Annex O Placer County Water Agency

O.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Placer County Water Agency (PCWA), a participating jurisdiction to the Placer County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the base plan document. As such, all sections of the base plan, including the planning process and other procedural requirements apply to and were met by the Agency. This Annex provides additional information specific to the PCWA, with a focus on providing additional details on the risk assessment and mitigation strategy for the Agency.

O.2 Planning Process

As described above, the Agency followed the planning process detailed in Section 3 of the base plan. In addition to providing representation on the Placer County Hazard Mitigation Planning Committee (HMPC), the Agency formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table O-1. Additional details on plan participation and City representatives are included in Appendix A.

Table O-1 Agency Planning Team

Name	Position/Title	How Participated
Peter Cheney	Risk and Safety Manager	Attended meetings, coordinated participation and content, research, editing and review.
Ed Horton	Consultant	Consult, research, edit and review
Tony Firenzi	Deputy Director of Technical Services	Consult, research, edit and review
Matt Young	Director of Customer Services	Consult, research, edit and review
Michael Wilihnganz	Director of Administrative Services	Consult, research, edit and review
Tom Reeves	Director of Field Services	Consult, research, edit and review
Brent Smith	Director of Technical Services	Consult, research, edit and review
Joseph Parker	Director of Finance	Consult, research, edit and review
Andy Fecko	Director of Resource Development	Consult, research, edit and review

Name	Position/Title	How Participated
Jay L'Estrange	Director of Power Generation	Consult, research, edit and review
Placer County	LHMP Committee	Participated in meetings and forums

Coordination with other community planning efforts is paramount to the successful implementation of this plan. This Section provides information on how the Agency integrated the previously-approved 2010 Plan into existing planning mechanisms and programs. Specifically, the Agency incorporated into or implemented the 2010 LHMP through other plans and programs shown in Table O-2.

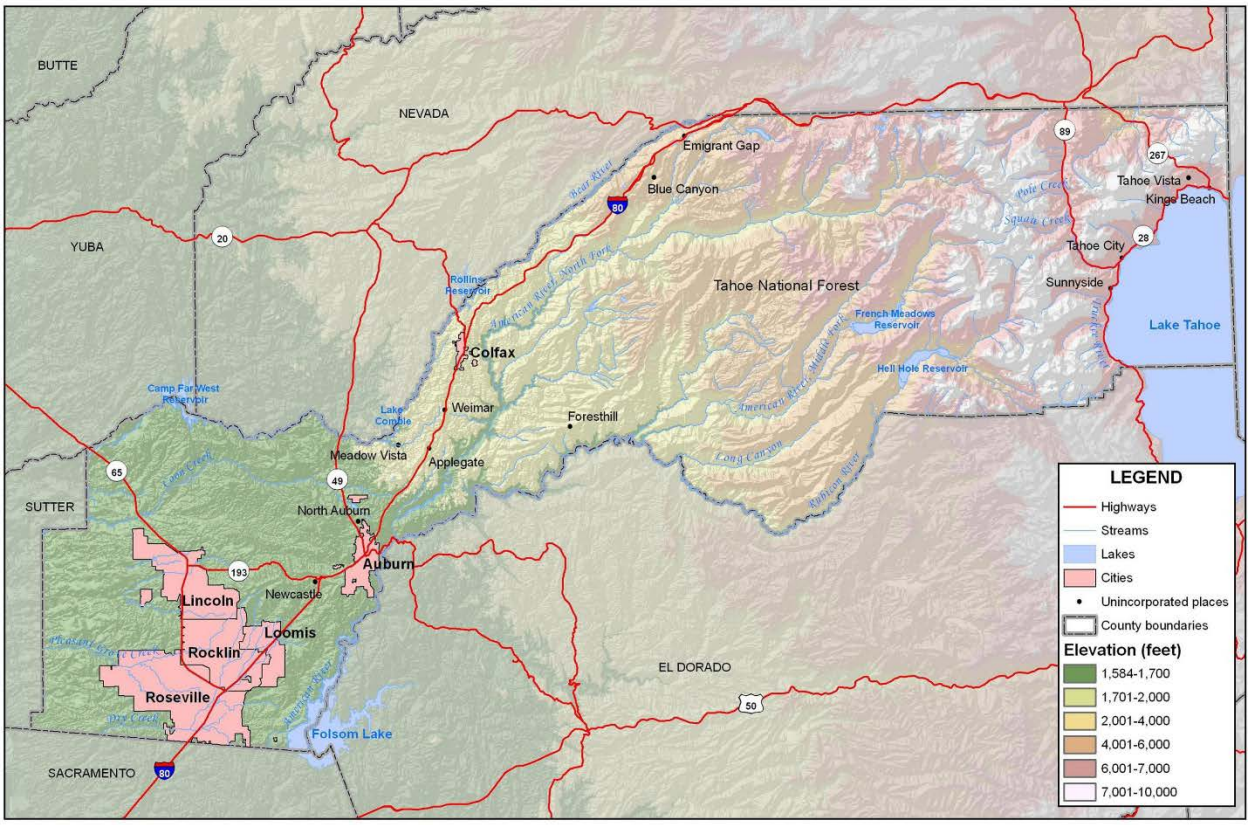
Table O-2 2010 LHMP Incorporation

Jurisdiction	Planning Mechanism 2010 LHMP Was Incorporated/Implemented In. Details?
PCWA	Capital Improvement Program: Large projects are reviewed through the Capital Improvement Program (CIP)
PCWA	Many smaller projects and efforts are occurring continually and are incorporated in Operation and Maintenance Budgets. (O&M)
PCWA	FERC Dam Safety Plans & FERC Applications

O.3 Agency Profile

The PCWA service area is illustrated in Figure O-1.

Figure O-1 Placer County Water Agency's Service Area



Source: PCWA

O.3.1. Agency Information and Background

The Placer County Water Agency (PCWA) encompasses the entire, 1,500-square-mile boundary of Placer County, ranging from the rim of the Sacramento Valley on the west to the Sierra Nevada and Lake Tahoe on the east. PCWA is headquartered in Auburn, the County seat of Placer County, nestled into California's Gold Country. The Agency is self-governed with policy and regulatory decisions determined by an independently elected five-member Board of Directors.

The Placer County Water Agency was created under its own state legislation entitled the "Placer County Water Agency Act," adopted in 1957 by the California State Legislature. PCWA carries out a broad range of responsibilities including water resource planning and management, retail and wholesale supply of irrigation, drinking water and production of hydroelectric energy.

PCWA has involvement in various watershed areas including the American River, Yuba and Bear rivers, the Lake Tahoe/Truckee River system, the Central Valley Project, and Bay/Delta system.

Water Supply

The PCWA Water System supplies irrigation and treated water in four service zones in Central and Western Placer County, generally located along the Interstate 80 corridor between Roseville and Alta.

The Agency operates an extensive raw water distribution system that includes 165 miles of canals, ditches, flumes and several small reservoirs. Raw water feeds the treatment plants and a significant amount of Agency raw water irrigates agricultural land and golf courses. Drinking water is produced through a network of eight water treatment plants. About 20 percent of the water supplied by PCWA is retail treated drinking water; about 80 percent is for irrigation and some portion thereof for wholesale transfer. More than 150,000 people depend on PCWA water supplies.

Other water purveyors in Placer County include: PG&E, Alpine Meadows Water Association, Applegate Community Water Association, Central Eden Valley, Christian Valley Community Service District, Dutch Flat Mutual, Eden Valley Line, Foresthill Public Utility District, Heather Glen Community Services District, Meadow Vista County Water District, Midway Heights Community Water District, North Eden Valley Water Association, The Weimar Institute, and The Weimar Water Company.

Treated Water

Surface water supplied by PCWA originates in the Sierra snowpack. Sources for PCWA treated water systems include the Yuba-Bear and American River watersheds. The source water for the treatment plants is supplied by a network of canal systems operated and maintained by PCWA and PG&E. The PCWA treated water systems supply consumers through more than 602 miles of agency maintained pipe to over 38,500 service connections.

The Agency's seven treated water systems including Alta, Applegate, Bianchi, Auburn/Bowman, Colfax, Foothill-Sunset, and Monte Vista. Six of the water systems are supplied through water treatment plants that treat surface water supplied via the PCWA canal system. The Bianchi system serves surface water purchased from the City of Roseville.

Irrigation

About two thirds of the water supplied annually by PCWA is used for irrigation on the farms, ranches, landscapes, parks and golf courses of Placer County. The Agency operates 165 miles of canals, reservoirs, and diversions to supply customers with untreated "raw" water. About 3,700 irrigation water customers purchase deliveries off the canal system. The irrigation season normally runs from April 15 through October 15; however, many customers purchase water year round. The irrigation season typically begins two weeks later in the higher elevation service areas around Colfax. Canal repair outages are typically scheduled in the fall.

The PCWA irrigation water system also provides water for wildlife, riparian habitat, fire protection, recreation and scenic beauty. The Agency is very active in protecting the watershed and the quality of its source water.

Power System

The PCWA Power System operates the Middle Fork American River Project (MFP), which is the eighth largest public power project in California. Completed in 1967 the MFP includes two major reservoirs, Hell Hole and French Meadows, seven dams, five hydroelectric power plants, and 24 miles of tunnels and related facilities. The project also includes recreational opportunities and facilities located adjacent to the high mountain reservoirs.

PCWA has a power generation capacity of 244 megawatts and in the average year produces enough clean, hydroelectric energy to power more than 100,000 homes. PCWA's power output is sold to the Pacific Gas & Electric Company.

O.4 Hazard Identification and Summary

The Agency's planning team identified the hazards that affect the Agency and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to the Agency (see Table O-3).

Table O-3 Placer County Water Agency Hazard Identification Table

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance
Agricultural Hazards	Significant	Occasional	Critical	Medium
Avalanche	Limited	Occasional	Limited	Medium
Dam Failure	Significant	Occasional	Catastrophic	High
Drought and Water Shortage	Extensive	Highly Likely	Critical	High
Earthquake	Extensive	Occasional	Catastrophic	High
Flood: 100/500 year	Extensive	Occasional	Limited	High
Flood: Localized Stormwater Flooding	Significant	Highly Likely	Limited	Medium
Landslides and Debris Flows	Significant	Likely	Limited	Medium
Levee Failure	Limited	Occasional	Critical	Medium
Seiche (Lake Tsunami)	Significant	Unlikely	Catastrophic	Medium
Severe Weather: Extreme Heat	Significant	Highly Likely	Negligible	Low
Severe Weather: Freeze and Snow	Significant	Highly Likely	Limited	Low
Severe Weather: Fog and Freezing Fog	Limited	Occasional	Negligible	Low
Severe Weather: Heavy Rains and Storms (Thunderstorms/Hail, Lightning/Wind/Tornadoes)	Significant	Highly Likely	Limited	Medium
Soil Bank Erosion	Limited	Likely	Limited	Medium
Subsidence	Limited	Occasional	Critical	Medium
Wildfire	Extensive	Highly Likely	Catastrophic	High
Hazardous Materials Transport	Significant	Likely	Critical	High

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Probability of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance
Low: minimal potential impact
Medium: moderate potential impact
High: widespread potential impact

O.5 Vulnerability Assessment

The intent of this section is to assess the Agency's vulnerability separate from that of the planning area as a whole, which has already been assessed in Section 4.3 Vulnerability Assessment in the main plan. This

vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the main plan.

O.5.1. Assets at Risk

This section considers the Agency's assets at risk, specifically critical facilities and infrastructure, natural resources, and growth and development trends. Table O-4 lists particular critical facilities and other community assets identified by the Agency's planning team as important to protect in the event of a disaster. The Agency's physical assets consist of the flood control and local drainage structures and real property, the operations center, and equipment. Total values exceed $1.8 billion.

Table O-4 Placer County Water Agency's Critical Facilities, Infrastructure, and Other Agency Assets

Name of Asset	Address	Replacement Value	Hazard Info
Campus/Yard/Housing	Locations throughout Placer County	$30 million	Wildfire/earthquake
Water Treatment	Locations throughout Placer County	$250 million	Wildfire/earthquake/hazmat
Water distribution	Locations throughout Placer County	$320 million	Wildfire/earthquake/hazmat
Dams and diversions	Locations throughout Placer County	$502 million	Earthquake
Power generation	Locations throughout Placer County	$390 million	Storm/earthquake
Tunnels	Locations throughout Placer County	$335 million	Quake/subsidence

Source: PCWA

Natural Resources

The geographical boundaries of the PCWA are the same as those for the Placer County Planning Area. As such, the natural resources for Agency boundaries are the same as those identified for the entire planning area included in Section 4 of the main plan.

Growth and Development Trends

The geographical boundaries of the PCWA are the same as those for the Placer County Planning Area. As such, the Growth and Development Trends for Agency boundaries are the same as those for the entire planning area included in Section 4 of the main plan and within the jurisdictional annexes for the unincorporated communities.

Development since 2010 Plan

Development in the Agency service territory is the same as that of Placer County, as described in Section 4.3.1 of the base plan.

O.5.2. Estimating Potential Losses

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table O-3 as high or medium significance hazards. Impacts of past events and vulnerability of the Agency to specific hazards are further discussed below (see Section 4.1 Hazard Identification for more detailed information about these hazards and their impacts on the Placer County Planning Area). Methodologies for calculating loss estimates are the same as those described in Section 4.3 of the base plan. In general, the most vulnerable structures are those located within the floodplain, in the wildland urban interface, other priority hazard areas, unreinforced masonry buildings, and buildings built prior to the introduction of modern building codes.

An estimate of the vulnerability of the Agency to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Agricultural Hazards

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

While PCWA does not have any direct agricultural risk as far as crops, approximately 2/3 of the water supplied by the agency is used for agricultural and the Agency is highly involved with water conservation and planning for the agricultural Industry. About 11% of employment is attributed to Agriculture in Placer County, with marked growth in small farms and “farm to fork” operations. The loss of PCWA’s ability to provide water through our canal system would be devastating to agriculture in the County. The loss of Agriculture in the Western part of the County would equate to a significant revenue loss for the Agency.

Avalanche

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

The Power operations in the South Eastern part of the County are located in wilderness areas and most of the operations are at elevations between 2,000 and 5,000 feet. Assets and transportation routes can be profoundly impacted by snow and avalanche. While the Agency owns three snow-cats, safety and mobility can be significantly impacted by snow. This is further compounded by the remoteness of the area and spotty communications. This hazard may be a life safety and operational issue for staff, but is not likely to result in a long-term catastrophic loss to the Agency.

Dam Failure

Likelihood of Future Occurrence–Occasional
Vulnerability–High

Power has four dams and three diversions. A dam failure at the top of the Watershed theoretically could cascade through various facilities downstream causing additional loss or failures. Life safety concerns include gold claims and recreational use downstream, however immediate downstream exposure does not include populated residential areas and is often further reduced by adverse weather. Large property concerns include bridges close to the American River Confluence that could be effected. Folsom Lake would be effected proportionately. See Confidential Federal Energy Regulatory Commission (FERC) Emergency Action Plan (FERC Project No. 2079) for details. Dam failure could lead to a catastrophic operational loss for the agency.

Drought and Water Shortage

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Placer County Water Agency is fortunate to be at the top of the Watershed with plentiful water storage under normal circumstances. The historic drought between 2012 and 2015 resulted in minor reduction in supplies; however, the drought resulted in more significant demand reductions forced by regulatory mandates. In general, summer 2015 water use has been cut by over 30% relative to 2013 levels. Economically the drought has impacted water sales reducing revenues for the Agency. Prolonged drought can affect capital improvement plans and operations over time. Agriculture in the region is suffering a significant economic impact from reductions. The most significant threat to local economy is the concern of major populations not being adequately served from Folsom Lake due to the water surface going below the intake level. There was great risk of this occurring in both 2014 and 2015, but reservoir operations were modified just in time both years to prevent this crisis. The issue is complex statewide water management problem beyond the scope of just Placer County.

Earthquake

Likelihood of Future Occurrence–Occasional
Vulnerability–High

Earthquake could have a significate impact on underground drinking water and the fire hydrant supply lines. Additionally, the agency owns 165 miles of canal and flumes that supply water throughout the system. These could be disturbed by earth movement. While there is significant diversification and redundancy with (8) treatment plants, (16) pump stations and (27) storage tanks, the system does share some common threads and interties, but the system is basically designed to flow through descending elevations.

The Power Project area is not prone to earthquake, but earth movement from elevation, falling rock or slope failure remains concerning. These types of failures could be compounded by the volume of water in reservoirs, tunnels and penstocks.

Flood: 100/500 year and Localized Flooding

Likelihood of Future Occurrence–Occasional
Vulnerability–High

Placer County Water Agency does not handle storm water systems or reclaimed water. The storm exposures mainly arise from open water supply systems including canals and flumes. During major storm events water storage being released into the canal system is restricted and the agency opens spillway relief systems to allow for extra capacity. The main hazard that remains is debris swept into the canal system that potentially collects to block free flowing water. This can cause overtopping. Crews regularly patrol during storms to prevent debris build up at trash-racks and culverts.

The American River Pump Station has some degree of vulnerability during a 200 to 500 year storm due to its location along the Middle Fork of the American River.

The Power Project has potential storm exposure from over topping of dams at the top of the Middle Fork Project and to power plants along the river through descending elevations. Past forest fires compound watershed hazards with increased sedimentation causing water levels to rise. Additionally floating forest-fire debris can enter into the watershed and cause damage and potential destruction to dams, diversions and related facilities along the river.

Landslides and Debris Flows

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Landslide and debris flow hazards (not included in the Power System Project stated above under Flood or Earthquake Hazards) have not been specifically identified. The Water system does have ten smaller dams, reservoirs and levees. Many of the canal land and water easements are also located along slopes and in mountainous areas and are potentially susceptible to a damaging landslide event.

The Agency has identified several locations where rockfall is problematic and have installed deep anchors for slope stabilization and rockfall nets to protect critical equipment. An example is shown in Figure O-2.

Figure O-2 Rockfall Nets

Source: PCWA

Levee Failure

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Outside the six dams and diversions in the Power system, the Water System has four larger reservoirs/dams registered with the State, and six reservoirs with structures that are not registered because they are smaller. There have been no losses related to any of the Water-side reservoirs in corporate memory. The adjoining canals were designed to have spillways and reliefs built into the system.

Seiche (Lake Tsunami)

Likelihood of Future Occurrence–Unlikely
Vulnerability–Medium

On the East (top) side of Hell Hole and Lake Anderson there are steep slopes and some potential for earthquake activity, thus there is a seiche potential created by falling rock or subsiding land. This potential has not been realized in the past and has an unknown probability.

Severe Weather: Heavy Rains and Storms (Thunderstorms/Hail, Lightning/Wind/Tornadoes)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Heavy rain, thunderstorm activity, and hail usually occur on an annual basis in the Placer County Planning Area. Often during these events, the local stormwater drainage system can be impacted. Other Agency issues include potential damage to canal system. Storms in 1982, 1983, 1995, and 1997 caused damage to canals and some properties downhill from canals when debris caused canal overflows. Recent significant events include the heavy rains occurring during December 2005 and into January 2006. Agency assets incurred $140,000 in damage. Heavy rains impacted canal operations in 2008. On December 23rd, 2014 a single storm event in an otherwise dry year, caused canal over toppings with some adjacent private property damage from canal overflows. Damage to private property is not accurately tracked as it is considered "weather," and an "Act of God" in relation to insured values.

Soil Bank Erosion

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Soil bank erosion is a significant hazard in multiple areas. Much of the water conveyance system is built upon hillsides and slopes which can be prone to failure. A catastrophic example is the Bear River Canal failure April 19th of 2011 that affected PG&E, PCWA, and NID. About a 50-foot section of the 21-mile long canal fell off a steep hillside cutting off critical water supplies for both PCWA & NID. Secondary water supplies were trucked in from higher altitude reservoirs, and water was pumped from the American River to supplement the loss. Rolling outages were put into place for irrigation customers and a temporary by-pass was put into place roughly 38-days after the break. Service was restored aproximatly June 3rd of the same year. PCWA customers aided in the crisis by conserving water.

Soil Bank Erosion can also be a problem in the Power Project as the majority of access to the Project is logging or rural roads built on hillsides. These roads and other project embankments have failed in the past and generally causing operational challenges until repairs can be made. Most exposures have been considered major operational exposures, but not catastrophic losses.

Subsidence

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Subsidence for the PCWA can be compared to soil bank erosion hazard above.

Wildfire

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

The top of the water supply system is located in an area prone to wildfire. Assets include canals, flumes, treatment plants and water storage facilities. While flumes are typically "big timber" (see Figure O-3) they range in age and condition and could limit the flow of water through the water supply system. Emergency Services should give special consideration to water facilities because of the symbiotic working relationship. It is recommended that Emergency Services immediately work with the Agency during emergency situations.

Figure O-3 Traditional Big Timber Flume

Source: PCWA

The Power Project is located in a wilderness area that is prone to wild fire. Facilities have been intelligently planned and have survived multiple fires, but are still susceptible to damages that can be caused by wildfire. Primary weaknesses include access, communications and power lines. Dorms, housing and campgrounds/recreational facilities are also more likely to combust. Water resources are used to assist with firefighting where applicable. Contact the Agency for more information.

Hazardous Materials Transport

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

A substantial portion of the water delivery system is located within close proximity to the Union Pacific Rail System, the Kinder-Morgan Pipeline and a major Interstate Highway. PCWA assets within close proximity include canals, flumes, treatment plants and water storage, as population tends to follow the water and transportation systems. All of these assets are susceptible to pollutants and hazardous materials. On a smaller scale dilution may minimize a problem and there is reasonable redundancy and diversity built into the water supply system. However it is advised that Emergency Services immediately contact and

cooperate with PCWA staff to assure health and safety of the water supply in the event of a hazardous materials release to the environment.

O.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into four sections: regulatory mitigation capabilities; administrative and technical mitigation capabilities; fiscal mitigation capabilities; and mitigation education, outreach, and partnerships.

O.6.1. Regulatory Mitigation Capabilities

Table O-5 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the Agency.

Table O-5 Placer County Water Agency's Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	N	See Placer County.
Capital Improvements Plan	N	See Placer County.
Economic Development Plan	N	See Placer County.
Local Emergency Operations Plan	N	See Placer County.
Continuity of Operations Plan	N	See Placer County.
Transportation Plan	N	See Placer County.
Stormwater Management Plan/Program	N	See Placer County.
Engineering Studies for Streams	N	See Placer County.
Community Wildfire Protection Plan	N	See Placer County.
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y	
Building Code, Permitting, and Inspections	**Y/N**	**Are codes adequately enforced?**
Building Code	N	Version/Year:
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score:
Fire department ISO rating:	N	Rating:
Site plan review requirements	N	

Land Use Planning and Ordinances	Y/N	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	N	See Placer County
Subdivision ordinance	N	See Placer County
Floodplain ordinance	N	See Placer County
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	See Placer County
Flood insurance rate maps	N	See Placer County
Elevation Certificates	N	See Placer County
Acquisition of land for open space and public recreation uses	N	See Placer County
Erosion or sediment control program	N	See Placer County
Other		
How can these capabilities be expanded and improved to reduce risk?		

As indicated above, the Agency, in conjunction with Placer County, has several programs, plans, policies, and codes and ordinances that guide hazard mitigation. Some of these Agency-specific elements are described in more detail below.

Placer County Water Agency, Integrated Water Resources Plan, 2006

PWCA has a limited supply of water. Population growth has made it important to closely assess available water supplies and future demand. This document is an Integrated Water Resources Plan (IWRP) that presents a detailed assessment of the water supply and demand situation in Western Placer County. The intent of this IWRP is to plan the integration of the variety of available water supply resources to meet future water needs. Findings from this plan are used in the Agency's Urban Water Management Plan that was last updated in 2011 and will be updated again in 2016.

O.6.2. Administrative/Technical Mitigation Capabilities

The Agency is governed by a five-member Board of Directors, elected to four-year terms by voters residing within five geographical Agencies of Placer County. The Board of Directors meets twice monthly in regular session and holds special meetings as needed.

The Board employs a General Manager to administer all Agency activities, services and employment, and retains General Counsel to advise the Agency on legal and regulatory matters. The Agency staffs 215 full-time employees in total. About 73-employees work out of the Auburn Business Center. Departments include Administrative Services, Resource Development, Technical Services, Customer Services, and Financial Services. The Agency participates in the Placer County Local Hazard Mitigation Plan, the Placer County Emergency Operations Plan, and has a room set up to activate as an Agency Emergency Operation Center with radio, telecommunications, satellite phone service and A/V capabilities.

The Power Systems Office is located in Foresthill where operations are conducted for the Middle Fork Project. 32-employees manage the engineering, maintenance and operations of the hydro-electric system which includes 4 dams, 3 diversions, 5 powerhouses and associated tunnels, penstocks and facilities. There are up-to-date Emergency Management Plans, FERC Emergency Action Plans, and a FERC Security Plan for the operations.

Drinking Water Operations are coordinated from offices located on Ferguson Road, across from the Business Center but utilize various treatment plants and water storage facilities. Drinking Water Operations consists of 37-employees who are directly involved in the production and distribution of treated drinking water. A team of water plant operators coordinate operation of eight water treatment plants. Water quality personnel interpret public health laws, monitor water to ensure its safety, perform necessary reporting to the USEPA and California Department of Health Services. Water treatment plant maintenance personnel maintain and repair all the water quality facilities including the treatment plants, pump sites and well sites. Water distribution operators route water through pipeline systems and manage a network of tanks, pumps and pressure-control stations. Drinking Water Operations maintains the Hazardous Materials Business Plan.

Field Service has 54-employees who maintain 165-miles of canal and 602-miles of drinking water delivery systems. The Field corporate yard is located on Maidu Ave close to the edge of the American River Canyon. This yard houses the materials and heavy equipment required to maintain the water delivery systems.

Customer Services has a staff of 35-employees who provide a range of services including assisting the customer with all service related issues, service installations, new accounts, billing, payment processing, collections and water use efficiency. The department coordinates customer notifications during schedule maintenance projects and when water system emergencies arise (outages). Customer Services maintains an Agency Emergency Response Plan.

The meter services crew conducts the agency's meter reading, testing and replacement programs. Other activities include a cross-control program that prevents the reverse flow of water from private services back into the public water system and the constructed conveyance program that assists canal water customers in obtaining alternate water supplies for in-home use. Table O-6 identifies the personnel responsible for activities related to mitigation and loss prevention in the Agency.

Table O-6 Placer County Water Agency's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	See Placer County
Mitigation Planning Committee	N	See Placer County
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)		
Mutual aid agreements	Y	

Other		
Staff	**Y/N FT/PT**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	N	See Placer County
Floodplain Administrator	N	See Placer County
Emergency Manager	N	See Placer County
Community Planner	N	See Placer County
Civil Engineer	N	See Placer County
GIS Coordinator	N	See Placer County
Other	N	See Placer County
Technical	**Y/N**	**Describe capability Has capability been used to assess/mitigate risk in the past?**
Warning systems/services (Reverse 911, outdoor warning signals)	N	See Placer County
Hazard data and information	N	See Placer County
Grant writing	N	See Placer County
Hazus analysis	N	See Placer County
Other		
How can these capabilities be expanded and improved to reduce risk?		

O.6.3. Fiscal Mitigation Capabilities

Table O-7 identifies financial tools or resources that the Agency could potentially use to help fund mitigation activities.

Table O-7 Placer County Water Agency's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	
Authority to levy taxes for specific purposes	N	
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	N	
Storm water utility fee	Y	
Incur debt through general obligation bonds and/or special tax bonds	N	
Incur debt through private activities	N	

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Community Development Block Grant	N	
Other federal funding programs	N	
State funding programs	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		

O.6.4. Mitigation Outreach and Partnerships

Table O-8 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information. More information can be found below the table.

Table O-8 Placer County Water Agency's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	See items below this table.
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	See items below this table.
Natural disaster or safety related school programs	N	
StormReady certification	N	
Firewise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	Y	See items below this table.
Other	Y	See items below this table.
How can these capabilities be expanded and improved to reduce risk?		

PCWA has several partners in carrying out Agency objectives. These include:

Water Education Foundation – The Water Education Foundation is an impartial non-profit organization which develops and implements education programs leading to a broader understanding of water issues and to the resolution of water problems. The Agency supports the Foundation and its mission.

County of Placer – PCWA is a supporter of the Placer Legacy program. The Agency has been asked by the US Fish & Wildlife Service to participate in the development of a HCP/NCCP "Natural Communities Conservation Plan" in part to mitigate for the potential secondary impacts of the growth that could be enabled by the continued development of the Agency's existing water rights.

Sacramento River Watershed Program – The SRWP represents a wide coalition of stakeholders who care about the quality of the water and quality of life in the Sacramento River Watershed. Areas of emphasis include: monitoring toxic pollutants, public outreach and education, and biological and habitat preservation. The Agency is studying the feasibility of a Sacramento River diversion in exchange for an equal release of its water right water in the American River. The Agency's proposed Sacramento River diversion project would be consistent with the SRWP goals and objectives.

The United States Forest Service – Is a Federal Agency under the US Department of Agriculture responsible for administering National Forests and Grass Lands which include the Tahoe and El Dorado Forest. PCWA enjoys a strong relationship working alongside the Forest Service as our facilities and watersheds are intermingled.

The United States Bureau of Reclamation –Iis a Federal Agency under the US Department of the Interior which oversees water resource management specifically as it applies to the oversight and operation of diversion, delivery and storage and hydroelectric projects. The USBR still has an interest in the American River at the former site of the Auburn Dam.

The State Department of Parks & Recreation – Auburn State Recreation Area – The Auburn State Recreation Area is a part of the California Department of Parks and Recreation. They are responsible for the conservation and management of approximately 20-miles of park along the confluence of the American River.

Federal Energy Regulatory Commission (FERC) – Is an independent government agency that regulates the generation and transmission of energy, and more specifically licenses the Middle Fork Hydroelectric Project.

Pacific Gas & Electric Company (PG&E) – PG&E in a utility company delivering energy services to Northern and Central California. PG&E has multiple land, operational and watershed connections with PCWA.

Cal-Fire – Is a major incident management responder, providing varied emergency services. Cal-Fire has both State and Local responsibilities and is a primary responder to wildland fire in the Placer/El Dorado Area. PCWA has a working relationship with Cal-Fire that includes water and the sharing of with other Agency resources.

Protect American River Canyons (PARC) – PARC is a community-based non-profit organization located in Auburn that is dedicated to building American River community through collaboration and protection of

the natural, recreational and historical resources for the North and Middle Forks of the American River Watershed.

Department of Water Resources – DWR's mission is to manage the water resources in California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environment. PCWA coordinates with DWR on groundwater monitoring in west Placer County, interstate water resource negotiations regarding the Truckee River system, and on other regional issues.

Water Forum – The Water Forum was a collaborative process of a diverse group of business and agricultural leaders, citizens groups, environmental interests, water managers and local governments in Sacramento County, Placer County, and El Dorado County, with the co-equal objectives to (a) provide a reliable and safe water supply for the region's economic health and planned development to the year 2030, and (b) preserve the fishery, wildlife, recreational, and aesthetic values of the Lower American River. Implementation of the Water Forum Agreement will continue under the WF Successor Effort for many years.

Regional Water Authority – The RWA is a joint powers authority, formed to serve and represent regional water supply interests and to assist its members in protecting and enhancing the reliability, availability and quality of water resources. PCWA is a member and supporter of RWA.

City of Roseville – PCWA provides water from its Middle Fork American River Project (MFP) to the City. PCWA also has several interconnections between its treated water system and the cities that enable each to help the other in emergencies.

San Juan Water District – PCWA provides water from its MFP to the Agency to supply its customers within Placer County. PCWA also has several interconnections between its treated water system and the San Juan's that enable each to help the other in emergencies.

Nevada Irrigation District – NID and PCWA have common watershed and multiple interconnections that can be used to support water service.

O.6.5. Other Mitigation Efforts

The Agency is involved in a variety of mitigation activities including public outreach and project activities. These mitigation activities include:

- Public Service Advertisements
- Water Conservation (public outreach) program
- Website Newsletters to the general public

The Agency Water Conservation program includes residential programs and rebates for: high efficiency clothes washing machines, high efficiency toilets, hot-water recirculation systems, point of use hot water heater, new lawn replacement pilot program, free mulch distribution, and water wise house calls. Commercial programs include customer recognition for conservation (Flume Awards) and rebates including: high efficiency toilet rebate program, waterless urinal rebate program, water wise business calls

& large landscape irrigation survey for information on these and other programs customers may visit the PCWA Web site and visit the Customer Service section for the Water Use Efficiency pages at www.pcwa.net.

LL Anderson Dam Spill Way Modification

Placer County Water Agency Middle Fork Power Finance Authority completed a $200 million project to modify the spillway of the LL Anderson Dam. The widened spillway will safely pass the revised probable maximum flood determined by the US Army Corps of Engineers and increase operational flexibility. The French Meadows Reservoir (see picture) is a part of California's watershed management system that increases the capacity and consistency for the delivery of water for all downstream users. The dam spill way construction was completed in 2014

O.7 Mitigation Strategy

O.7.1. Mitigation Goals and Objectives

The Agency adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

O.7.2. Mitigation Actions

The planning team for the Agency identified and prioritized the following mitigation action based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, partners, potential funding, estimated cost, and schedule are included.

Action 1. Hillside Slope Stabilization

Hazard Addressed: Earthquake/Landslide-Debris

Issue/Background: The Middle Fork Power Operations are located in high country areas where mountain slopes and rock formations threaten various facilities and operations. Earth movement and gravitational forces can dislodge rock falls or shift penstocks.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCWA Capital Improvement Program (CIP)

Responsible Office: Placer County Water Agency

Priority (H, M, L): High

Cost Estimate: Over $1.5 million has been spent in slope stabilization, stability, and rock fall precautions over the past five-years. Another 750-thousand has been projected for stabilization projects moving forward through the next five years.

Benefits (Losses Avoided): Rock falls are hazardous employees working in the area and can disable power generation, transmission equipment and operations.

Potential Funding: HGMP, PDM, PCWA, MFPFA.

Schedule: Ongoing. Projects extending from 2011 through 2016 include Middle Fork penstock foundation monitoring, rock fall barriers on the Hell Hole Spillway Channel, and deep hillside stabilization and rock fall barriers above the Ralston Powerhouse.

Action 2. Water System Interties

Hazard Addressed: Drought/Earthquake/Landslide/Wild Fire/Hazardous Materials

Issue/Background: Interties create redundancy and reliability in the water supply. These water system interties are created both internally between PCWA systems, and created externally in cooperation with other water agencies, districts and suppliers.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCWA Capital Improvement Program (CIP) or Operations and Maintenance Funding (O&M)

Responsible Office: Placer County Water Agency and other local water providers.

Priority (H, M, L): High

Cost Estimate: Interties vary in cost depending on the proximity, size and complexity of construction.

Benefits (Losses Avoided): Increases redundancy in the water supply system allowing for transfer of water during critical times

Potential Funding: PCWA/NID/SJWD/Cities of Roseville, Lincoln Loomis and Rocklin

Schedule: Completed projects include the Barton Road Intertie between PCWA & SJWD, the Live Oak Intertie between PCWA and NID. The PG&E South Canal intertie with the Ophir Road Pump Station is anticipated in the near future and is currently in the design review process.

Action 3. Vegetation Management and Brushing

Hazard Addressed: Drought/Wildfire

Issue/Background: PCWA has significant land holdings as necessitated by the distribution of water throughout the County. A drought and wild fire become inextricable tied it is important to maintain land responsibly in an attempt to lessen the likelihood of wildfire.

The Agency uses various methods of maintaining land including goats and sheep for grass work, California Department of Corrections and Rehabilitation (CDCR) hand crews, and Agency weed and brush crews. We attempt to cooperate with neighboring land owners with tree work and have an on-call arborist contract to assist with forestry.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCWA Capital Improvement Program (CIP) or Operations and Maintenance Funding (O&M)

Responsible Office: Placer County Water Agency and adjacent land owners.

Priority (H, M, L): High

Cost Estimate: Costs vary with method and degree of application.

Benefits (Losses Avoided): Reduces the opportunity for, and magnitude of, wildfire while increasing the accessibility to water assets.

Potential Funding: PCWA

Schedule: Ongoing

Action 4. Enhance Canals by Converting Earthen Canals to Gunite-Lined Canals in Critical Areas.

Hazard Addressed: Drought/Landslide-Debris/Hazardous Materials/Wild Fire.

Issue/Background: Gunite-lined canals offer advantages for Drought, Landslide, Wild Fire and the potential for limiting Hazardous Material incidents. During Drought, the gunite lining reduces water loss through seepage that occurs in earthen canals. Lined canals also are less likely to slide because of erosion or failure, and there is a permanent structure in place that has increased potential to be recovered if a landslide occurs. Cal-Fire and most rural Fire Departments depend on canal systems operated by either public or private entities to be a source of water for firefighting. This includes water pumped directly from the canal and canal water fed into water systems that provide hydrant connections for communities. In the event of a Hazardous Materials spill, the gunite lining works well for both chemical containment and diking and makes clean up and restoration much more plausible.

Other Alternatives: Buried pipe where practical, or no action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCWA Capital Improvement Program (CIP) or Operations and Maintenance Funding (O&M)

Responsible Office: Placer County Water Agency, and other canal operators

Priority (H, M, L): High

Cost Estimate: $500,000 per year on average

Benefits (Losses Avoided): Improves reliability of canal systems by saving water, making clean water available and fortifying the integrity and structure of the canal.

Potential Funding: HGMP, PDM, FEMA, PG&E, PCWA, others

Schedule: Historically the Agency has an on-call gunite contract and we continually improve canals based upon need. Typically out of the 165-miles of canal we are able to gunite a little less than 5-miles per year on average. The budget for gunite is a variable cost and the last few years' projects have been reduced due to drought and decreased funding from water sales. Enclosing canals by burying pipe is typically prohibitive in cost, however new construction and some replacement is done with buried pipe as a preferable alternative. Commercial development standards require canal encasement in many situations. The Agency also provides design specifications and the engineering department will work to assist private parties who desire to encase canals crossing their land.

Future plans are consistent with past practice and it is predicted that the application of gunite will continue at the same rate.

Action 5. Replace Wooden Flume Structures

Hazards Addressed: Wildfire/Drought

Issue/Background: Historically flumes allow a gravity flow canal system to cross canyons, valleys and other low spots; aligning the canals up as to maintain the elevation and flow. Currently there are twenty-eight flumes with twenty-five of them above the Auburn water system. Many of these flumes are integral to the supply system. The support structures for flumes are typically made of large wood members (4X4"s or larger) and the chute is frequently wood lined with tin. Wooden structures are vulnerable to wild fires. Changing flumes to in-ground pipe would also be considered a drought water conservation method. While the Agency would like to enhance and enclose many of the flumes, it is likely that they will exist well into the future due to a community fondness for the structures, engineering challenges, and increased construction cost for improvement.

Other Alternatives: Enclose and bury pipe, use modern fire resistant steel or concrete construction, or take no action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCWA Capital Improvement Program (CIP) or Operations and Maintenance Funding (O&M)

Responsible Office: Placer County Water Agency

Priority (H, M, L): Medium

Cost Estimate: Current "like" replacement values from $50,000 to $150,000 per flume. Modernization may be five to ten times the replacement value. There is approximately $1M budgeted for 2016.

Benefits (Losses Avoided): Enclosed and buried pipe would not be as vulnerable to fire or weather. Reduced vulnerability assures access to water supporting public safety and the consistency of the general water supply.

Potential Funding: HGMP, PDM, FEMA, PCWA.

Schedule: Ongoing analysis and improvement where warranted. The Upper Fiddler Green, Turner, Alpine, Lang #1 & #2, Spikes, Cherry Tree and Secret Town flumes have been replaced by a pipe. The Hayford Flume is planned for 2016 reconstruction. The Long Ravine pipeline is also scheduled and will remain encased.

Action 6. De-Silt Reservoirs.

Hazards Addressed: Dam Failure/Drought/Landslide-Debris

Issue/Background: Reservoirs are raw water storage areas and are used to regulate the flow of water in canals for treated water production, agriculture use, power generation, and as a source of water for fire suppression.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCWA Capital Improvement Program (CIP) or Operations and Maintenance Funding (O&M)

Responsible Office: Placer County Water Agency and private property owners.

Priority (H, M, L): Low for Water Operations, Currently High in Power Operations

Cost Estimate: Estimate from $200-thousand to $4.6 million depending on size and amount of silt in reservoir.

Benefits (Losses Avoided): Silt and other debris continually accumulate in canals and waterways which ultimately get deposited into reservoirs. As silt levels increase over the years, it decreases storage capacity in the reservoir. Periodic de-silting improves capacity and operational value of the reservoirs as well as frequently restoring environmental health to the body of water.

Potential Funding: HGMP, PDM, PCWA.

Schedule: Ongoing. Priority for desilting projects leans toward the Middle Fork Project where fire and subsequent erosion has created a problem that may span decades of impact upon the operation of the project.

Sediment monitoring is being performed, but Emergency Debris Management for the Ralston Afterbay is a priority. This project includes the removal of large floating debris including trees, root wads and limbs that may impact the ability to control flow or threaten the dam.

The goal of desilting of smaller holding ponds and reservoirs on the canal system have been unobtainable because of the priority of protecting the dams, as well as environmental and logistical challenges for de-silting, and the ultimate cost of performing the work.