

ORANGE COUNTY WATER DISTRICT ANNEX

The Orange County Water District (OCWD) is a participant (Member Agency [MA]) in the Orange County Water and Wastewater Multi-Jurisdictional Hazard Mitigation Plan (HMP or Plan). As a participant MA, OCWD representatives were part of the HMP Planning Process and served on the Planning Team responsible for the Plan Update; refer to Section 2 of the Plan. The primary Plan, including the hazard mitigation plan procedural requirements and planning process apply to OCWD.

This Annex supplements information contained in the primary Plan and describes how OCWD’s risks vary from the planning area. The Risk Assessment (Section 3) summarizes the hazards and risks that pose a threat to Orange County. The primary Plan treats the entire County as the planning area and identifies which MAs are subject to a profiled hazard. The purpose of this Annex is to provide additional information specific to OCWD with a focus on the risk assessment and mitigation strategy.

HAZARD MITIGATION PLAN POINT OF CONTACT AND DEVELOPMENT TEAM

The following representatives attended the Planning Team meetings on behalf of OCWD and coordinated the hazard mitigation planning efforts with OCWD staff:

Primary Point of Contact

Paula Bouyounes
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Alternate Point of Contact

Bill Hunt
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In addition to participating on the Planning Team, an internal team was also formed to support Planning Team representatives and provide information for the Plan update. The following staff served as OCWD’s internal hazard mitigation planning development team.

Representative	Title	How Participated
Bill Hunt	Director of Special Projects	Goals/Project Chart
Chris Olsen	Director of Engineering	Capability Assessment / Project Chart
Randy Fick	CFO	Infrastructure / Capability
Mehul Patel	Director of Water Production	Infrastructure

JURISDICTION PROFILE (Service Population: 2.4 million)

OCWD manages the large groundwater basin that provides reliable, high-quality groundwater to 19 cities and water utilities and their 2.4 million customers. OCWD was formed in 1933 by a special act of the California Legislature [Water Code App §40-1 *et seq.*], which authorized OCWD to represent water users and landowners in litigation (with upstream users) and empowered OCWD to protect the water supply and protect the groundwater basin. The mission of OCWD is to provide local water retailers with a reliable, adequate, high-quality water supply at the lowest reasonable cost in an environmentally responsible manner. With years of proper planning and investment, OCWD has more than doubled the output of the groundwater basin. Today, OCWD is managed by a ten-member Board of Directors, with three appointed from the cities of Anaheim, Fullerton and Santa Ana, and the remainder of the Board publicly elected from geographic divisions within the OCWD service area.

The groundwater basin, which underlies north and central Orange County, provides between 65 and 75 percent of the water needed in that area. Imported water meets the balance of the water demand. Groundwater is pumped by water utilities before being delivered to customers. Groundwater is a great value at approximately one-half the cost of imported water. OCWD purchases through MWDOC some imported water supplies for recharge operations and for operating and maintaining the seawater intrusion barrier.

OCWD is known internationally for its “tradition of innovation.” OCWD built the first advanced wastewater purification plant to provide water to prevent seawater intrusion into Orange County’s groundwater basin. Today, OCWD and OCSD are partners in the world’s largest advanced wastewater purification project, called the Groundwater Replenishment System (GWRS) that is currently being expanded to provide 134,000 acre-feet per year (AF/yr) of water for seawater barrier and groundwater replenishment purposes.

One of OCWD’s core activities is refilling or replenishing the Basin to balance the removal of groundwater by pumping. Sources of recharge water include Santa Ana River baseflow and storm flow, Santiago Creek flows, imported supplies purchased from Metropolitan, supplemental supplies from the upper Santa Ana River Watershed, and purified wastewater from the GWRS plant. OCWD works closely with the U.S. Army Corps of Engineers, which operates Prado Dam on the Santa Ana River in Riverside County, to conserve storm water on lands behind the dam for use in OCWD’s recharge efforts. The Basin is not operated on an annual safe-yield basis, which means the water withdrawn may exceed replenishment in any given year; however, over the long term, the Basin must be maintained in an approximate balance to ensure long-term viability.

HAZARDS

Detailed hazard profiles for the planning area are provided in Section 3. OCWD’s service area includes most of Orange County and its exposure to hazards reflects the same countywide scope presented in Section 3. There are no hazards that are unique to OCWD.

Based on the risk assessment, the OCWD development team identified the following hazards that affect OCWD and summarized their geographic extent, probability of future occurrence, magnitude/severity and significance; refer to Table B-1.

**Table B-1
OCWD Hazard Identification**

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Significance
Climate Change	Extensive	Unlikely	Negligible	Low
Coastal Storms/Erosion	Limited	Occasional	Limited	Low
Contamination/Salt Water Intrusion	Limited	Likely	Critical	High
Prado Dam Failure	Extensive	Unlikely	Catastrophic	High
Drought	Extensive	HL	Limited	Medium
Earthquake Fault Rupture & Seismic Hazards	Extensive	Likely	Catastrophic	High
Flood	Extensive	Occasional	Critical	High
Geologic Hazards (liquefaction)	Extensive	Occasional	Critical	High
High Winds/Santa Ana Winds	Extensive	Likely	Limited	Medium
Landslide/Mudflow	Limited	Unlikely	Negligible	Low
Wildland/Urban Fire	Limited	Occasional	Limited	Medium
Human-Caused Hazards	Extensive	Likely	Limited	Medium
Power Outage	Extensive	Likely	Limited	Low
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area		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.		
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.		Significance Low: Minimal potential impact Medium: Moderate potential impact High: Widespread potential impact		

The identification of hazards provided in Table B-1 is highly dependent on the location of facilities within each agencies jurisdiction and takes into consideration the history of the hazard and associated damage (if any), information provided by agencies specializing in a specific hazard (e.g., FEMA, California Geological Survey), and relies upon each agencies’ expertise and knowledge.

Hazard Maps

The following maps show the location of hazard zones within the jurisdiction relative to potable water systems, as applicable.

VULNERABILITY AND RISK ASSESSMENT

Assets Susceptible to Hazard Events

Table B-2, OCWD Facilities/Infrastructure and Exposure to Hazards, identifies OCWD’s facilities and water infrastructure assets that are located within the mapped hazard zones, identified above.

**Table B-2
OCWD Facilities/Infrastructure and Exposure to Hazards**

Hazard		Buildings	Infrastructure					
		Administration Buildings (#)	Pump Stations (#)	Reservoirs (#)	Water Storage Tanks (#)	Water Treatment Plants (#)	Potable Pipeline (miles)	Wastewater Pipeline (miles)
Fire Hazard Zone	Moderate	0	0	1	0	0	0	0
	High	0	0	0	0	0	0	0
	Very High	0	0	0	0	0	0	0
FEMA Flood Zone	100-Year	0	0	15	0	0	11.6	0
	500-Year	0	0	0	0	0	0.4	0
Alquist-Priolo Rupture Zone		0	0	0	0	0	0	0
Ground Shaking	Moderate	0	0	0	0	0	0	0
	High	1	1	1	1	1	12.1	0
	Extreme	1	1	17	0	0	5.7	0
Liquefaction	Moderate	0	0	2	0	0	3.8	0
	High	2	2	14	1	1	13.4	0
	Very High	0	0	0	0	0	0	0.8
	Unknown	0	0	0	0	0	0.1	2.5
Landslide Zone		0	0	0	0	0	0	0
Tsunami Zone		0	0	0	0	0	0	0

Several miles of the district’s potable pipeline system and reservoirs are in areas susceptible to flooding and within an area identified as having a high or extreme risk for ground shaking and high risk of liquefaction during an earthquake.

CAPABILITIES ASSESSMENT

The capabilities assessment is designed to identify existing local agencies, personnel, planning tools, public policy and programs, technology, and funds that have the capability to support hazard mitigation activities and strategies outlined in this Plan. The OCWD internal development team revised the capabilities identified in the 2012 plan and collaborated to identify current local capabilities and mechanisms available to the MA for reducing damage from future hazard events. Tables B-3a through B-3d, assess the authorities, policies, programs, and resources that the jurisdiction has in place that are available to help with the long-term reduction of risk through mitigation. These capabilities include planning and regulatory tools,

administrative and technical resources, financial resources, and education and outreach programs. The agency has the ability to create or expand existing policies and programs to implement mitigation programs.

**Table B-3a
Planning and Regulatory Capabilities Summary**

Ordinance, Plan, Policy, Program	Responsible Agency or Department	Description/Comments
Building Code	Engineering Department; OCWD	OCWD complies with applicable building codes and works with the cities within the District service area.
Zoning Ordinance	City/County	OCWD complies with applicable zoning ordinances and works with the cities within the District service area.
Subdivision Ordinance or Regulations	City/County	OCWD complies with applicable subdivision ordinance or regulations, and works with the cities within the District service area.
Special Purpose Ordinance	City/County	OCWD complies with applicable special purpose ordinances, and works with the cities within the District service area.
Growth Management Ordinances	City/County	OCWD complies with applicable growth management ordinances, and works with the cities within the District service area.
Site Plan Review Requirements	City/County	OCWD complies with applicable site plan review requirements, and works with the cities within the District service area.
General Plan	City/County	OCWD complies with the applicable General Plans, and works with the cities within the District service area.
Capital Improvements Plan	Engineering, Hydrogeology, Field Headquarters	Construction Projects, Well Construction, Infrastructure Improvement Projects. Annual Board approval.
Emergency Response Plan	Risk & Safety; OCWD	Maintains Emergency Response Plan.
Post-Disaster Recovery Plan	Risk & Safety; OCWD	Business Continuity Plan; Partial recovery information in the Emergency Response Plan.
Water Discharge Requirements	Regional Water Quality Control Board (RWQCB); Regulatory Affairs; Water Quality & Technical Resources, Water Production	Permits related to GWRS and Green Acres Operations; RWQCB.

**Table B-3b
Administrative and Technical Capabilities Summary**

Staff/Personnel or Type of Resource	Responsible Agency or Department	Description/Comments
Planner(s) or Engineer(s) with Knowledge of Land Development and Land Management Practices	Planning & Natural Resources and Property Management; OCWD	Environmental Planners with expertise in land development practices. Collaborate with Engineering and cities to comply with all requirements.
Engineer(s) or Professional(s) Trained in Construction Practices Related to Buildings and/or Infrastructure	Engineering Department; OCWD	Licensed Civil Engineers and certified building evaluators (Safety Assessment Program certified by Cal OES). Evaluators certification through 2019.
Planners or Engineer(s) with an Understanding of Natural and/or Human - Caused Hazards	Engineering, Planning & Natural Resources and Risk & Safety	Regional General Plan (RGP).
Surveyors	Engineering; OCWD	GPS Surveying Capabilities.
Staff with Education or Expertise to Assess the Community's Vulnerability to Hazards	Risk & Safety; OCWD, WEROC	Cal ARP Tank Assessment.
Personnel Skilled in GIS and/or HAZUS	Hydrogeology	Dedicated GIS staff.
Emergency Manager	Risk & Safety; OCWD	Prepare, implement and provide emergency training to staff. Trained personnel in the following: Emergency Response Team; Confined Space Rescue Team; HAZMAT.
Grant Writers	Engineering Department; OCWD, Planning Department	Prepared, submitted, and received several grants for various projects. Includes but not limited to Proposition 1, Proposition 84, Measure M.
Water Quality Lab	Water Quality	Collects and analyze water samples from ground water wells on routine basis. Samples include ground water; Surface water, treatment plant.

**Table B-3c
Financial Capabilities Summary**

Financial Resources	Agency or Department	Description/Comments
Capital Improvements Project Funding	Engineering and Finance Departments; OCWD	Prepared, submitted, and received funding for various construction projects. Includes but not limited to State Revolving Fund Loan.
Fees for Water, Sewer, Gas, or Electric Service	Finance Department; OCWD	Charge producers for recycled and ground water.
Incur Debt Through Special Tax and Revenue Bonds	Finance Department; OCWD	Use revenue refunding bonds to refinance existing debt.

**Table B-3d
Education and Outreach Capability Summary**

Resource/Programs	Agency or Department	Description/Comments
Agency website	Administration Staff, Public Affairs	The district informs residents of special events, emergency information, and news.
Twitter	Administration Staff, Public Affairs	The district informs residents of special events, emergency information, and news.
Great ShakeOut	Risk & Safety and Public Affairs Department; OCWD	Participation in the annual drill, training and social media.
Children’s Water Festival	Public Affairs; OCWD	Educational programs include seismology booth.
Water Emergency Response Organization of Orange County (WEROC)	Risk & Safety and Public Affairs Department; OCWD	Participation in WEROC.
Public Agency Safety Management Association (PASMA) and Red Cross Disaster Program/Conference	Risk & Safety Department; OCWD	PASMA and Red Cross emergency training and Conferences.
Workplace Violence Program	Risk & Safety Department; OCWD	Education and training provided to OCWD staff.

MITIGATION STRATEGY

Mitigation Goals

OCWD adopts the hazard mitigation goals developed by the Planning Team; refer to Section 4.

Mitigation Actions

The internal development team reviewed the mitigation actions identified in the 2012 plan and the updated risk assessment to determine if the mitigation actions were completed, require modification, should be removed because they are no longer relevant, and/or should remain in the Plan Update. New mitigation actions to address the updated risk assessment and capabilities identified above were also considered and added. Table B-4, OCWD Mitigation Actions, identifies the mitigation actions, including the priority, hazard addressed, risk, timeframe, and potential funding sources.

**Table B-4
OCWD Mitigation Actions**

Priority (High, Medium, or Low)	Action/Task/Project Description	Location/Facility	Risk (High, Medium, or Low)	Cost	Timeframe (Immediate, Short Term, or Long Term)	Possible Funding Sources	Status/Progress (New, Existing, Modified)	Status Rationale
Medium	Seismic structure assessment for Administration Building.	Administration building in Fountain Valley.	Low	\$40,000	Short Term	General Fund	Modified	Need to hire consultant to assist with assessment.
Medium	Seismic structure assessment for Field Headquarters (FHQ) Building.	FHQ building in Anaheim.	Low	\$20,000	Short Term	General Fund	New	Need to hire consultant to assist with assessment.
High	Stream bank erosion threatening Villa Park Road in Santiago reservoirs' Smith pit.	Smith pit in Orange/Villa Park.	Medium	\$4 M	Short Term	General Fund	New	In design phase.
Medium	Completion of the Santiago saddle repair following the 2010 storms.	Santiago basin in Orange/Villa Park.	Low	\$5 M	Long Term	FEMA	New	Scheduled for summer of 2019.
Medium	Construct fencing on all sites. Ensure regular maintenance.	All Locations	Medium	\$25,000	Immediate	General Fund	New	Security is a constant issue.
Medium	Update SCADA System to ensure anomalies in the water system are detected.	All Locations	Low	\$50,000	Short Term	General Fund	New	Contamination can occur from manmade or natural hazards.
High	Upgrade pipeline along Ellis to seismic standards.	Fountain Valley	Medium	\$6 M	Long Term	General Fund	New	Current pipelines have reached end of life.
Medium	Enforce sea water barrier	All locations	Medium	\$5 M	Long Term	General Fund	New	Protect against saltwater intrusion.
Medium	Monitor Prado Dam run off. Ensure maintenance is completed after each rainstorm.	Prado Dam	Medium	\$10,000	Short Term	General Fund	New	Can cause damage if water isn't properly diverted.

Notes:

Timeframe to Completion of Project: "Immediate" is up to 1 year; "Short Term" is 1 to 3 years; "Long Term" is 3 years or longer.

Status: "New" refers to a mitigation initiative newly created as part of the plan update process; "Existing" refers to an unfinished initiative that is carried over from the 2012 plan; "Modified" refers to an existing initiative that carried over from the previous plan, but has changed to limit or expand its scope of activities.

Status Rationale: A statement of justification as to why the project is currently in the status it is in.

Completed or Removed Mitigation Initiatives

The following mitigation actions from the 2012 plan have been completed and therefore are removed from the Plan update.

Mitigation: Reconstruction/maintenance of levees & diversion structure in Prado Wetlands.

Status: Complete.

Mitigation: Acquire mobile emergency power generator system.

Status: No longer needed because of back-up power supply.

PLAN INTEGRATION

OCWD's Capital Improvement Program is used to implement mitigation initiatives identified in this annex. After adoption of the HMP, the District will continue to integrate mitigation priorities into these documents.

The OCWD Capital Improvement Program (CIP) Projects have the following progression of stages.

- A project is budgeted and included in the fiscal year CIP budget.
- A feasibility study is prepared which describes the project with potential alternatives, a cost estimate and schedule.
- Once approved by our Board of Directors, an Engineer's Report and the environmental documentation is prepared.
- Upon approval, a design services request for proposals is advertised, an agreement awarded for design services, and project plans and specifications prepared.
- The construction project is publicly advertised, awarded and the construction activities performed to completion.