

SERRANO WATER DISTRICT ANNEX

The Serrano Water District (Serrano) 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, Serrano 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 Serrano.

This Annex supplements information contained in the primary Plan and describes how Serrano’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 Serrano 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 **Serrano** and coordinated the hazard mitigation planning efforts with **Serrano** staff:

Primary Point of Contact

Jerry Vilander
 General Manager
 jerryv@serranowater.org
 714-538-0079

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 Serrano’s internal hazard mitigation planning development team.

Representative	Title	How Participated
Steve Sweeney	System Operator II	Data gathering; plan review

JURISDICTION PROFILE (Service Population: 6,500)

Serrano was formed in 1927 under the California Water Code and serves a population of 6,500 in the City of Villa Park and a small portion of the City of Orange. Serrano is an independent governmental body with an elected Board of Directors. It is separate and distinct from the City of Villa Park’s Municipal Government. Serrano receives its water supply mostly from local surface water, which is stored in Santiago Reservoir (Irvine Lake), and groundwater from three wells located within the City of Villa Park. Annually, Serrano provides about 3,000 acre-feet of water serving primarily large lot single family homes and one shopping center. About once every 10 years, Serrano supplements its local water supply with raw imported water from Metropolitan through MWDOC.

Serrano owns a percentage of the capacity of Irvine Lake and the dam forming the lake; Irvine Ranch Water District (IRWD) owns the balance. The annual operation of Irvine Lake varies depending on the amount of local runoff.

The water Serrano receives out of Irvine Lake can be either locally generated runoff, imported water, or some combination thereof. Water is supplied from Irvine Lake to the Serrano treatment plant, located about 1.5 miles away, through a 24-inch gravity flow supply line that has a capacity of about 17 cubic feet per second (cfs). Serrano's existing water treatment plant can produce about 3,000 gallons per minute (gpm) and its wells can produce about 4,000 gpm for a peak supply of about 7,000 gpm. In recent years, Serrano has been using their treatment plant to supply 1,000 to 1,500 acre-feet of water to the City of Orange through interconnections.

HAZARDS

Detailed hazard profiles for the planning area are provided in Section 3. Serrano is located inland and therefore is not subject to coastal hazards, such as coastal storms/erosion and tsunamis. However, Serrano is subject to most of the other hazards identified for the planning area. Many of these hazards are dispersed and may affect the entire region, including climate change, drought, ground shaking from earthquakes, geologic hazards, and high wind. The District owns and operates one dam: Santiago Dam/Reservoir (Irvine Lake) and would be subject to inundation in the event of a failure; refer to Section 3. Human-caused hazards and power outages are also hazards that could impact the District. There are no hazards that are unique to Serrano.

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

**Table O-1
Serrano Hazard Identification**

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Significance
Climate Change	Limited	Occasional	Negligible	Low
Contamination/ Salt Water Intrusion	Limited	Unlikely	Critical	Medium
Dam/Reservoir Failure	Limited	Unlikely	Catastrophic	High
Drought	Extensive	Likely	Critical	Medium
Earthquake Fault Rupture & Seismic Hazards	Significant	Occasional	Critical	Medium
Flood	Limited	Unlikely	Limited	Low
Geologic Hazards	Limited	Unlikely	Limited	Low
High Winds/ Santa Ana Winds	Significant	Likely	Limited	Medium
Landslide/Mudflow	Limited	Unlikely	Limited	Low
Wildland/Urban Fire	Limited	Occasional	Limited	Medium
Human-Caused Hazards	Limited	Occasional	Limited	Medium
Power Outage	Limited	Likely	Limited	Medium
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 O-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 O-2, Serrano Infrastructure and Exposure to Hazards, identifies Serrano’s water and wastewater infrastructure assets that are located within the mapped hazard zones, identified above.

**Table O-2
Serrano Infrastructure and Exposure to Hazards**

Hazard		Infrastructure Type				
		Pump Stations (#)	Treatment Plants (#)	Reservoirs (#)	Wells (#)	Potable Pipeline (miles)
Fire Hazard Zone	Moderate	0	0	0	0	1.5
	High	0	0	0	1	2.5
	Very High	0	1	1	0	2.8
FEMA Flood Zone	100-Year	0	0	0	0	4.9
	500-Year	0	0	0	2	0.5
Alquist-Priolo Rupture Zone		0	0	0	0	0
Ground Shaking	Moderate	0	0	0	0	0
	High	1	0	1	3	3.3
	Extreme	0	1	1	0	5.3
Liquefaction	Moderate	0	1	0	1	4.7
	High	0	0	0	0	1.4
	Very High	0	0	0	0	0
	Unknown	0	0	0	0	0.4
Landslide Zone		0	0	0	0	0
Tsunami Zone		0	0	0	0	0

A treatment plant and reservoir, as well as potable pipeline are located within a very high fire hazard zone area. Several miles of potable pipeline and two wells are also located in the 100-year FEMA flood zone. The District’s service area, including several miles of potable pipeline, a pump station, treatment plant, reservoir and wells, are located within areas identified as having high and extreme ground shaking susceptibility in the event of an earthquake. Serrano has infrastructure or pipelines in all hazard areas, except the Alquist-Priolo Rupture, landslide, and tsunami zones.

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. Serrano’s 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 O-3a through O-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 O-3a
Planning and Regulatory Capabilities Summary**

Ordinance, Plan, Policy, Program	Responsible Agency or Department	Description/Comments
Building Code	City of Villa Park/City of Orange	SWD complies with applicable building codes and works with cities within the District service areas.
Zoning Ordinance	City of Villa Park/City of Orange	SWD complies with applicable zoning codes and works with cities within the District service areas.
Subdivision Ordinance or Regulations	City of Villa Park/City of Orange	SWD complies with subdivision ordinances and regulations, and works with cities within the District service areas.
Special Purpose Ordinance	City of Villa Park/City of Orange	SWD complies with special purpose ordinances, and works with cities within the District service areas.
Growth Management Ordinances	City of Villa Park/City of Orange	SWD complies with growth management ordinances, and works with cities within the District service areas.
Site Plan Review Requirements	SWD looks at this for placement of gutter	As needed.
General Plan	City of Villa Park/City of Orange	City.
Capital Improvements Plan	SWD	As needed.
Economic Development Plan	City of Villa Park/City of Orange	Unsure/Unknown.
Emergency Response Plan		Plan required from Board, continual update.

**Table O-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	City and SWD (additional staff would be hired on as needed contract)	Serrano does not have in-house engineers- all engineer work hired as needed; work with MWPOC staff on regional level.
Engineer(s) or Professional(s) Trained in Construction Practices Related to Buildings and/or Infrastructure	City and SWD (additional staff would be hired on as needed contract)	Serrano does not have in-house engineers- all engineer work hired as needed; work with MWPOC staff on regional level.
Planners or Engineer(s) with an Understanding of Natural and/or Human - Caused Hazards	City of Villa Park and City of Orange	City, county, and agency has planners with expertise in land development practices.
Staff with Education or Expertise to Assess the Community's Vulnerability to Hazards	SWD	Staff attend hazard mitigation meetings and expect additional training; attend training.
Emergency Manager	Management	General Manager of SWD.
Grant Writers	Consultant	Serrano Water District Outsource.

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

Financial Resources	Agency or Department	Description/Comments
Capital Improvements Project Funding	Serrano Water District/Engineering Department	Annual review of capital requirements and forecasting future cap needs.
Authority to Levy Taxes for Specific Purposes	Serrano Water District/Administrations	The district typically levies taxes for 1) special assessment tax obligation debt service and 2) general obligation debt service payments.
Fees for Water, Sewer, Gas, or Electric Service	Set rates SWD	The district, through the Prop 218 process, is able to charge customers fees for water and sewer services.
Impact Fees for Homebuyers or Developers for New Developments/Homes	SWD + City	Through a general election, the district can incur debt through general obligation bonds.
Incur Debt Through General Obligation Bonds	Serrano Water District/ Administration and Board of Directors	The district may incur special tax or revenue bonds as needed through the appropriate legal process.

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

Resource/Programs	Agency or Department	Description/Comments
Various; as needed	Pringle Associates	Information outreach is conducted for specific programs or projects as necessary.
Newsletter	Serrano Water District	The District publishes a newsletter to provide information to its customers.
Press Release	Serrano Water District	Press releases are used to inform customers of essential information.
Brochures	Serrano Water District	Brochures are used to inform and educate customers on specific water topics.
Website	Serrano Water District	The District's website is updated regularly and used to provide information.
Town Hall Meetings	Serrano Water District	Meetings held to discuss important water topics affecting customers, such as drought.

MITIGATION STRATEGY

Mitigation Goals

Serrano 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 O-4, Serrano Mitigation Actions, identifies the mitigation actions, including the priority, hazard addressed, risk, timeframe, and potential funding sources.

**Table O-4
Serrano 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
Flood								
High	Protect facilities within flood plain areas.	Irvine Lake	High	Unknown	Long Term	Budget	Existing	Reevaluating protection measures
High	Place protective measures in rivers and creeks or relocate facilities out of harm's way.	Irvine Lake	High	\$15 mil	Long Term	Budget	Existing	Reevaluating protection measures
Earthquake								
Medium	Secure above ground assets in all buildings, booster stations, reservoirs, pressure reducing stations, emergency interties, water systems, water reclamation plant, lift stations, pipelines and bridge crossings.	All Facilities	High	\$30 mil	Long-Term	Capital Improvement Fund	Existing	Evaluate facilities as they need other work
Low	Install joistless pipelines in all creek crossings.	Creek Crossings	High	\$5 mil	Long Term	Budget	Existing	Creating a prioritization list for installation
Medium	Improve structural characteristics of reservoirs and pump stations; consider flexible connections at reservoirs for seismic activity.	All Facilities	High	\$7 mil	Long Term	Budget	Existing	Evaluating what components need improvement
Human Caused								
Low	Identify all major fuel pipelines, rail transportation corridors, manufacturing facilities, and their vulnerability relative to hazardous material releases.	All Facilities	Low	\$20k	Long Term	Budget	Existing	Evaluate facilities as they need other work
Wild Fire								
Medium	Develop a comprehensive approach to reducing the possibility of damage and losses due to structural fire/wildfire.	Urban/Wildland Interface	High	\$3 mil	Long Term	Budget	Existing	This project will be addressed as time allows
Medium	Create a fire management plan outlining various impacted facilities and vulnerabilities.	Urban/Wildland Interface	High	\$30k	Long Term	Budget	Existing	This project will be addressed as time allows

**Table O-4 [continued]
Serrano 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
Low	Share all infrastructures/building information with local, county, and state fire agencies.	Urban/Wildland Interface	High	\$20k	Long Term	Budget	Existing	This project will be addressed as time allows
<p>Notes:</p> <p><u>Timeframe to Completion of Project:</u> "Immediate" is up to 1 year; "Short Term" is 1 to 3 years; "Long Term" is 3 years or longer.</p> <p><u>Status:</u> "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.</p> <p><u>Status Rationale:</u> A statement of justification as to why the project is currently in the status it is in.</p>								

Completed or Removed Mitigation Initiatives

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

Mitigation: Contract for an updated inundation study, if needed.

Status: Complete.

Mitigation: Design facilities with flexible connections.

Status: Removed. Facilities have flexible connections and any replacement or upgrades will include.

Mitigation: Install camera and wireless communication at all facilities.

Status: Complete.

Mitigation: Consider collecting and treating supplies from Villa Park Dam.

Status: Removed. This mitigation is not feasible; nor is it necessary.

Mitigation: Examine opportunities for on-line water quality sensing relative to potential human induced contamination, and implement if feasible.

Status: Removed; reviewing possible SCADA improvements at the same time. No longer feasible. Have inline chlorine monitors.

PLAN INTEGRATION

Serrano's capital budget, Water Master Plan, and Emergency Response Plan are all used to implement mitigation initiatives identified in this annex. The District will update its Emergency Response Plan that will establish protocol and incorporate applicable areas of the HMP. After adoption of the HMP, the District will continue to integrate mitigation priorities into these documents.