside of the Tahoe basin, Basin Plan Chapter 4.4 (Municipal and Domestic Wastewater) states that under certain circumstances, grey water systems may be an acceptable method of disposal in conjunction with a composting toilet or holding tank to handle black water. Examples of appropriate applications include recreational areas such as campgrounds, day use facilities, and trailheads.
2	<ul style="list-style-type: none"> At Lake Tahoe, continue implementing the TMDL and its adaptive management system 	<ul style="list-style-type: none"> At its March 2015 meeting, the Water Board stated that one of its priorities to protect aquatic resources and surface water quality is to fully implement and track all its adopted TMDLs, including the Lake Tahoe TMDL. The Water Board has dedicated one staff member's sole responsibility to implement the Lake Tahoe TMDL, including its adaptive management system

	PUBLIC INPUT FROM WORKSHOPS	EXISTING TOOL/ACTION
3	Communicating, Collaborating, and Streamlining Processes	
3	<ul style="list-style-type: none"> Present more public workshops to reach out and inform stakeholders about actions that private citizens and public agencies can implement for climate change adaptation 	
3	<ul style="list-style-type: none"> Ensure disadvantaged communities are invited and represented in discussions 	<ul style="list-style-type: none"> The Water Board issued a January 2015 report on environmental justice (EJ) in the Lahontan region and listed recommendations including dedicating a Water Board staff as EJ liaison, training staff in EJ issues, dedicating funds to assist disadvantaged communities directly or through other agencies
3	<ul style="list-style-type: none"> Coordinate with all responsible agencies and foster collaboration, including maximizing efficiencies in using monitoring budgets 	<ul style="list-style-type: none"> Water Board staff coordinates at least monthly with the Tahoe Regional Planning Agency, Nevada Division of Environmental Protection, US Geological Survey, University of Nevada at Reno, California Tahoe Conservancy, and the UC Davis Tahoe Environmental Research Center on monitoring of mid-lake, tributaries, and nearshore of Lake Tahoe The State of Nevada coordinated with California agencies on the monitoring of the Truckee River
3	<ul style="list-style-type: none"> Promote and prioritize grant funding for projects adapting to climate change 	<ul style="list-style-type: none"> Proposition 1 (Water Bond) of 2014 allocated about \$2 billion in general obligation bonds to the State Water Board to fund various projects, including water system improvements for disadvantaged communities, water recycling, cleanup of contaminated groundwater where needed for drinking supply, and stormwater management California Legislature (SB 445) authorized funds from the Underground Storage Tank (UST) Cleanup Fund to be used for cleanup of non-petroleum contaminated groundwater supplies
3	<ul style="list-style-type: none"> Reduce permit requirements to essential information and streamline processing 	<ul style="list-style-type: none"> The Water Board updated its region-wide Timber Waiver in 2014 by streamlining the permitting processes, maximizing monitoring efficiencies, and changing the requirements from prescriptive to performance-based The State Water Board adopted a resolution in 2013 that specified actions it would take to reduce the costs of compliance for stakeholders while maintaining water quality. Actions included reviewing required monitoring, reporting, and permit fees for possible reductions. State Board staff are to report to the State Board every six months on progress

	PUBLIC INPUT FROM WORKSHOPS	EXISTING TOOL/ACTION
3	<ul style="list-style-type: none"> Work with the Division of Drinking Water to evaluate water quality in public water supplies, including investigating sources of pollution 	<ul style="list-style-type: none"> The State Water Board is working on improvements in its Groundwater Ambient Monitoring & Assessment Program and coordinating with the Division of Drinking Water
4	Other Considerations & Opportunities	
4	<ul style="list-style-type: none"> Evaluate effects of proposed projects on cumulative watershed scale and water supply 	<ul style="list-style-type: none"> As either a lead or responsible agency under CEQA, Water Board staff review project proposals and evaluates effects on a cumulative watershed basis
4	<ul style="list-style-type: none"> Strengthen the enforcement program 	
4	<ul style="list-style-type: none"> Develop a transparent, adaptive management process to consider new information and make adjustments in regulations or policies as related to climate change 	
4	<ul style="list-style-type: none"> Promote sustainability at all levels. Consider all Water Board decisions in a broader context related to reducing emissions and preserving resources 	

ENCLOSURE 2

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SMALL GROUP BRAINSTORM

a) List policies and tools including changes to organizations and applicable law the Water Board should have to address climate change by year 2040. Identify top 3-5 ideas
1. Partner and facilitating better watershed/forest management with the pace and scale with changes in climate.
2. Protecting wetlands/meadows <u>increase</u> mitigation ratios and additional funding.
3. TMDL consider adapting to new information.
4. Streamlining policies, procedures aligning with partners' goals.
5. Stop exporting wastewater out of basin.
b) Key steps to get the Water Board from current state to desired state in 2040
<ul style="list-style-type: none"> • Reuse tertiary treated waste water in basin careful use • Emergency response plan – floodplain management • Carbon grants – for cap/trade funding for #1 and #2 above (forest management) • Better communicating value of Lahontan Upper Watershed to downstream users • Increase water restrictions/raise rates

Notecard (written from an external source)
1. Forest Management
<ul style="list-style-type: none"> • Partner and facilitate better forest management that keeps up with pace and scale of changing climate • Take advantage of cap and trade funding
2. Wetland Restoration
<ul style="list-style-type: none"> • Protect/restore wetlands. Bring funding to region for large-scale projects. Increase mitigation ratios
3. TMDL – must adapt to new information
<ul style="list-style-type: none"> • Streamline policies and procedures to be more flexible, adapt to changes. • Align with other partner goals and plans.
4. Groundwater/Recycling
<ul style="list-style-type: none"> • Stop exporting wastewater outside Basin • Reuse tertiary treated water in Basin (carefully)
5. Develop emergency response plan/floodplain management plan
6. Better communicate value of upper watershed to downstream users – economic value of ecosystem services.
7. Increase water restrictions-raise rates
8. Biomass plant-promote utilization of local resources for energy and lumber
<ul style="list-style-type: none"> • Better education/outreach

SMALL GROUP BRAINSTORM

a) List policies and tools including changes to organizations and applicable law the Water Board should have to address climate change by year 2040. Identify top 3-5 ideas
<ul style="list-style-type: none"> ▪ Conservation – recycling, use efficiency decrease/limit demand, rates ▪ Forest management – credit for floods plain management streamline permit ▪ Coordinates with other entities ▪ Land use ▪ Flood plain restoration and management
b) Key steps to get the Water Board from current state to desired state in 2040
Incentify – funding, credits, streamline permitting. Identify funding sources
Education – Outreach - broaden message
Coordination – with other agencies
Stronger – Enforcement
Streamline permit the promote projects
Economies
Watersheds
Waste Water Bond – water use efficiency, recycling, conservation, coordination, gray water – recycling
<ul style="list-style-type: none"> • Conservation, planning
Water metering – laws and coordinate and rates
Forest management – credit for flood plain management thing and streamline and (?) incentive
Condition over the entire watershed including the portions in NV.
1. Watershed protection – forestry management coordination w/agencies entities
2. Conservation
Decrease/limit demand

SMALL GROUP BRAINSTORM

Groups 11/12

a) List policies and tools including changes to organizations and applicable law the Water Board should have to address climate change by year 2040. Identify top 3-5 ideas
1. Regional Boards good vehicle for having authority over water resource. More active role in setting water quantity → how and where it's used.
2. Expand our floodplain protection range outside of Lake Tahoe + Truckee; incentivize projects.
3. Bolster existing programs – BMP program, backyard conservation to focus on water reuse/conservation program → add gray water, LID.
4. 2040 Robust fully fund bioassessment for NRS projects to evaluate climate change.
5. Expand Invasive Species Policy - reach homeowners/boaters
b) Key steps to get the Water Board from current state to desired state in 2040
1. Identify locations where RB has more authority over water quantity. Run it up SB → Cal EPA → have legislatures sponsor it → realign water quantity authority to mor local level. Streamlined project review permitting for projects that tackle climate change build in exemptions to ease project implementation.
2. Basin Plan Amendment Championed by RB to expand floodplain protection beyond LTBasin + Truckee Local Outreach to have local governments take on enforcement.
3. Relax on house-by-house gray water reuse. Expand re-use with careful eye on water quality protection. Re-use for snow making req.

SMALL GROUP BRAINSTORM

<p>a) List policies and tools including changes to organizations and applicable law the Water Board should have to address climate change by year 2040. Identify top 3-5 ideas</p>
<p>1. Give Regional Water Boards more authority over water quantity. Water Resource Management.</p>
<p>2. Expand our floodplain protection range outside of Lake Tahoe and Truckee. Incentivize projects.</p>
<p>3. Bolster existing BMP Program/backyard conservation to focus on water reuse/conservation gray water, LID</p>
<p>4. By 2040 have robust fully funded bioassessment to evaluate climate change</p>
<p>5. 5. RB Play more active role in Invasive Species Control.</p>
<p>6. Streamline permitting for projects that tackle climate change.</p>
<p>1. Expanding SB/RB authority SB/RB to develop project and take it to EPA-new legislation</p>
<p>2. Expand floodplain protection for the rest of the Lahontan Region (100 year floodplain) Basin Plan amendment – SB approval local outreach to encourage local governments to implement</p>
<p>3. Bolster existing programs to focus on water re-use (BMPs/LID/etc.) still protective of water quality</p>
<p>4. By 2040, fully funded program for bioassessment for NPS</p>
<p>5. Expand invasive species policy RB play a more active role in invasive species control – make it a bigger priority</p>
<p>6. Streamline regulatory requirements/permits for projects that address climate change Exemption.</p>

<p>Monitoring</p> <ul style="list-style-type: none"> • More focus on water quality bioassessment and less of chemistry for non-point source • A15 JD, Removal
<p>Watershed Protection</p> <ul style="list-style-type: none"> • Address water as a complete resource • Incentivize restoration
<p>Land Use</p> <ul style="list-style-type: none"> • Floodplain Expansion outside of Basin • Development pressures are limited in North Cal/Lahontan Basin
<p>Groundwater Reliability</p> <ul style="list-style-type: none"> • Expand Floodplain protection – recharge
<p>Infrastructure Protection</p>

Climate Change Adaption Planning Workshop Notes

A) List policies and tools including changes to organizations and applicable law the Water Board should have to address climate change by year 2040. Identify top 3-5 ideas	
1.	Mandated changes/tech improvements in agricultural operations muni (grass)
	<ul style="list-style-type: none"> • Turf grass ban (policy/tools) in Tahoe • Pervious Pavement
2.	Limit flood as irrigation & require soil conservation/enhancements
	<ul style="list-style-type: none"> • Expand and regulate biological pollution (aquatic invasive species) like we regulate water quality (sodium/nitrate) • More robust analysis of internal base loading as contributor to pollution – before other measures (pesticide) – nutrient loading • Infrastructure – No construction in flood plains (housing, bridges, roads), or low-impact design principles • Initiatives to move out of flood plains (New Orleans) • New constriction housing have grey water and black water separation of systems to encourage recycling (grey water recycling) • Ordinance should require/promote rainwater capture • Re-evaluate water quality standards, i.e., sediment load annual metrics (annual average concentration). • Re-evaluate the Lake Tahoe TMDL based on new and emerging science • Develop better understandings of near-shore pollution • Real time monitoring requirements across the region. • Support data shaving initiatives – broadly accessible and available integrated systems to scientists. • Partnerships – stronger partnerships with ARB – on atmospheric depositions • Begin focus on other sources (atmospheric dep, forestry) of pollution sooner that are caused by pollution from climate change • Require larger water/stormwater capture facilities • Strengthen stormwater capture requirements/LID requirements

Climate Change Adaption Planning Workshop Notes

B) Key steps to get the Water Board from current state to desired state in 2040	
1.	Res. Approach/tools needed to change to accommodate the world with more variety (laws, money, priorities, hoe to write permits)
2.	Adopt new policies/permits to require for landscaping use of BACT in water use efficiency.
3.	Change funding strategies to allow direct support for new science that is needed to inform policy development/management strategies (dedicated fund for science).
4.	Dedicated ongoing funding for an integrated database (SWAMP with air quality precipitation data)
5.	Expand role of regional board beyond traditional regulation to increased use of incentives. Develop more incentive policy.

Notes (Tables 1 and 5):

a) List policies and tools including changes to organizations and applicable law the Water Board should have to address climate change by year 2040. Identify top 3-5 ideas
1. Improving Decision-Making abilities
o Gathering Information/Interdisciplinary Interagencies(?) Adaptive Mgt
o (reduce ? of uncertainty)
2. Education/Demonstration In Projects
o Garden
o Efficient irrigation
o Technology
o Leaking pipes
3. Providing grants/incentives
o Prioritize grants-for adaptive strategies
4. Incorporate water supply issues for managing irrigation
5. Foster interagency/interdisciplinary discussions
b) Key steps to get the Water Board from current state to desired state in 2040
1. Support a process-prepare for future to check model/data/verify adjust
2. what is best for Regan Beach – as a case study
3. Self-audit-adjust prioritize *evaluate our policies to see if they have unintended (?)
Consequence
Change policies to make sure WB isn't contributing to climate change
4. Support re-use and graywater (change Porter-Cologne change in legislation)

Flip Chart Notes **Table 1 and 5**

<u>Policies/tools</u>
Create policies to foster interagency discussion (via expedited permits)
Incorporate adaptive management
Self audit of what info we gather
Modeling and validate models with monitoring to reduce (manage) cone of uncertainty – adaptive management
Allow grey water use for household irrigation in Tahoe basin
Integrate climate change into BPs SRF, IRWM plans, & all planning aspects
Evaluate existing policies to ensure we are not contributing to climate change
Incorporate water supply issues for irrigating lands
<u>Steps</u>
Manage integrated approach to beach development and use
Promote infrastructure improvements/technology to reduce water loss and prioritize upgrades
Interagency coordination, partnership, data sharing
Foster interagency discussion at key times
Expand variety of info to make informed decisions as a part of the normal process
Prioritize grants to store water
Include water storage (adaptation) in permits
Adapt crops and irrigation technology to address limited water supply
Water/wetland buffer for ag return water to restore gw supply
Public education
Provide incentives to limit water use (ex: fund recycling or water reduc.)
Fund demonstration gardens
Demonstration proj: new techn, irrig. BMPs
Money to fund infrastructure
Leverage monitoring budget to incorporate climate change issues, leverage w/other organizations

Flip Chart Notes

A. List policies and tools including changes to organizations and applicable law the Water Board should have to address climate change by year 2040. Identify top 3-5 ideas
<ul style="list-style-type: none"> • Keep treated waste water in the basin • Better integration of water management agencies <ul style="list-style-type: none"> ○ Coordinated efforts ○ Synergistic • Incentivize water conservation • State/local funding sources for stormwater management and watershed restoration • Water Board drive adaptive management in the face of changing climate • Do the existing water quality standards make sense? Will they in 2040? What is baseline?
B Key steps to get the Water Board from current state to desired state in 2040
<ul style="list-style-type: none"> • Funding – state/local water boards science/monitoring/local assistance • Tahoe TMDL update adaptive management process • Stormwater decision standards are resilient and continuous examination of standards • Streamline/update Forest Management Permit (Timber Waiver) • Address regulatory redundancies (?) • Update MOUs • Clear roles and responsibilities • Use attainability analysis <ul style="list-style-type: none"> ○ Are the current standards attainable? • 5 year review data requirements? • Prioritized monitoring <ul style="list-style-type: none"> ○ Support use attainability anal • Modeling • Data management <ul style="list-style-type: none"> ○ Infrastructure ○ Colab interagency status reporting
List of policies and tool including changes to organization and applicable law the Water Board should have to address climate change by year 2040. Identify top 3-5 ideas.
1. The ability to change plans and policy easily and quickly.
<ul style="list-style-type: none"> a. Streamline policy process to accommodate new or unknown natural causes, to include the ability to relax from non-anthropogenic sources of pollution. b. Be able to change Basin Plan to accommodate non-anthropogenic source of pollution. c. CEQA process streamline it.
2. Economic Value of Water - tool
<ul style="list-style-type: none"> a. Determine or make standardization of the economic value of the different water quality features, i.e. the economic value of a wetland vs economic value of a created wetland with respect to water quality. This tool could have numerous uses from enforcement to evaluating proposed projects.
3. Provide the Regional Boards the ability to make some water rights decisions
<ul style="list-style-type: none"> a. There are instance were the removal of water and or diversion of water has significant effects on a water way. The Regional Boards have little authority on those issues.
4. Increased Coordination and Partnership with other agencies. The concept here is to coordinate with agencies who may not have jurisdiction on water quality, but have impact on water quality, such as land planning, and air quality
<ul style="list-style-type: none"> a. An example, atmospheric deposition of nitrogen and being able to compete for grants from the Air Board to ameliorate some effect of atmospheric deposition of nitrogen attributed to emissions. b. Be able to work with land planning agency and require Low Impact Development (LID) and minimize flood zone developments.

Summary of Comments from Table 3

Topic I – Infrastructure and regulations
Extreme events (e.g., floods)
Sewer lines are in stream ways
Flashy events are a problem
Replace old sewer lines
Consequently, Water Board should re-examine the 100-year floodplain in our regulations
Longer spans for culverts
Examine spillways and dams at Tahoe
Topic II (US Forest Service considerations related to climate change)
Better drinking water, but sacrifices:
1. Species diversity, but less water
2. Tree thinning
Tell the public what to gain and what to lose
Decision assumptions made in previous years (for the following three issues) must change due to climate change:
1. Habitat
2. Species diversity
3. Species refuge
The Forest Service uses a 20-30 year planning horizon
What if only one stream to protect Lahontan cutthroat trout?
Climate change will cause dislocations for certain species
Remaining species and the moral and ethical assumptions to protect them
Messaging at the Forest Service:
Tree thinning means less trees but more water (e.g., thinning means less ET loss, less wildfire)
Increase the survey of white bark pines (?)
Topic III (public education)
Challenge the fundamental assumptions (e.g., will we always have water?)
Filtration exemption at Tahoe should be emphasized as a “success” to protect
Cultural shift needed
LTCC as a forum to engage
What role can LTCC play? (Convening, education, facilitating?)
Communicate what we are doing, but do not make it too technical. Serve a wider audience.
Get more involved, not just for visitors, it’s your backyard
Buy-in for consumers
“Use Tahoe as a California classroom”

Brainstorm Group Notes - November 13, 2014

Group 1
a. List policies, tools and authorities the Water Board has to address climate change by year 2014.
1) Streamline RWQCB processes – <ul style="list-style-type: none"> • Reduce requirements for only essential items.
2) Encourage climate change related projects
3) Reduce conflicting regulations <ul style="list-style-type: none"> • Insuring no conflict with other agencies.
4) Maximize resources within your community. <ul style="list-style-type: none"> • Groundwater management, recycled water etc.
5) Don't issue time schedule orders unless funding identified.
b. Key steps to get the Water Board from current state to desired state in 2040.
1) Develop and adopt more region wide general permits
2) Train field staff to provide guidance and resolve issues at lowest level.
3) Water Board staff to advocate for funding of orders that impact small agencies.

Group 2
a. List policies, tools and authorities the Water Board has to address climate change by year 2014.
1) Pollution Prevention Policies – <ul style="list-style-type: none"> • Identify other vulnerable areas/communities. • Low impact development. • Focused fuel reduction. • Flood plan construction limits.
2) Consider Groundwater Contaminated Waters as Resource – <ul style="list-style-type: none"> • Look at new technologies. • Speed up clean up times. • Consider plume movement from over pumping.
3) Re-class WWTP as Resource Recovery Plants – <ul style="list-style-type: none"> • Use recycled water more effectively. • Adapt treatment plants to be energy producers (bio) and help divert organics from landfills.
4) Additional Notes – <ul style="list-style-type: none"> • Expanding monitoring to inform decision. • Outreach and collaboration with other entities to maximize utilization of resources. • Use existing collaborative teams (like RWMGs) to further mission. • Applicable to all but focus on prevention and groundwater as resource.
b. Key steps to get the Water Board from current state to desired state in 2040.
1) Re-examine our existing tools, permits and practices to encourage/incentive new pollution prevention policies – expand monitoring and partner.
2) Adopt policies/practices/BAT
3) Work with WWTP facilities to identify improvements, help with funding, support creative solutions.
4) Additional Notes – <ul style="list-style-type: none"> • Continued or expanded presence of local entities and in local communities to build trust and solicit ideas and recommendations and act upon them and update those communities on actions. • Applicable to all (overall direction of any agency to get communities involved.)

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Group 3
a. List policies, tools and authorities the Water Board has to address climate change by year 2040.
1) Increase/enhance infiltration/protect areas.
2) Increase water recycling.
3) Modify CEQA.
4) Replace Infrastructure/Protect Infrastructure.
b. Key steps to get the Water Board from current state to desired state 2040.
1) Evaluate/refocus on SW MGT program to emphasize protection of infiltration and remove aspects that don't apply.
2) Share info/Provide Assistance for Grants and Loans to increase water recycling/recharge.
3) Protect areas of infiltration, limit development.
4) Promote changes to CEQA to facilitate infrastructure improvement/protection and GW recharge.
5) Ideas prepared by Jay Cass – <ul style="list-style-type: none"> • Storm water retention and recharge. • Infrastructure Replacement. • Earthquake/Flood infrastructure. • High Desert – Brine Lines (2) for export of salinity and disposal. • Decentralized Solar Systems and eliminate large, intrusive central systems that degenerate fragile desert ecosystems. • Establish total N effluent limit. • Low impact development targeted to High Desert needs.

Group 4
a. List policies, tools and authorities the Water Board has to address climate change by year 2040.
1) Policies that are locale specific (North vs South Lahontan) and flexible.
2) Revamp NPDES regulations – <ul style="list-style-type: none"> • BMP's that drain resources and have no beneficial results. • Use runoff as recharger not "waste." • Region specific.
3) Protection of sensitive recharge areas and watersheds (i.e. damage caused by OHV.)
b. Key steps to get the Water Board from current state to desired state 2040.
1) Legislation that enables Water Board to accomplish items listed above.
2) Clear vision from Board as to what we are trying to accomplish.
3) Rationalized funding.
4) Re-define/Refine philosophy of Board towards empowered action.
5) Collaboration with other enforcement entities – i.e. law enforcement, code enforcement, forest service; and Fish and Game.

Group 5
a. List policies, tools and authorities the Water Board has to address climate change by year 2040.
1) What authority/obligation does the WQB have to regulate water uses on private land?
2) Prioritize use of salty (recycled) water for renewable energy projects.
b. Key steps to get the Water Board from current state to desired state 2040.
1) Undescribed impact from GW pumping even if not in overdraft (springs, creeks.)

2) What benefits can Lahontan provide cities and counties?

Group 6	
a.	List policies, tools and authorities the Water Board has to address climate change by year 2040.
1)	Recharge/Reuse
2)	DACs water supply, water quality, and infrastructure – storm water treatment.
3)	Public Ed./Policy Educating
b. Key steps to get the Water Board from current state to desired state 2040.	
1)	Permit Streamline – <ul style="list-style-type: none"> • Attracting Financial Assistance – grant writing. • Helping establish distribution network. • Help create an overall vision prioritizing re-use of water for recharge and reuse. Give value to small projects – smaller scale does not equal need.
2)	Permit Facilitation for DAC projects – streamlining – <ul style="list-style-type: none"> • Communication between DACs and people with money • Encourage holistic crew of water management.
3)	Encouraging more program advantage for DACs – <ul style="list-style-type: none"> • Small system organizing and MWA • Work with Cal Rural Water – technical assistance.
4)	Direct contract with public – especially in schools – recycled water is ok. - Policy makers-constituent input: water board conduct from local to state to emphasize that one size doesn't fit all; regional people have knowledge and expertise; get local story before policy makers

Group 7	
a.	List policies, tools and authorities the Water Board has to address climate change by year 2040.
1)	Better recharge-floodplain-vegetation land use planning.
2)	Stabilize soil – farming area – dust programs for volunteers – develop more drainage areas – protect.
3)	Take advantage of floods, nuisance water, import, etc.
4)	Facilitating recharge – basin combined to recharge areas. <ul style="list-style-type: none"> • Less regulation – more collaboration. Planning more workshops to find out info that exists.
b. Key steps to get the Water Board from current state to desired state 2040.	
1)	Adaptive management, re-evaluation zoning to set aside sensitive area detention – local agencies can base local rule on state rules, state not regulate. <ul style="list-style-type: none"> • Retention, ag. Storage. • Studies – monitoring to show impacts/results
2)	Problem solving – <ul style="list-style-type: none"> • Funding water user groups/development fees • Incentives for easements for flood/recharge – use mitigation projects. • Climate stations so can match up cause/effects • SLB priorities fire/erosion protect head waters – recharge • Look for multiple benefits from projects already being implemented.

Group 8	
a.	List policies, tools and authorities the Water Board has to address climate change by year 2040.
1)	Grant funding

2) Time schedule orders
3) Water bond 2014
4) Recycled Water Policy – • Salt nutrient water quality.
5) Loss of Wetland
6) Low impact development.
b. Key steps to get the Water Board from current state to desired state 2040.
1) Aquifer recharge • WWTP 2 nd /tertiary treated water. • Storm water capture. • Purchase available water thru grants.
2) Conservation • Public education to change water re-uses perceptions. • “ “ for coming climate changes
3) Agency collaboration/Action • Incentivize programs such as dual plumbing. • Flood plan development limits. • Merge ground water withdrawals where appropriate.

Group 9
a. List policies, tools and authorities the Water Board has to address climate change by year 2040.
1) Water harvesting consideration in WB regs.
2) Remediation = ground water mining without recharge.
3) Balance current economics – value of water may increase in future; can’t write off cleanup due to expense.
4) Need more ways to deal with environmental compliance (CEQA exemptions, speed up timeline to deal with issues before emergencies happen.
5) Timeframe for infrastructure upgrade – mandate compliance in shorter time frames.
6) SNMP, require assimilative cap. Studies.
b. Key steps to get the Water Board from current state to desired state 2040.
1) SB issue – think long term; mind set change. ABT understanding the future value of water sustainability and recharge. • Recharge instead of reserved (GW mining) projects.

Group 10
a. List policies, tools and authorities the Water Board has to address climate change by year 2040.
1) Encourage flood control/water
2) Evaluate project impacts – watershed • Feedback M and R – adaptive management.
3) Pumping = Recharge (max recharge.)
4) Coordinate with County re storm water facilities – storm intensity.
5) Cumulative impact solar wind/compost.
6) Financial impact – Integrate Agency Planning – • Greater emphasis innovative technologies/financial ranking projects.
7) More emphasis on watershed, less on projects.
8) Local public/private partnerships – groundwater quality
9) Anti-deg policy – trade-off between quality and quantity recharge.
10) Flood plan protection in Mojave.

11) Public education re what can do/resources available.
12) Wetland mitigation – increase ratio to 3/1.
13) Interagency planning/partnerships. <ul style="list-style-type: none"> • Financial – coordinate resources. • Focused grants. • Focus program \$ on right pots. • Outreach/Education.
14) Shift focus to cumulative/watershed scale. <ul style="list-style-type: none"> • Floodplain protection. • Wetland mitigation • Anti-deg • Sustainable pumping/recharge
b. Key steps to get the Water Board from current state to desired state 2040.
1) Streamline permitting with incentives for innovation.
2) Shift IRWM focus to water availability and quantity.

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ENCLOSURE 3

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4.4, Municipal and Domestic Wastewater: Treatment, Disposal, and Reclamation

(BOD/COD), total dissolved solids, suspended solids, total and fecal coliform bacteria, nitrate, total nitrogen, total phosphorus, methylene blue active substances (MBAS), and purgeable halocarbons and aromatics. Monitoring requirements will also include monitoring of the receiving water, including the underlying ground water. At a minimum, four monitoring wells will be required.

Wastewater Recycling

Parts of the Lahontan Region, like California in general, are experiencing an increasing water shortage. In the southern portions of the Lahontan Region, for instance, the Antelope Valley and the Mojave Ground Water Basins are possibly overdrafted due to increased pumping to meet the water demands of the growing Victor Valley, Lancaster and Palmdale areas. In light of this increasing statewide water shortage, development of water supply alternatives is important. For many uses, recycled wastewater is a viable alternative water supply and sales of recycled water can sometimes be used to offset the costs of treating wastewater. (The terms “recycled water” and “water recycling” are now used in the California Water Code in place of the formerly used terms “reclaimed water” and “water reclamation”.) Residential greywater use decreases residential water demand and is discussed below in “Individual Wastewater Treatment Systems.”

Recycled water has a wide variety of applications. The applications include agricultural irrigation, landscape irrigation (including highway landscape, parks and golf courses), impoundments for landscape, recreational and/or wildlife uses, wetland and wildlife enhancement, industrial processes (e.g., cooling water, process water, wash water, dust control), construction activities and ground water recharge.

Wastewater recycling is an important component of wastewater management in the Lahontan Region. As of 1994, a total of 17 wastewater recycling plants in the Lahontan Region accounted for 7% of all recycled water reuse in the State. In fact, the Los Angeles County Sanitation District No. 14 - Lancaster water recycling plant and the South Tahoe Public Utility District sewage treatment plant were among the top twelve major recycled water producers in the State. Other recycled water producers in the Region include the Susanville Consolidated Sanitary District, the Crestline Sanitation District, the Lake Arrowhead Community Services District, and the Ridgecrest/China Lake Naval Weapons Center wastewater treatment facility.

Recycled water in the Lahontan Region is used for golf course, alfalfa, tree and other agricultural irrigation, as well as for soil compaction and dust control. Some recycled water from the Lancaster Water Reclamation Plant is used for wildlife habitat enhancement at Piute Pond and to supply a recreational lake at Apollo Lake County Park. Other uses of recycled water, such as for snow making in areas of Lake Arrowhead and Mammoth Lakes, have been proposed to the Regional Board. (See Waste Discharge Prohibitions Section for Mojave River HU for exemption language concerning reclaimed wastewater.)

The State Board adopted the “Policy with Respect to Water Reclamation In California” and the related “Action Plan for Water Reclamation in California” in 1977 (State Board Resolution No. 77-1). This policy specifies actions to be implemented by the State and Regional Boards, as well as other agencies, in relation to reclaimed water use. The policy directs the State and Regional Boards to encourage reclamation and reuse of water, and to promote water reclamation projects which preserve, restore, or enhance instream beneficial uses. The policy also states that the State and Regional Boards recognize the need to protect public health and the environment in the implementation of reclamation projects.

The Porter-Cologne Act requires Regional Boards to consider the need to develop and use recycled water when establishing water quality objectives. The Porter-Cologne Act also requires the State Department of Health Services (DHS) to establish statewide recycling criteria for each type of recycled water use to protect public health. The Act requires any person proposing to discharge recycled water to file appropriate information related to the discharge with the Regional Board. The Act also states that, after consulting with and receiving recommendations from DHS, and after any necessary public hearing, the Regional Board shall, if necessary to protect the public health, safety or welfare, adopt water reclamation requirements for the recycled water discharge.

The California Water Code provides encouragement for the use of recycled water in relation to water rights decisions, as follows (Section 1010 [a][1]):

“The cessation of, or reduction in, the use of water under any existing right regardless of the basis of right, as the result of the use of recycled water, ... is deemed equivalent to and for purposes of maintaining any right shall be construed to constitute, a reasonable beneficial use of water to the extent and

Ch. 4, IMPLEMENTATION

in the amount that the recycled ... water is being used not exceeding however, the amount of such reduction.”

The Porter-Cologne Act (Section 13522[b]) provides that the use of reclaimed water pursuant to uniform statewide reclamation criteria “does not cause, constitute, or contribute to, any form of contamination” unless the Department of Health Services or the Regional Board determines that contamination exists.

The Porter-Cologne Act (Sections 13523.1 and 13263[h]) allows Regional Boards to issue master reclamation or recycling permits for suppliers and/or distributors of reclaimed or recycled water. Master reclamation permits must include waste discharge requirements and requirements for the following: compliance with statewide reclamation criteria, establishment and enforcement by the permittee of rules or regulations for reclaimed water users, quarterly reporting on reclaimed water use, and periodic compliance inspections of water users by the permittee.

The California Water Code (Sections 13550 through 13556) declares that use of potable water for certain purposes (e.g., irrigation of parks, golf courses, cemeteries, and residential landscaping, and toilet and urinal flushing in nonresidential structures) is a waste and unreasonable use of water if nonpotable water is available, under specific conditions. Section 13555.2 declares the Legislature's intent to encourage the design and construction of distribution systems for nonpotable water separate from those for potable water. Section 13556 allows water suppliers to acquire, store, provide, sell and deliver recycled water for any beneficial use if the water use is in accordance with state water recycling criteria and with Chapter 7 of the Water Code.

While the Regional Board supports the concept of water recycling, it must also consider potential impacts from recycling on ground and surface water quality. When reviewing proposed water recycling projects, the Regional Board carefully considers potential public health impacts from pathogens or conservative organic compounds, as well as the potential of the proposed project to create pollution or nuisance conditions. The Board also considers potential impacts on the quality and beneficial uses of any receiving surface or ground waters including the potential for eutrophication of surface waters due to nutrient loading from recycled water. Discharges of recycled water are prohibited in areas of the Lahontan Region where waste discharge prohibitions are in place, unless exemption criteria, where applicable,

can be met. The Water Code (Sections 13529.2 and 13529.4) includes provisions for reporting cleanup, and administrative civil liabilities for unauthorized discharges of recycled water which has been treated at secondary or tertiary levels.

Accumulation of minerals is a common potential impact to receiving waters from recycled water uses. Accumulation of minerals must be minimized to provide for protection of beneficial uses. A variety of techniques can be used. Where well controlled irrigation is practiced, nitrate problems can be controlled. Vegetative uptake will utilize soluble nitrates which would otherwise move into ground water under a percolation operation. Demineralization techniques or source control of total dissolved solids may be necessary in some areas where ground waters have been or may be degraded. Presence of excessive salinity, boron, or sodium in the effluent could be a basis for rejection of proposals to irrigate cropland with effluent. However, the Porter-Cologne Act allows issuance of water recycling requirements to a project which **only** violates salinity objectives.

Water Recycling Control Measures for Indian Creek Watershed

Recycled water from the South Tahoe Public Utility District (STPUD) is exported from the Lake Tahoe Basin to Alpine County, where it is used for irrigation. In order to protect the beneficial uses of the Indian Creek watershed, the Regional Board must regulate the use of recycled water for irrigation in coordination with regulation of other discharges such as septic systems, irrigation return flows from lands not irrigated with effluent, and stormwater from pasture lands and manure storage areas. (High nutrient and coliform bacteria levels measured in Indian Creek and the lower West Fork Carson River indicate that better management of animal wastes is desirable in these watersheds.) The amount of nutrients leaching into ground waters from areas irrigated with domestic wastewater effluent should be minimized.

The Regional Board should maintain stringent waste discharge requirements for the irrigation of agricultural lands with STPUD's effluent, and extensive monitoring should be done to ensure that public health is adequately protected.

Waste discharge requirements for ranchers irrigating with effluent must specify control measures at least as strict as the following:

- Irrigation efficiency must be at least 50% in all effluent discharge areas. Higher efficiencies should be mandated for specific areas to the

4.4, Municipal and Domestic Wastewater: Treatment, Disposal, and Reclamation

maximum practical extent, based on site limitations and the limitations of available technology.

- Application of effluent to agricultural lands must be prevented during the winter period when crops are not growing.
- Prohibition of discharge to surface waters of tailwaters from lands irrigated with effluent.
- Strict effluent limits for Total Coliform Organisms
- Provision for pre-discharge assessment of potential effluent disposal sites to determine the risks of ground water contamination.
- Buffer areas to prevent effluent disposal too close to wells and spray disposal too close to dwellings and traveled ways.
- Ground and surface water monitoring to assess impacts of irrigation return flows.

Facilities Discussion

Regional Wastewater Treatment Facilities

Victor Valley Wastewater Reclamation Authority

In the past, local wastewater disposal systems in the Victor Valley area were adequate to serve its scattered development. However, in the 1970s the intensity of development reached the level where continued independent use of these systems and individual disposal units did not afford effective area wide control of wastewater. Based on long-range economic and water quality benefits to the immediate or downstream area, treatment and disposal facilities in the Victor Valley area needed consolidation. The disposal of wastewater necessitated a coordinated approach in the use of local ground, surface, and imported water to form an integral part of a water resources management program that provides for salinity control.

The Regional Board implemented control actions in the 1970s which resulted in the completion of a regional treatment plant in 1981, which is owned and operated by the Victor Valley Wastewater Reclamation Authority (VWVRA).

The VWVRA Treatment Plant, which is located approximately five miles north of the City of Victorville and approximately one mile northeast of George Air Force Base, collects, treats, and disposes of domestic wastewater.

The VWVRA transports wastewater to the treatment plant by means of interceptor sewers from the City of Victorville, Spring Valley Lake (San Bernardino County Service Area No. 64), Apple Valley, Oro Grande (San Bernardino County Service Area No. 42), and Hesperia.

The VWVRA project and Regional Board control actions were also instrumental in the construction of sewer systems for the Apple Valley Desert Knolls, Basin Plan prohibition area, Apple Valley Village and Bear Valley Road area, which are currently served by the VWVRA treatment plant.

The original capacity of the VWVRA treatment facility was 4.8 million gallons per day (mgd). VWVRA has subsequently expanded the plant to 9.5 mgd. The plant currently treats and discharges an average of 7.0 mgd to the Mojave River.

The VWVRA treatment facility is designed to provide a level of treatment greater than standard secondary treatment for the discharge to the Mojave River and to provide standard secondary treatment for the discharge to percolation ponds. Treatment processes consist of screening, grit removal, primary sedimentation, flow equalization, biological treatment, using activated sludge, secondary sedimentation, secondary effluent percolation, coagulation, a combination of pressure and rapid sand filtration, and chlorination.

Tahoe-Truckee Sanitation Agency

The Tahoe-Truckee Sanitation Agency (TTSA) provides tertiary treatment for wastewater collected by the North Tahoe and Tahoe City Public Utility Districts in the Lake Tahoe Basin; and by the Alpine Springs and Squaw Valley County Water Districts, the Truckee Sanitary District, and Placer County Service Area 21 in the Truckee River watershed. Wastewater is carried from member districts by an interceptor pipeline which generally parallels the Truckee River. Export of domestic wastewater from the Lake Tahoe Basin is mandated by the Porter-Cologne Act. The high level of treatment provided by TTSA is necessary to protect instream beneficial uses of the Truckee River in California and municipal use of the River in the Reno-Sparks, Nevada area.

Ch. 4, IMPLEMENTATION

13304 of the Water Code. State Board Resolution No. 92-49 outlines the five basic elements of a site investigation. The Resolution requires that the Regional Board ensure that the discharger is aware of and considers minimum cleanup and abatement methods. (For further details, see Section 4.2, "Spills, Leaks, Complaint Investigations, and Cleanups.")

Ground Water Overdraft and Related Water Quality Problems

Ground water overdraft can affect water quality, particularly in terms of total dissolved solids and organic compounds. (See also "Water Quality/Quantity Issues; Water Export and Storage," in Section 4.9 of this Chapter for additional discussion of ground water problems.)

The Regional Board will consider issuance of waste discharge requirements for ground water recharge with imported water which is of lower quality than local ground water. The Regional Board will also consider issuance of waste discharge requirements for projects which would interfere with ground water recharge. The Regional Board will consider monitoring ground water extraction in contaminated basins to ensure that pumping patterns do not cause the migration of pollutants within the basins, causing contaminants to move to unpolluted areas of the basins.

Agricultural Activities

Irrigation practices, pesticide and fertilizer use, and confined animal operations can adversely impact the quality and beneficial uses of ground water. The Regional Board encourages the use of Best Management Practices to minimize water quality impacts from these activities.

The Regional Board participates in a statewide monitoring program for pesticides in ground water, as mandated by the Pesticide Contamination Prevention Act (AB 2021). When appropriate, the Regional Board also issues waste discharge requirements to regulate discharges of waste and/or wastewater from irrigated fields and operations such as confined animal facilities. (See "Agriculture" section, later in this Chapter, for further details.)

Stormwater Management

Infiltration of stormwater is a common treatment method (see Section 4.3, "Stormwater"). It allows removal of nutrients and some other constituents through physical filtration or adsorption, and through biological uptake by plant roots and soil microorganisms. However, in areas with high ground

water tables, infiltration may lead to ground water contamination by toxic metals, deicing salts, and/or organic compounds which are common in urban stormwater. In these cases pretreatment to remove toxic stormwater constituents before infiltration, or choice of an alternative treatment method may be necessary. Regional Board staff will review proposals for infiltration of stormwater on a case-by-case basis, and place appropriate conditions in waste discharge permits to ensure protection of ground water quality.

Regional Board staff is currently conducting a study to determine the effectiveness of infiltration trenches in the treatment of surface runoff and in the protection of ground water. Three infiltration trenches in South Lake Tahoe are being studied. Ground water up and down gradient of each trench, and soil moisture from varying depths is being collected and analyzed. Data will be evaluated to determine whether any pollutants are entering ground water via the trenches, and whether any reduction of pollutants in runoff is occurring as the runoff percolates from the bottom of the trenches to the ground water. Contingent on available funding, the Regional Board may continue the study over the next one to five years.

Federal Control Measures for Ground Water Protection and Management

1. A number of federal statutes (e.g., the Clean Water Act, the Resource Conservation and Recovery Act, the Safe Drinking Water Act, the Comprehensive Environmental Response, Compensation and Liability Act, and the Federal Insecticide, Fungicide, and Rodenticide Act) provide the U.S. Environmental Protection Agency (USEPA) with the authority to prevent and control sources of ground water contamination, as well as to clean up existing contamination. USEPA recognized that these authorities to protect ground water were fragmented among many different statutes and were largely undefined. As a result, in 1984, the USEPA adopted a Ground Water Protection Strategy to articulate the problem and USEPA's role in ground water protection. The Strategy provides a system for internal coordination as well as a strengthening of state programs (National Research Council 1986). Guidelines have been issued for USEPA decisions affecting ground water protection and cleanup. The guidelines include a three-tiered system for classification of ground water. Class I is a strict nondegradation category for irreplaceable

areas” are areas within the jurisdictional waters of the United States which are comprised of the following habitat types, as characterized by the U.S. Fish and Wildlife Service: Palustrine Emergent Wetland, Palustrine Scrub-Scrub Wetland, Palustrine Forested Wetland (Cowardin et al. 1979). U.S. Army Corps of Engineers Section 404 nationwide permits for discharges of dredge and fill materials are not certified, except under certain conditions, for discharges which will affect SAS sites (see also “Wetlands Protection” discussion later in this section). Parts of many waters of the Lahontan Region qualify for the SAS designation as wetlands, riffle and pool complexes, sanctuaries, refuges and riparian areas. The Regional Board considers SAS information when updating beneficial use designations for the Region's waters and when updating the Region's Geospatial Waterbody System (GeoWBS) database (see Chapter 7).

Research Natural Areas and Special Interest Areas

The U.S. Forest Service (USFS) uses the designation of Research Natural Area (RNA) to preserve a specific area as a representative sample of an ecological community, primarily for scientific and educational purposes. The USFS designation of Special Interest Areas (SIA) establishes areas to be managed for their unique and special features including botanical and other features. The Regional Board considers USFS RNA and SIA designations when updating beneficial use designations for the Region's waters, and when updating the Region's Geospatial Waterbody System (GeoWBS) database (see Chapter 7).

Areas of Critical Environmental Concern

The U.S. Bureau of Land Management uses the Area of Critical Environmental Concern (ACEC) designation for areas where special management is needed to protect and prevent irreparable damage to important resources including fish and wildlife resources, or other natural systems. The ACEC designation signifies that the area contains significant values or resources. The Regional Board considers BLM Areas of Critical Environmental Concern designations when updating beneficial use designations for the Region's waters, and when updating the Region's Geospatial Waterbody System (GeoWBS) database (see Chapter 7).

Water Quality/Quantity Issues; Water Export and Storage

Because much of the Lahontan Region is desert, water supplies are often limited under natural conditions. Diversions of water for human use have threatened or impaired other beneficial uses in several portions of the Region. Although the authority to issue and modify water rights licenses rests with the State Water Resources Control Board rather than with the Regional Board, the Regional Board can bring water quality problems related to water diversions to the State Board's attention, and request that solutions be considered.

Most surface water in the Lahontan Region has already been allocated through court adjudications, water rights licenses, or interstate agreements (a map illustrating all adjudicated basins in the State is available from the State Board, Division of Water Rights). The California-Nevada Interstate Water Compact was negotiated in the 1960s, approved by the states in the early 1970s, and partially ratified by Congress in 1990 as P.L. 101-618. This law allocates the surface and ground waters of the Carson River and Lake Tahoe/Truckee River watersheds between the two states. Management of reservoirs and flows of regulated streams in these watersheds is the responsibility of a federal watermaster.

Large amounts of water are exported from the Mono Lake and Owens River watersheds by the Los Angeles Department of Water and Power for municipal use in Southern California. Smaller amounts are exported to the American River and Feather River watersheds from the North Lahontan Basin. Some water is imported into the Lahontan Region via the California Aqueduct. Many natural lakes in the Region have been dammed to increase storage, and are operated as reservoirs; new reservoirs have also been constructed. (See the separate discussion of “Reservoir Management,” below.)

Diversions have totally or almost totally dewatered some lakes and streams in the Lahontan Region, impairing or precluding the attainment of aquatic beneficial uses (e.g., Owens Lake). Recent court decisions have required the rewatering of the Owens River Gorge and some Mono Lake tributaries. Where diversion is not total, lower flows, or changes in the timing of flows, can stress aquatic ecosystems through higher summer temperatures, greater winter ice formation, increases in the concentrations of pollutants, and other factors.

Ch. 4, IMPLEMENTATION

Temperature and flow variations can affect critical life stages of aquatic organisms, and can change the nature and rate of nutrient and mineral cycles. In some cases (e.g., Mono Lake), lower water levels can increase the vulnerability of water-dependent wildlife to predators. Low streamflows stress riparian vegetation. Water diversions can aggravate natural stresses on aquatic and wetland ecosystems which result from droughts. Low flows can affect the ability of dischargers to surface waters to ensure attainment of receiving water objectives downstream of the discharge. The magnitude and timing of stormwater flows affects the concentration of pollutants, and the “first flush” of concentrated pollutants which have accumulated on urban pavement during the dry season can be especially stressful to aquatic organisms (see the “Stormwater” section in this Chapter). Diversions from lakes and reservoirs used for boating can result in increased demands for dredging to facilitate access to marinas and piers, with consequent water quality impacts related to resuspension of sediment and contaminants. In some parts of California, removal of vegetation, or conversion of vegetation to a different community type, is being used to increase surface runoff to increase water supplies. Water quality impacts of such practices, in terms of increased erosion and sedimentation, and loss of riparian/wetland values, can be significant.

Most municipal and agricultural water supplies used within the Lahontan Region come from ground water, often from individual wells. Ground water diversions are likely to increase because of new federal regulations which increase treatment requirements for surface sources of drinking water. Severe ground water overdraft has occurred in portions of the Region ranging from Surprise Valley in Modoc County to the Antelope and Victor Valleys in the South Lahontan Basin. Ground water overdraft can affect beneficial uses of surface waters such as wetlands and springs, particularly in dry areas. It can concentrate trace chemicals, both naturally occurring salts and contaminants due to human activities. Overdraft can lead to land subsidence and surface soil cracking. Some soil types (fine grained silts and clays), once compacted, can never again hold as much water upon rewatering of the aquifer. Severe cracking has occurred at Edwards Air Force Base near Lancaster, leading to the concern that cracks extending to the water table may facilitate the entry of toxic substances into water supplies. Increased ground water pumping in overdrafted aquifers can draw pollutants toward wells. Improperly constructed or abandoned wells can also act as conduits for pollutants (see the discussion

of well standards in the “Ground Water” section of this Chapter). Imported water used for ground water recharge, if it is of naturally lower quality than local ground water, can be considered a discharge even if no new introduction of wastes into the environment is involved (Sawyer 1988). Some types of construction projects (e.g., placement of fill in wetlands) can reduce ground water recharge.

The potential exists for increased diversion and export of water from the Lahontan Region. The Reno and Las Vegas, Nevada areas are growing rapidly, and are considering increased ground water pumping on the Nevada side of the state line. Such pumping could affect beneficial uses of surface and ground waters in California, including springs and wetlands in Death Valley which support endangered species. Concern has also been expressed about the migration of radionuclides from the Nevada Test Site in California ground waters in the area.

Water quality problems can also occur as a result of flooding. In some areas the potential for flooding has increased due to hydrologic modification, increased impervious surface, and disturbance of wetlands and riparian vegetation. Flooding can erode streambanks, and wash out sewer lines and stored fuels and hazardous materials. (See also Section 4.3, “Stormwater, Runoff, Erosion, and Sedimentation”; and the “Floodplain and Riparian Area Protection” discussion later in this section.)

Control Measures to Prevent or Mitigate Water Quality Problems Related to Water Quantity

Regional Board and other state, as well as federal and local, control actions related to water quantity/quality are described below.

Regional Board Control Actions

Actions which can be taken by the Regional Board to prevent or mitigate the impacts of water quality problems related to water quantity include:

1. Establishment of flow-weighted numerical water quality objectives for surface waters, based on long-term hydrologic data, in order to reduce the frequency of violations due to natural drought conditions.
2. Consideration of the flow and water supply needs of aquatic organisms, riparian/wetland vegetation, and wildlife when establishing biological water quality objectives.

4.9, Resources Management and Restoration

3. Consideration of water availability before the issuance of waste discharge requirements, and placement of conditions in requirements limiting water use in order to protect water quality. (The State Board has determined that such conditions are appropriate under limited circumstances. Because the Porter-Cologne Act provides that the Regional Board cannot specify the method of compliance, the authority to include water use limits in waste discharge requirements does not provide authority to specify water conservation measures to achieve those limits [Sawyer 1988].) One example would be placement of conditions in waste discharge requirements for hydroelectric projects to mitigate the impacts of releases from impoundments on downstream uses. (See also the "Ground Water" section in this Chapter.)
4. Issuance of waste discharge requirements for ground water recharge with imported water which is of lower quality than local ground water.
5. Issuance of waste discharge requirements for projects which would interfere with ground water recharge.
6. Encouragement of the use of Best Management Practices to minimize water use for agricultural, landscape, and turf irrigation.
7. Undertaking investigations (e.g., fact finding hearings) into ground water quality/quantity problems, and making recommendations for State Board action under Water Code Section 2100.
8. Encouragement of the use of reclaimed water wherever feasible without adverse impacts on beneficial uses. (Regional Boards are required, when establishing water quality objectives, to consider the need to develop and use reclaimed water.)
9. Recommendations to the State Board during review of construction projects which may also require water rights permits.
10. Encouragement of the adoption and implementation of wellhead protection programs. (See the discussion of well standards in the "Ground Water Protection and Management" section of this Chapter.)
11. Continued participation by Regional Board staff as observers in meetings involving proposed changes in water exportation from the Lahontan

Region (e.g., changes in the Truckee River operating agreement). Staff should also attempt to stay informed on large scale diversion proposals even when no formal meetings are being held.

12. Careful review of and consideration of waste discharge requirements for any proposals to manage vegetation or convert vegetation types in order to increase water yield from a watershed.
13. Careful staff review of CEQA documents to ensure that water quality/quantity issues are adequately addressed.

Control Measures for Water Quantity/Water Quality by other State Agencies

The Porter-Cologne Act provides authority for planning in relation to water quantity/flow issues, but implementing authority is generally separate from the authority provided by State water quality plans (Sawyer 1988).

1. Under the Public Trust Doctrine (see Chapter 1 of this Plan), the State Water Resources Control Board must consider the protection of a variety of environmental values when making decisions to issue or renew water rights permits. The State Board can grant appropriate water rights for the protection of beneficial uses, and can ensure that natural flows remain in a water body to protect designated beneficial uses. For some areas, the State Board has adopted water rights policies which give direction for future actions on water rights applications. The policy affecting the Lake Tahoe Basin was adopted in 1969 and is in need of update.
2. California water rights law does not require State permits for ground water diversions, except for underground waters which flow in defined channels (e.g., the lower Mojave River). However, the State is bound by limits such as those set by the California-Nevada Interstate Water Compact on all diversions from the Carson River and Lake Tahoe/Truckee River systems. Possible means of addressing the impacts of ground water pumping and overdraft include use of nuisance law, the Public Trust doctrine, and existing State Board authority. Adjudication of ground water rights is also possible; this could result in court appointment of a watermaster, with court-defined authority ranging from monitoring and recording to broad management powers. The State Board may also place conditions to protect ground water in grant contracts or water

Ch. 4, IMPLEMENTATION

rights permits for surface water use (Sawyer 1988). See also the discussion of Water Code Section 2100 in Section 4.6 of this Chapter.

3. The Department of Fish and Game should continue to define instream flow requirements for fish and other aquatic organisms, and should bring water quality problems related to water quantity to the attention of the State and Regional Boards. The Wildlife Conservation Board can purchase land and acquire associated riparian water rights for the protection of fish and wildlife.
4. The Attorney General of California has authority to bring legal action for protection of the natural resources of the State. This authority could be used to correct water quality problems related to water quantity.

Federal Control Measures for Water Quantity/ Water Quality

1. The U.S. Environmental Protection Agency should continue to give special attention to water quality/quantity relationships in the arid west when giving direction to states on the adoption of water quality standards and the implementation of these standards in permits.
2. The Federal Energy Regulatory Commission should give special attention to the water quality/quantity impacts of hydroelectric projects proposed within the Lahontan Region.
3. Federal land management agencies within the Lahontan Region should define the water supply needs for all beneficial uses which occur within their jurisdictions, and should bring these needs to the attention of the State Board for consideration during the formulation of water rights policies and the revision of water rights permits.

Local Control Measures for Water Quantity/ Water Quality

1. County water districts have broad authority to conserve, protect, and replenish ground water supplies. The Subdivision Map Act allows cities and counties to adopt ground water recharge facility plans, construct recharge facilities, and charge a fee for the construction of such facilities as a condition of approval for subdivision maps and building permits (Sawyer 1988).
2. State law permits the formation of local ground water management districts. A few such districts have been established within the Lahontan

Region, and more may be formed in response to proposed ground water pumping on the Nevada side of the state line. Local governments should strictly enforce well construction standards. Where wellhead protection ordinances have been adopted, they should be strictly enforced.

3. The Tahoe Regional Planning Agency has adopted an "environmental threshold carrying capacity" standard to protect fisheries in the Lake Tahoe Region. This standard provides that, until instream flow standards are established in the TRPA Regional Plan, a nondegradation standard shall apply to instream flows. The threshold standards also state the policy of the TRPA Governing Body to seek transfer of existing points of water diversion from streams to Lake Tahoe. The Best Management Practices Handbook in the 208 Plan (TRPA 1988) includes lists of approved native and "adapted" grass, shrub, and tree species for use in landscaping and revegetation.

Recommended Future Actions for Water Quantity/ Water Quality

1. The potential exists for physical solutions to water quality problems related to ground water overdraft, such as provision of alternative water supplies, artificial recharge, or the establishment of physical barriers or injection barriers to pollutants. Such solutions can be provided through the courts in connection with water rights adjudications, or as part of ground water management programs including regulation and augmentation of supply. Physical solutions could also be authorized during approval of water development projects. These solutions may involve conjunctive use projects where surface waters are used for ground water recharge or as a substitute supply for ground water users. It is important to manage ground and surface waters as an interconnected resource (Sawyer 1988).
2. Long drought periods beginning in the 1970s inspired a variety of legislation related to water conservation and reclamation. Local governments are now required to have ordinances regulating landscape irrigation. Local governments within the Lahontan Region should be encouraged to require use of native plants or species adapted to local conditions, which have low requirements for irrigation, fertilizer, and pesticides for survival and maintenance.

Reservoir Management

Reservoirs and natural lakes used as reservoirs, are widely utilized throughout the Lahontan Region to store water for municipal and agricultural supply. These reservoirs also supply aquatic and wildlife habitat and meet ground water recharge, recreation, and flood control needs. Reservoir operations and maintenance activities can impact water quality and beneficial uses both within and downstream of reservoirs.

Reservoir release practices can result in the release of high levels of nutrients and sediments, deoxygenated water, or insufficient downstream flows to sustain fish and maintain aquatic habitats. The release of deoxygenated water from the bottom of reservoirs is extremely detrimental as it can result in large downstream fish kills. Likewise, the release of warmer water can also impact downstream aquatic life forms. Reservoir discharges through improperly designed spillways can increase downstream erosion.

Stored or impounded water can develop taste and odor problems caused by algal growth or other microorganisms. Water impoundment can also cause water temperature to increase. Temperature differences between inflowing water and reservoir surface water can result in the formation of density or turbidity currents. These currents plunge below the surface, carrying any sediment load to the reservoir dam.

Point and nonpoint sources of pollution within a reservoir's drainage area, such as fertilizer applications, bank erosion, timber harvesting, stormwater runoff, wastewater discharges and industrial discharges, can contribute to the sediment and nutrient load into a reservoir. High nutrient levels in a reservoir can contribute to accelerated eutrophication and/or impact downstream waters. Most reservoirs act as large sediment basins and accumulate sediments. Coarse sediments usually deposit in a delta at the head of the reservoir, while finer sediment can remain in suspension and may eventually settle in the deepest pools or be carried to the dam. Some pollutants, such as metals, can be re-suspended from the sediments into the water column. Certain conditions, such as flooding or reservoir dewatering, can cause accumulated reservoir sediments to be discharged into downstream waters.

Dredging is sometimes used to remove sediment, and to control internal nutrient cycling and macrophyte growth. However, dredging itself can impact water quality and beneficial uses. Specific

impacts and regulation of dredging are discussed in the "Boating and Shorezone Recreation" discussion of the "Recreation" section of this Chapter.

Control Measures for Reservoirs

(See also Control Measures for Lake Restoration later in this Section.)

The reservoirs (both constructed and natural lakes operated as reservoirs) in the Lahontan Region and their beneficial uses are listed in Chapter 2. Past control measures for these reservoirs included adoption of waste discharge requirements (WDRs) for construction activities (regulation of discharges related to waste earthen materials, stormwater runoff, construction-related wastes, domestic wastewater generated during construction). WDRs have also been adopted for hydroelectric projects associated with reservoirs (hydroelectric projects are discussed in the "Mining, Industry, and Energy Development" section of this Chapter). The WDRs included surface water discharge limitations for a variety of water quality parameters including nutrients, turbidity, pH, taste, odor, temperature and algal growth potential, as well as Best Management Practices (BMPs) to prevent discharge of waste earthen materials. Construction of future reservoirs will be regulated in a similar manner. During review of any future proposed reservoirs, the Regional Board will coordinate closely with the State Board's Division of Water Rights, California Department of Fish and Game, California Division of Dam Safety, as well as other agencies.

Recommended Future Actions for Reservoir Management

In addition to careful review of proposed new reservoirs, the Regional Board should focus on operations and maintenance of existing reservoirs to minimize impacts on water quality and beneficial uses. This regulation should incorporate relevant provisions contained in the State Board's Thermal Plan. (The Thermal Plan is summarized in Chapter 6.) Through MAAs, MOUs or WDRs, operation and maintenance activities such as dredging, discharges, and repairs should include control measures to prevent increases in nutrient levels and sediment loads, as well as BMPs to prevent downstream bank erosion and impacts to downstream aquatic habitats. The Regional Board should consider a prohibition against the release of deoxygenated water from reservoirs.

Wetlands Protection and Management

California historically supported an estimated 5 million acres of wetlands. Wetlands have not always been considered as valuable natural resources. Thus, in California, an estimated 91 percent of wetlands have been lost due to alterations in their biological, chemical and physical properties (National Research Council 1992). The remaining wetlands are considered very valuable resources. Wetland values and functions include high productivity, water purification, flood control, nutrient removal and transformation, sediment stabilization and retention, water supply, ground water recharge and erosion control. The high biological productivity of wetlands results in important wildlife habitat for both aquatic and terrestrial animals and plants, including feeding, breeding and nursery grounds. A greater than average number of rare species are found in wetland habitats. Wetlands also provide a number of other scientific, educational and aesthetic uses.

The statewide Water Quality Assessment database (see Chapter 7 of this Basin Plan) lists some of the wetlands within the Lahontan Region. The Regional Board also maintains a separate wetland database that includes general locations (maps), descriptions, and assessments of the condition of many wetlands within the Region. Because of the seasonality of rainfall in the Region, some wetlands may not be easy to identify by simple means (e.g., aerial photographs) or by obvious wetland characteristics. Thus, site-specific boundaries of the Region's wetland areas will be determined on an as-needed basis using methods in the current "Federal Manual for Identifying and Delineating Jurisdictional Wetlands" (U.S. Army Corps of Engineers, 1987) performed by certified wetland delineators (certification program established in accordance with Section 307[e] of the Water Resources Development Act of 1990) or by other qualified professionals acceptable to the Regional Board. A separate method of identifying "Stream Environment Zones" in the Lake Tahoe Basin is used for regulatory purposes in that watershed (TRPA 1988, Vol. III).

Wetlands within the Region are defined to include areas that are "inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (including) playa lakes, swamps, marshes, bogs and similar areas such as sloughs, prairie potholes, wet meadows,

prairie river overflows, mudflats, and natural ponds" (40 CFR § 110.1[f]).

The federal Clean Water Act formally equates "navigable waters" with "waters of the United States" (§ 502[7]). The Code of Federal Regulations also equates "navigable waters" to "waters of the United States" and specifically incorporates wetlands in navigable waters definitions, including those for interstate and intrastate waters (40 CFR § 232.2[q]). The Porter-Cologne Water Quality Control Act (CA Water Code § 13050[e]) defines "waters of the State" to be "any water, surface or underground, including saline waters, within the boundaries of the State." Thus, wetlands are both waters of the State and waters of the United States. Therefore, provisions of the California Water Code apply. These provisions include protection of beneficial uses and water quality. Beneficial uses of wetlands are listed in Chapter 2 of this Plan. Water quality objectives which apply to surface waters, including wetlands, are included in Chapter 3 of this Plan. (The Regional Board recognizes that the natural pH of some wetlands may not meet the pH narrative objective.)

Numeric criteria to protect one or more designated uses of surface waters have been developed by the U.S. Environmental Protection Agency (USEPA). Where appropriate, these criteria directly apply to wetlands. For example, wetlands which actually are, or recharge, municipal water supplies should meet human health criteria. The USEPA numeric criteria for protection of freshwater aquatic life, as listed in "Quality Criteria for Water—1986," although not developed specifically for wetlands, are generally applicable to most wetland types (USEPA 1990).

As with other types of surface waters, such as saline or alkaline lakes, natural water quality characteristics of some wetlands may not be within the range for which the criteria were developed. Adjustments for pH, hardness, salinity, temperature, or other parameters may be necessary.

Impacts to the water quality of wetlands can negatively affect any or all of the wetlands' functions and values. Thus, the following control measures are necessary to protect wetlands.

Control Measures for Wetland Protection

As direction for implementing control measures for wetlands protection, the Regional Board will use Senate Concurrent Resolution No. 28 which states that "It is the intent of the Legislature to preserve, protect, restore, and enhance California's wetlands

and the multiple resources which depend upon them for the benefit of the people of the State.”

Regional Board and other State, as well as federal and local, wetland protection control actions are described below and apply to all wetlands which are considered “waters of the State” and/or “waters of the United States.” Additional control measures applicable to “Stream Environment Zones” in the Lake Tahoe Basin are discussed in Chapter 5. Control measures specific to constructed/artificial wetlands are also included below, and in the sections of this Chapter on “Wastewater” and “Stormwater.” The “Stormwater” section includes a detailed discussion of the use of wetlands for stormwater treatment. Control measures specific to wetland restoration are discussed separately, later in this section.

Regional Board Control Measures for Wetland Protection and Management

1. For proposed discharges of municipal wastewater, stormwater, solid wastes, earthen materials, or other wastes to wetlands, the Regional Board will ensure that wetlands are afforded the same level of protection as other types of surface waters with respect to standards and minimum treatment requirements. For discharges to wetlands, all applicable water quality standards for the wetland and any adjacent waters must be met. Recommended conditions pursuant to Clean Water Act Section 401 Water Quality Certification, waste discharge requirements, monitoring and inspections programs, Cease and Desist/Clean-up and Abatement Orders will be implemented as necessary. The monitoring may include water quality, sediment quality, whole effluent toxicity and biological measurements such as diversity indices. Monitoring the fate of persistent or bioaccumulative contaminants may also be required by the Regional Board.
2. Hydrology is a major factor influencing the type and location of wetlands. To protect the beneficial uses and water quality of wetlands from impacts due to hydrologic modifications, the Regional Board will carefully review proposed water diversions and transfers (including ground water pumping proposals), and require or recommend control measures and/or mitigation as necessary and applicable.
3. In conjunction with beneficial use designations and water quality objectives, the Regional Board will implement the State Board's Resolution No.

68-16 “Statement with Respect to Maintaining High Quality Waters In California” (see “Nondegradation Objective” in Chapter 3; also see Chapter 6, “Plans and Policies”) to regulate point and nonpoint source discharges to wetlands, particularly for those types of impacts difficult to assess through compliance with established water quality objectives alone (e.g., impacts due to physical and hydrological modifications).

4. The Clean Water Act Section 401 program (Water Quality Certification process) gives the Regional Board extremely broad authority to review proposed activities in and/or affecting the Region's waters (including wetlands). The Regional Board can then recommend that the State Board grant, deny, or condition certification of federal permits or licenses that may result in a discharge to “waters of the United States” (e.g., U.S. Army Corps of Engineers CWA Section 404 permits, licenses from the Federal Energy Regulatory Commission). The Regional Board, in coordination with the State Board, will use this authority to prevent impacts to beneficial uses of wetlands and/or violation of wetlands water quality objectives. In addition to recommending that the State Board grant, deny or condition certification of federal permits or licenses, the Regional Board has independent authority under the California Water Code to regulate discharges to wetlands through waste discharge requirements or other orders (see No. 1 above).
5. Many beneficial uses and the water quality of wetlands can be impacted by filling and dredging. For proposed discharges due to dredging activities, and for proposed discharges of dredged and/or fill materials into wetlands regulated under Clean Water Act Section 404 (U.S. Army Corps permit program), the Regional Board will utilize the process described above in No. 4.

Note: U.S. Army Corps Section 404 nationwide permits for discharges of dredge and fill materials are not certified, except under certain conditions, for discharges which will affect “Special Aquatic Sites.” Special Aquatic Sites are defined in the “Special Designations to Protect Water Resources,” at the beginning of this Section.

During its review of projects proposing discharges of dredged and/or fill materials into wetlands, the Regional Board will consider whether the project is water dependent and

Ch. 4, IMPLEMENTATION

whether there are viable project alternatives. For projects where no viable alternatives exist, the Regional Board will consider whether wetland impacts can be made acceptable through certification and/or permit conditions. The Regional Board may elect to use its independent authority under the California Water Code to regulate discharges to wetlands through waste discharge requirements or other orders (see No. 1 above).

6. The Regional Board now coordinates wetlands permitting with other agencies. Staff will work with local governments toward further streamlining of the permitting process by facilitating earlier consultation with and coordination among all permitting agencies, including the U.S. Army Corps of Engineers and the California Department of Fish and Game. Improved coordination may also include measures such as development of a single permitting package containing necessary forms and instructions for all appropriate agencies, with coordinated review times, and development of Memoranda of Understanding with local governments.
7. The Regional Board will also explore the feasibility of streamlining permitting by defining wetland values and mitigation requirements on an areawide basis (e.g., for an existing subdivision) and then issuing general waste discharge requirements, waiving waste discharge requirements, or recommending waiver of Water Quality Certification for subsequent individual projects in that area. Areawide permits, or new Regional Board policy language, would define the specific types of wetland disturbance covered and the extent of mitigation required. This process could be coordinated with the U.S. Army Corps of Engineers' Special Area Management Plan (SAMP) process and/or with local governments' wetlands plans and policies (see the section below on "Local Control Measures for Wetland Protection and Management"). Areawide general permits or new Regional Board policies would require CEQA compliance, with project level detail on required mitigation.
8. For proposed fill activities or other discharges which will result in wetland loss, the Regional Board will require compensatory mitigation so that there will be no net loss of wetland acreage and no net loss of wetland functions and values when the project and mitigation lands are evaluated together. The Regional Board may require an inventory of wetland characteristics to

take place prior to wetland disturbance to determine wetland size, functions and values, to serve as a guide for wetland restoration or creation, and to form a comparative basis for evaluating the success of the mitigation project.

In determining the functions and values of the wetland, the Regional Board will consider integrated physical, chemical and biological wetland parameters including water purification, flood control, nutrient removal and transformation, sediment stabilization and retention, water supply, ground water recharge/discharge, erosion control, recreation, wildlife diversity/abundance and aquatic diversity/abundance. Suggested methods to determine wetland function and values are shown in Table 4.9-2. The Regional Board will consider wetland function and value determinations made by other methods such as the Wetland Evaluation Technique (WET) developed by Adamus et al. (1987) for the U.S. Army Corps of Engineers. Wetland function and value determinations made using other methodologies will be considered by the Regional Board on a case-by-case basis. In recognition that determining wetland function and value uses relatively new methods, the Regional Board will carefully and judiciously make wetland function and value determinations. The Regional Board will also track the development of new methodologies, and review such methodologies for application in future wetland function and value determinations.

The Regional Board will consider wetland boundaries determined by using the U.S. Army Corps of Engineers' 1987 "Federal Manual for Identifying and Delineating Jurisdictional Wetlands." Delineation of wetlands shall be performed by certified wetland delineators (certification program established in accordance with Section 307[e] of the Water Resources Development Act of 1990) or by other qualified professionals.

The Regional Board will coordinate all wetland mitigation requirements with those of the U.S. Army Corps of Engineers.

9. The Regional Board prefers avoidance of wetland disturbance to disturbance followed by mitigation such as restoration or creation. In its review of projects with potential wetland impacts, the Regional Board will follow the sequence of:

4.9, Resources Management and Restoration

Avoid; Minimize; Mitigate. Through a thorough analysis of project alternatives, the project proponent must first demonstrate to the Regional Board that wetland impacts are not avoidable. If the impacts are not avoidable, the proponent must then demonstrate that the impacts to the wetland area are the minimum necessary for the project. The project proponent must then propose mitigation to compensate for any wetland impacts.

When mitigation is necessary, the Regional Board prefers in-kind, on-site mitigation whenever possible. If not possible, the Regional Board will then consider in-kind, off-site mitigation. As a last choice, the Regional Board will consider out-of-kind mitigation. "In-kind" means that the mitigation wetland site will have similar function and value to that of the disturbed wetland site in terms of physical, chemical and biological wetland parameters including water purification, flood control, nutrient removal and transformation, sediment stabilization and retention, water supply, ground water recharge/discharge, erosion control, recreation, wildlife diversity and abundance, and aquatic species diversity and abundance. "Out-of-kind" means that the mitigation wetland site will substantially differ from the disturbed wetland site in regard to these same parameters.

Regional Board staff is available to assist the project proponent by identifying potential mitigation opportunities. The Regional Board may accept payment by the project proponent to a mitigation bank or to another entity that will provide the required mitigation.

10. Restoration of an historic wetland (once functioning wetland but now damaged or destroyed) generally will have a greater chance of success in terms of restoration of wetland functions and long-term persistence than constructed wetlands at an upland site (Kusler and Kentula 1990). Thus, for mitigation purposes, the Regional Board prefers wetland restoration rather than wetland creation.
11. For restored or created wetlands, measures may be necessary to protect the wetland from excessive sedimentation, foot traffic, offroad vehicles, exotic species, or other factors that may inhibit wetland functions or degrade wetland values. Protective measures may include buffers (between the mitigation site and the surrounding

area), fences or other barriers, and sedimentation basins. Thus, the Regional Board will require that the proposed mitigation provide for buffer zones or other protective measures, as appropriate.

12. When mitigation is necessary, the Regional Board will require, as a waste discharge permit condition, or as a recommended condition for Clean Water Act Section 401 Water Quality Certification, that a mitigation plan be prepared and executed. The plan must demonstrate that no net loss of wetland acreage and no net loss of wetland functions and values will occur when the project and mitigation lands are evaluated together. Proof of ownership, easement, or similar documents for the mitigation site must be provided in the mitigation plan. The plan should also clearly establish specific goals of the mitigation that can be targeted in subsequent evaluations. Wetland restoration or creation proposed as compensatory mitigation, which could or will result in a waste discharge, will be regulated as necessary by the Regional Board to ensure compliance with all provisions of this Basin Plan (see also "Wetland Restoration" discussion later in this Section, as well as "Constructed Wetlands" discussion in Section 4.4 of this Chapter). For both restored or created compensatory wetlands, the mitigation plan should include details of establishing and maintaining the restored wetland, as well as a monitoring program to evaluate the status and success of the restoration or creation.
13. Created wastewater treatment wetlands designed, built, and operated solely as wastewater treatment systems are generally not considered to be waters of the United States (USEPA 1990). Water quality standards that apply to natural wetlands generally do not apply to such created wastewater treatment wetlands. However, many created wetlands are designed, built, and operated to provide, in addition to wastewater treatment, functions and values similar to those provided by natural wetlands. Under these circumstances, such created multiple use wetlands may be considered waters of the U.S. and applicable water quality standards would apply. The applicability of water quality standards to created wetlands will be determined by the Regional Board on a case-by-case basis. In its determination, the Regional Board will consider factors such as size, type of waste to be treated, location, degree of isolation of the created wetlands, and other appropriate factors.

Ch. 4, IMPLEMENTATION

Any discharge from a created wetlands which does not qualify as “waters of the U.S.” must meet applicable water quality standards of its receiving water(s).

Control Measures for Wetland Protection and Management by Other State Agencies

1. Through required conditions in its Lake/Streambed Alteration Permits, the California Department of Fish and Game can provide some wetland protection, especially for fish and wildlife resources, and other aquatic resources.
2. The California Resources Agency, including the Departments of Fish and Game and Water Resources, is developing a comprehensive wetlands conservation plan. State Board staff is participating in the Resources Agency's planning process. An implementation strategy is to be included in the conservation plan. The strategy may include specific legislation, bond acts, administrative law changes, and other means as necessary to accomplish the goals of the conservation plan.
3. The California Department of Parks and Recreation has developed a Wetlands Protection Policy.
4. The California Department of Forestry utilizes a streamside protection zone system which provides some wetlands protection.

Federal Control Measures for Wetland Protection and Management

1. The United States Army Corps of Engineers (COE) addresses intrusions into navigable waters and issues permits for discharge of fill and dredge material to navigable waters (including wetlands). These permits are referred to as Clean Water Act (CWA) Section 404 permits. In its permitting process, the COE considers comments from other federal agencies, such as the U.S. Fish and Wildlife Service and from state agencies, such as the Regional Board and the California Department of Fish and Game. The permits are reviewed by the U.S. Environmental Protection Agency. The USEPA has veto authority over COE CWA Section 404 permits for discharges to navigable waters.
2. Under the Emergency Wetlands Resources Act of 1986, the U.S. Fish and Wildlife Service (USFWS) is required to complete the mapping of wetlands within the lower 48 states by 1998 through the National Wetlands Inventory and to

assess the status of the nation's wetland resources every ten years. The maps, status and trends resulting from the USFWS's work will provide necessary documentation to support additional wetlands protection measures if necessary.

3. The U.S. Forest Service utilizes a streamside protection zone system which provides some wetlands protection.

Local Control Measures for Wetland Protection and Management

1. The Tahoe Regional Planning Agency, in cooperation with the Regional Board, implements discharge prohibitions and other protection measures for “Stream Environment Zones,” including wetlands, in the Lake Tahoe Basin (see Chapter 5 of this Plan).
2. Mono County is developing a Wetland Preservation Policy. The draft policy includes wetlands protection or “buffer” zones, development guidelines and mitigation requirements including provisions for the development of a local mitigation bank.
3. The Mojave River Task Force, with members from the staff of the Town of Apple Valley, the Cities of Hesperia and Victorville and San Bernardino County Regional Parks, is developing a multiple objective resource management plan for the Mojave River Corridor (San Bernardino County). One main objective of the plan is to balance the many uses of the riparian corridor such as wetland habitat, recreation and flood control while still providing the necessary level of resource protection.

Recommended Control Measures for Wetland Protection and Management

1. When practical, where wetland restoration or creation is required as mitigation, the Regional Board should consider requiring that the mitigation be completed **before** allowing wetland disturbance to occur.
2. Because of the risks inherent in restoring or creating certain wetland types, such as those which support threatened or endangered species or unique biological communities, area ratios of disturbed to restored/created wetlands should be 1:1.5, 1:2, or higher, for some mitigation projects. Larger mitigation areas increase the likelihood of successfully restoring or creating the wetland function and value of the disturbed wetland.

3. Design of wetland restoration and creation should consider the relationship of the wetlands to the watershed (including water sources, other wetlands, adjacent upland and deep water habitats).
4. The Regional Board should encourage local government entities to develop and execute wetland protection policies. The policies should include provisions to develop local mitigation banks whose primary focus is on the restoration of historic wetland sites (once functioning wetland sites that are now damaged or destroyed).
5. The Regional Board should encourage evaluation of past wetland mitigation efforts to guide future efforts.
6. The Regional Board should discourage wetland disturbance in areas designated by the California Department of Fish and Game as Significant Natural Areas (see "Special Designations to Protect Water Resources" at the beginning of this Section).

Floodplain and Riparian Area Protection

(See also "Wetlands" discussion above, and the discussion of discharge prohibitions in Section 4.1.)

A 100-year floodplain is defined as the extent of a flood that has a statistical probability of occurring once in 100 years. Floods of this extent may occur more than once every 100 years, and floods of even greater extent are possible. Most state, federal and local floodplain protection planning is based upon the 100-year floodplain. Floodplains often include wetland and riparian areas which may extend beyond the limits of the 100-year floodplain. Riparian areas are typically defined as the terrestrial moist soil zone immediately adjacent to wetlands, lakes, and both perennial and intermittent streams.

Undisturbed floodplains and riparian areas provide natural storage for flood waters and thus moderate downstream flood flows and augment dry season (base) flows. The wetland and riparian areas of floodplains can provide water treatment including settling of suspended matter as flood flows are slowed, physical filtration of sediment and associated chemicals by vegetation, uptake of nutrients by roots and foliage, adsorption of chemicals on soil particles, and uptake and chemical transformation of substances by soil microorganisms. Riparian areas are important habitat for fish and other wildlife

(including significant habitat for threatened or endangered species), providing drinking water, abundant food, a moderate climate (with more shade and cooler temperatures than many upland areas), and shelter. Riparian areas support abundant and diverse mixtures of plant and animal life. An estimated 25 percent of California's mammals, half of its reptiles, and three-fourths of its amphibians are closely associated with riparian areas (Warner and Hendrix 1984). Riparian vegetation is important in providing streambank stability and shading, temperature control, and food for aquatic systems.

In addition to the values of flood control, water quality protection, base flow augmentation, and wildlife habitat, floodplains and riparian areas can provide opportunities for dispersed recreation, access points for water contact recreation, and open space for aesthetic enjoyment. As all of these values can be impacted by development or other disturbances in the floodplain and riparian areas, protection measures are necessary.

Control Measures for Floodplain and Riparian Areas

Regional Board and other state, as well as federal and local, floodplain and riparian protection control actions are described below.

Regional Board Floodplain Control Actions

Regional Board prohibitions regarding floodplains, as well as prohibition exemption criteria, are described in the Waste Discharge Prohibitions section of this Chapter, and in the Lake Tahoe Chapter.

Control Measures for Floodplain and Riparian Areas by other State Agencies

1. California Executive Order 8-39-77 directs that "all agencies responsible for programs which affect land use planning, including state permit programs, shall take flood hazards into account in accordance with recognized floodway and 100-year frequency flood design standards when evaluating plans and shall encourage land use appropriate to the degree of hazard involved."
2. The California Department of Water Resources (1980) flood management policy includes the following provisions:
 - The preferred method of flood damage reduction is to adjust use and occupancy of the floodplain through management or regulation of uses, rather than solely by structural works in the stream;

Ch. 4, IMPLEMENTATION

- Structural flood damage reduction projects should usually be limited to those already developed areas in which flood-proofing or relocation of development is not economically or socially feasible;
 - The social values of essentially natural streams will be recognized, and flexibility in degree of protection will be considered where a community so desires since the traditional solution of channelization or elimination of a stream is often seen as a bigger problem by the community;
 - The structural integrity of existing flood protection works must be assured through effective management and surveillance programs, accompanied by programs to deal with residual risks;
 - Flood management efforts will be carried out in a way that incorporates ground water recharge, wetland, fish and wildlife protection and enhancement, and recreational development as integral parts of the flood management program. This includes recognition of the values of wetland and riparian habitat and native vegetation and maximum efforts to preserve these values and resources.
3. California Department of Forestry and Fire Protection (CDF) Forest Practice Rules (Rules) detail specific best management practices to protect riparian areas during timber harvest operations on non-federal lands throughout California. These Rules require establishment of Watercourse and Lake Protection Zones adjacent to lakes, streams, wetlands, and springs to exclude equipment, roads, and landings, and to retain sufficient canopy cover.
 4. Other state agency programs which may regulate floodplain and riparian protection activities include the Department of Fish and Game's stream alteration permit program and endangered species review process (see "Sensitive Species and Biological Communities" discussion later in this section).

Federal Control Measures for Floodplain and Riparian Areas

1. The 1977 Executive Order 11988 (floodplain management) and Executive Order 11990 (wetlands) directed federal agencies to avoid actions that would adversely affect floodplains

and wetlands. The floodplain order states that if avoidance is not practical, agencies are to restore and preserve natural floodplain values. The order also provided a basis for coordination among the many federal agencies with floodplain management authority.

2. A U.S. Forest Service policy (Leven 1984) provides that preferential consideration be given to riparian area-dependent resources over other resources and activities when conflicts occur.
3. The U.S. Army Corps of Engineers federal Clean Water Act Section 404 permit program for dredging and filling activities also affects floodplains. For details of the Section 404 permit program, see "Wetlands Protection" discussion above.

Local Control Measures for Floodplain and Riparian Areas

Many counties in the Region provide general protection for floodplains and riparian areas through zoning, land use ordinances and the project review process. Examples include specified buffer zones, building setbacks, grading limits, and building bans within floodplains.

Recommended Future Actions for Floodplain and Riparian Areas

1. For proposed projects with probable floodplain impacts where floodplains have not been mapped by FEMA or the Corps of Engineers, the Regional Board should require appropriate floodplain mapping by the project applicant.
2. The Regional Board should consider adopting floodplain discharge prohibitions for other environmentally sensitive areas of the Region such as Mammoth Lakes.
3. The Regional Board should continue to promote protection of riparian areas on U.S. Forest Service, U.S. Bureau of Land Management, and non-federal grazing operations, allotments, and leases.

Forest Management

Forested lands are found throughout the Lahontan Region. Management of these lands can include timber harvests, fire suppression, the use of prescribed fire, and other activities. Forest management activities can also include the use of pesticides and various restoration techniques. Restoration techniques and pesticide use are discussed elsewhere in this Chapter.

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ENCLOSURE 4

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AB 1471 (Rendon) Water Quality, Supply, and Infrastructure Improvement Act of 2014

\$7.12 Billion; Version August 13, 2014

Chapter 5.	Clean, Safe, and Reliable Drinking Water	\$520 million	Section
• \$260 million	Small Community Grant Fund	State Water Board	79723
• \$260 million	Public water system improvements		79724(a)
• \$2.5 million	Matching funds for DACs	State Water Board	(c)
<i>At least 10% to projects serving severely DACs; Up to 20% for technical assistance to DACs</i>			
Chapter 6.	Protecting Rivers, Lakes, Streams, Coastal Waters and Watersheds	\$ 1.495 Billion	Section
• \$327.5 million	Multibenefit water quality, supply and watershed projects	Conservancies	79731
• \$200 million	Enhance stream flow projects	Wildlife Conservation Board	79733
• \$100 million	Protect and Enhance urban creek	Resources Agency	79735 (a)
• \$20 million	Watershed and urban rivers enhancement projects	Secretary	(b)
• \$475 million	Settlement Agreements (Tahoe, Klamath, etc).	Natural Resources Agency	79736
• \$285 million	Watershed restoration projects	Department of Fish and Wildlife	79737
• \$87.5 million	Water quality, ecosystem restoration, and fish protection facilities that benefit the Delta	Department of Fish and Wildlife	79738
Chapter 7.	Regional Water Security, Climate, and Drought Preparedness	\$ 810 million	Section
• \$810 million	Projects that implement an adopted IRWM		79740
• \$510 million	Allocated by hydrologic region	Hydrologic regions	79744
• 10%	Involvement of DACs	Department of Water Resources	79745
• \$100 million	Water Conservation and water-use efficiency		79746
• \$200 million	Stormwater management projects	State Water Board	79747
Chapter 8.	Statewide Water System Operational Improvement	\$ 2.7 Billion	Section
• \$2.7 billion	Water storage public benefits projects	Cal Water Commission	79750
• *Continuously			
Chapter 9.	Water Recycling	\$725 million	Section
• \$625 million	Water recycling and advanced treatment projects	State Water Board	79765
• \$100 million	Desalination	Department of Water Resources	
Chapter 10.	Groundwater Sustainability	\$900 million	Section
• \$900 million	Prevent/ cleanup contamination of groundwater that serves as drinking water	State Water Board	79771
• \$80 million	Treatment and remediation		79722
• \$100 million	Develop and implement groundwater plans and projects	Department of Water Resources	79775
<i>At least 10% to projects serving severely DACs</i>			
Chapter 11.	Flood Management	\$395 million	Section
• \$295 million	Statewide flood management activities	Department of Water Resources	79780

Red lettering indicates the Water Board is specifically identified as the administering agency