



CITY OF VERNON

2020 URBAN WATER MANAGEMENT PLAN

VOLUME 2 – APPENDICES



JUNE 15, 2021

Prepared by

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INTERNATIONAL

CITY OF VERNON

2020 URBAN WATER MANAGEMENT PLAN

VOLUME 2 – APPENDICES

June 15, 2021

PREPARED FOR

CITY OF VERNON
4305 SOUTH SANTA FE AVENUE
VERNON, CA 90058

PREPARED BY



This volume is intended to accompany Volume 1 of the City of Vernon 2020 Urban Water Management Plan (UWMP). Its purpose is to provide reference material cited in the UWMP as mandated by the California Urban Water Management Planning Act or in support thereof.

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References

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Appendix A

WUE and SB X7-7 Standardized Tables

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Submittal Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020 *
<i>Add additional rows as needed</i>			
CA1910167	City of Vernon	1,088	6,547
TOTAL		1,088	6,547
* Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.			
NOTES: 1,088 potable water meters. Volume of water supplied does not include recycled water (1 recycled water meter).			

Submittal Table 2-2: Plan Identification			
Select Only One	Type of Plan		Name of RUWMP or Regional Alliance <i>if applicable</i> (select from drop down list)
<input checked="" type="checkbox"/>	Individual UWMP		
	<input type="checkbox"/>	Water Supplier is also a member of a RUWMP	
	<input checked="" type="checkbox"/>	Water Supplier is also a member of a Regional Alliance	Gateway Regional Alliance
<input type="checkbox"/>	Regional Urban Water Management Plan (RUWMP)		
NOTES:			

Submittal Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
<input type="checkbox"/>	Supplier is a wholesaler
<input checked="" type="checkbox"/>	Supplier is a retailer
Fiscal or Calendar Year (select one)	
<input checked="" type="checkbox"/>	UWMP Tables are in calendar years
<input type="checkbox"/>	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
Units of measure used in UWMP * (select from drop down)	
Unit	AF
<i>* Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.</i>	
NOTES: Per capita water use is reported as gallon per capita per day (GPCD)	

Submittal Table 2-4 Retail: Water Supplier Information Exchange
The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
<i>Add additional rows as needed</i>

Central Basin Municipal Water District

NOTES:

Submittal Table 3-1 Retail: Population - Current and Projected

Population Served	2020	2025	2030	2035	2040	2045(opt)
	100	100	100	100	100	100

NOTES:

Submittal Table 4-1 Retail: Demands for Potable and Non-Potable¹ Water - Actual

Use Type	2020 Actual		
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume ²
Add additional rows as needed			
Single Family	Single Family Residential	Drinking Water	6
Multi-Family	Multi Family Residential	Drinking Water	2
Commercial	Commercial	Drinking Water	5,045
Industrial	Industrial	Drinking Water	1,234
Losses	Losses	Drinking Water	249
Other Potable	Other	Drinking Water	11
TOTAL			6,547
¹ Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4. Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.			
NOTES:			

Submittal Table 4-2 Retail: Use for Potable and Non-Potable¹ Water - Projected

Use Type	Additional Description (as needed)	Projected Water Use ² Report To the Extent that Records are Available				
<u>Drop down list</u> May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool		2025	2030	2035	2040	2045 (opt)
Add additional rows as needed						
Single Family	Single Family Residential	6	6	6	6	6
Multi-Family	Multi Family Residential	2	2	2	2	2
Commercial	Commercial	4,600	4,600	4,600	4,600	4,600
Industrial	Industrial	4,600	4,600	4,600	4,600	4,600
Other Potable	Other	252	252	252	252	252
Losses	Losses	600	600	600	600	600
TOTAL		10,060	10,060	10,060	10,060	10,060

¹ Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4. ² Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.

NOTES:

Submittal Table 4-3 Retail: Total Water Use (Potable and Non-Potable)

	2020	2025	2030	2035	2040	2045 (opt)
Potable Water, Raw, Other Non-potable <i>From Tables 4-1R and 4-2 R</i>	6,547	10,060	10,060	10,060	10,060	10,060
Recycled Water Demand ¹ <i>From Table 6-4</i>	773	800	800	800	800	800
Optional Deduction of Recycled Water Put Into Long-Term Storage ²						
TOTAL WATER USE	7,320	10,860	10,860	10,860	10,860	10,860

¹ Recycled water demand fields will be blank until Table 6-4 is complete

2

Long term storage means water placed into groundwater or surface storage that is not removed from storage in the same year. Supplier **may** deduct recycled water placed in long-term storage from their reported demand. This value is manually entered into Table 4-3.

NOTES:

Submittal Table 4-4 Retail: Last Five Years of Water Loss Audit Reporting

Reporting Period Start Date (mm/yyyy)	Volume of Water Loss ^{1,2}
07/2016	555
07/2017	512
07/2018	505
07/2019	249

¹ Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet. ²
Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.

NOTES: AWWA Water Audits are completed on a fiscal year schedule (July through June). The City's first AWWA Water Audit was completed starting FY 2016-2017.

Submittal Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) <i>Drop down list (y/n)</i>	No
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	
Are Lower Income Residential Demands Included In Projections? <i>Drop down list (y/n)</i>	Yes
NOTES: The City has already achieved a high level of water use efficiency. The City's current goal is to maintain that level. Residential demand accounts for approximately 0.1% of total demand and plays no significant role in demand projections.	

Submittal Table 5-1 Baselines and Targets Summary
From SB X7-7 Verification Form
Retail Supplier or Regional Alliance Only

Baseline Period	Start Year *	End Year *	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	1999	2008	100296	89809
5 Year	2003	2007	98128	

**All cells in this table should be populated manually from the supplier's SBX7-7 Verification Form and reported in Gallons per Capita per Day (GPCD)*

NOTES:

Submittal Table 5-2: 2020 Compliance SB X7-7 2020 Compliance Form <i>Retail Supplier or Regional Alliance Only</i>				From
2020 GPCD			2020 Confirmed Target GPCD*	Did Supplier Achieve Targeted Reduction for 2020? Y/N
Actual 2020 GPCD*	2020 TOTAL Adjustments*	Adjusted 2020 GPCD* <i>(Adjusted if applicable)</i>		
59814	0	-	89809	Y
<i>*All cells in this table should be populated manually from the supplier's SBX7-7 2020 Compliance Form and reported in Gallons per Capita per Day (GPCD)</i>				
NOTES:				

Submittal Table 6-1 Retail: Groundwater Volume Pumped						
<input type="checkbox"/>	Supplier does not pump groundwater. The supplier will not complete the table below.					
<input type="checkbox"/>	All or part of the groundwater described below is desalinated.					
Groundwater Type Drop Down List May use each category multiple times	Location or Basin Name	2016*	2017*	2018*	2019*	2020*
Add additional rows as needed						
Alluvial Basin	Central Basin	6098	6566	6569	5852	6127
TOTAL		6,098	6,566	6,569	5,852	6,127
* Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.						
NOTES:						

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2020						
<input type="checkbox"/>	There is no wastewater collection system. The supplier will not complete the table below.					
	Percentage of 2020 service area covered by wastewater collection system <i>(optional)</i>					
	Percentage of 2020 service area population covered by wastewater collection system <i>(optional)</i>					
Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? <i>Drop Down List</i>	Volume of Wastewater Collected from UWMP Service Area 2020 *	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? <i>Drop Down List</i>	Is WWTP Operation Contracted to a Third Party? <i>(optional)</i> <i>Drop Down List</i>
City of Vernon	Estimated	6,588	LACSD	Joint Water Pollution Control Plant	No	
Total Wastewater Collected from Service Area in 2020:		6,588				
* Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3 .						
NOTES: Volume of Wastewater Collected from UWMP Service Area 2020 estimated as 90% of water sales.						

Submittal Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020

<input checked="" type="checkbox"/>	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.										
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number (optional) ²	Method of Disposal <i>Drop down list</i>	Does This Plant Treat Wastewater Generated Outside the Service Area? <i>Drop down list</i>	Treatment Level <i>Drop down list</i>	2020 volumes ¹				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Total							0	0	0	0	0

¹ Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.

² If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at <https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility>

NOTES:

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area

<input type="checkbox"/> Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.											
Name of Supplier Producing (Treating) the Recycled Water:		Los Angeles County Sanitation Districts (LACSD)									
Name of Supplier Operating the Recycled Water Distribution System:		Central Basin Municipal Water District									
Supplemental Water Added in 2020 (volume) <i>Include units</i>											
Source of 2020 Supplemental Water											
Beneficial Use Type <i>additional rows if needed.</i>	<i>Insert</i> Potential Beneficial Uses of Recycled Water (Describe)	Amount of Potential Uses of Recycled Water (Quantity) <i>Include volume units ¹</i>	General Description of 2020 Uses	Level of Treatment <i>Drop down list</i>	2020 ¹	2025 ¹	2030 ¹	2035 ¹	2040 ¹	2045 ¹ (opt)	
Agricultural irrigation											
Landscape irrigation (exc golf courses)											
Golf course irrigation											
Commercial use											
Industrial use											
Geothermal and other energy production	Energy Production	800 AFY	Warburg Generating Station	Tertiary	773	800	800	800	800	800	
Seawater intrusion barrier											
Recreational impoundment											
Wetlands or wildlife habitat											
Groundwater recharge (IPR)											
Reservoir water augmentation (IPR)											
Direct potable reuse											
Other (Description Required)											
Total:					773	800	800	800	800	800	
2020 Internal Reuse											
¹ Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.											
NOTES:											

Submittal Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual

<input type="checkbox"/>	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below. If recycled water was not used in 2020, and was not predicted to be in 2015, then check the box and do not complete the table.
--------------------------	--

Beneficial Use Type	2015 Projection for 2020 ¹	2020 Actual Use ¹
<i>Insert additional rows as needed.</i>		
Agricultural irrigation		
Landscape irrigation (exc golf courses)		
Golf course irrigation		
Commercial use		
Industrial use		
Geothermal and other energy production	800	773
Seawater intrusion barrier		
Recreational impoundment		
Wetlands or wildlife habitat		
Groundwater recharge (IPR)		
Reservoir water augmentation (IPR)		
Direct potable reuse		
Other (Description Required)		
Total	800	773

¹ Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.

NOTE:

Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
<input checked="" type="checkbox"/>	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
Page 6-19	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use *
<i>Add additional rows as needed</i>			
Total			0
*Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.			
NOTES:			

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
<input checked="" type="checkbox"/>	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
<input type="checkbox"/>	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type <i>Drop Down List</i>	Expected Increase in Water Supply to Supplier* <i>This may be a range</i>
	<i>Drop Down List (y/n)</i>	<i>If Yes, Supplier Name</i>				
<i>Add additional rows as needed</i>						
*Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.						
NOTES:						

Submittal Table 6-8 Retail: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2020		
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool		Actual Volume*	Water Quality Drop Down List	Total Right or Safe Yield* (optional)
Add additional rows as needed				
Purchased or Imported Water	CBMWD	573	Drinking Water	
Recycled Water	CBMWD	773	Recycled Water	
Groundwater (not desalinated)	Central Basin	6,127	Drinking Water	
Total		7,473		0
<i>*Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.</i>				
NOTES:				

Submittal Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply * Report To the Extent Practicable									
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool		2025		2030		2035		2040		2045 (opt)	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Add additional rows as needed											
Groundwater (not desalinated)	Central Basin	7,539		7,539		7,539		7,539		7,539	
Purchased or Imported Water	CBMWD	305		305		305		305		305	
Recycled Water	CBMWD	800		800		800		800		800	
Total		8,644	0	8,644	0	8,644	0	8,644	0	8,644	0
*Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.											
NOTES											

Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)

Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 2019-2020, use 2020	Available Supplies if Year Type Repeats	
		<input type="checkbox"/>	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____
		<input checked="" type="checkbox"/>	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available *	% of Average Supply
Average Year	2008		100%
Single-Dry Year	2007		100%
Consecutive Dry Years 1st Year	2011		100%
Consecutive Dry Years 2nd Year	2012		100%
Consecutive Dry Years 3rd Year	2013		100%
Consecutive Dry Years 4th Year	2014		100%
Consecutive Dry Years 5th Year	2015		100%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

***Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.**

NOTES:

Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 <i>(Opt)</i>
Supply totals <i>(autofill from Table 6-9)</i>	10,860	10,860	10,860	10,860	10,860
Demand totals <i>(autofill from Table 4-3)</i>	10,860	10,860	10,860	10,860	10,860
Difference	0	0	0	0	0
NOTES:					

Submittal Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 (Opt)
Supply totals*	10,860	10,860	10,860	10,860	10,860
Demand totals*	10,860	10,860	10,860	10,860	10,860
Difference	0	0	0	0	0
<i>*Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.</i>					
NOTES:					

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison

		2025*	2030*	2035*	2040*	2045* (Opt)
First year	Supply totals	10,860	10,860	10,860	10,860	10,860
	Demand totals	10,860	10,860	10,860	10,860	10,860
	Difference	0	0	0	0	0
Second year	Supply totals	10,860	10,860	10,860	10,860	10,860
	Demand totals	10,860	10,860	10,860	10,860	10,860
	Difference	0	0	0	0	0
Third year	Supply totals	10,860	10,860	10,860	10,860	10,860
	Demand totals	10,860	10,860	10,860	10,860	10,860
	Difference	0	0	0	0	0
Fourth year	Supply totals	10,643	10,643	10,643	10,643	10,643
	Demand totals	10,643	10,643	10,643	10,643	10,643
	Difference	0	0	0	0	0
Fifth year	Supply totals	10,860	10,860	10,860	10,860	10,860
	Demand totals	10,860	10,860	10,860	10,860	10,860
	Difference	0	0	0	0	0
Sixth year (optional)	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0

****Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.***

NOTES:

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)

2021	Total
Total Water Use	7,200
Total Supplies	8,339
Surplus/Shortfall w/o WSCP Action	1,139
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	1,139
Resulting % Use Reduction from WSCP action	0%

2022	Total
Total Water Use	7,200
Total Supplies	8,339
Surplus/Shortfall w/o WSCP Action	1,139
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	1,139
Resulting % Use Reduction from WSCP action	0%

2023	Total
Total Water Use	7,200
Total Supplies	8,339
Surplus/Shortfall w/o WSCP Action	1,139
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	1,139
Resulting % Use Reduction from WSCP action	0%

2024	Total
Total Water Use	7,200
Total Supplies	8,339
Surplus/Shortfall w/o WSCP Action	1,139
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	1,139
Resulting % Use Reduction from WSCP action	0%

2025	Total
Total Water Use	7,200
Total Supplies	8,339
Surplus/Shortfall w/o WSCP Action	1,139
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	1,139
Resulting % Use Reduction from WSCP action	0%

Submittal Table 8-1
Water Shortage Contingency Plan Levels

Shortage Level	Percent Shortage Range	Shortage Response Actions <i>(Narrative description)</i>
1	Up to 10%	Water Conservation Stage I - City Council determines it is likely that the City of Vernon will suffer a shortage in City water supplies up to 20%, but shall become mandatory when the City Council determines that the City will suffer a water shortage in excess of 20% of its normal water supplies.
2	Up to 20%	Water Conservation Stage I - City Council determines it is likely that the City of Vernon will suffer a shortage in City water supplies up to 20%, but shall become mandatory when the City Council determines that the City will suffer a water shortage in excess of 20% of its normal water supplies.
3	Up to 30%	Water Conservation Stage I - City Council determines it is likely that the City of Vernon will suffer a shortage in City water supplies up to 20%, but shall become mandatory when the City Council determines that the City will suffer a water shortage in excess of 20% of its normal water supplies.
4	Up to 40%	Water Conservation Stage II - City Council determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions, except that a phase II Water Supply Shortage shall become mandatory when the City Council determines that the City will suffer a water shortage in excess of 30% of its normal water supplies.
5	Up to 50%	Water Conservation Stage II - City Council determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions, except that a phase II Water Supply Shortage shall become mandatory when the City Council determines that the City will suffer a water shortage in excess of 30% of its normal water supplies.
6	>50%	Water Conservation Stage III (Emergency Condition) - City of Vernon declares a water shortage emergency or when the City Council determines that the City will suffer a shortage of more than 50% of its normal water supplies.

NOTES:

Submittal Table 8-2: Demand Reduction Actions

Shortage Level	Demand Reduction Actions <i>Drop down list</i> <i>These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.</i>	How much is this going to reduce the shortage gap? <i>Include units used (volume type or percentage)</i>	Additional Explanation or Reference <i>(optional)</i>	Penalty, Charge, or Other Enforcement? <i>For Retail Suppliers Only</i> <i>Drop Down List</i>
<i>Add additional rows as needed</i>				
Always	Landscape - Limit landscape irrigation to specific times		Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited between the hours of 10:00 a.m. and 5:00 p.m. on any day, except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.	Yes
Always	CII - Other CII restriction or prohibition		Installation of non-re-circulating water systems is prohibited in new commercial conveyor car wash and new commercial laundry systems.	Yes
Always	Landscape - Restrict or prohibit runoff from landscape irrigation		Watering or irrigating of any lawn, landscape or other vegetated area in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch is prohibited.	Yes
Always	Other - Prohibit use of potable water for washing hard surfaces		Washing down hard or exterior paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, patios or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, a low-volume, high-pressure cleaning machine equipped to recycle any water used, or a low-volume high-pressure water broom.	Yes

Always	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner		Excessive use, loss or escape of water through breaks, leaks or other malfunctions in the water user's plumbing or distribution system for any period of time after such escape of water should have reasonably been discovered is prohibited and shall be repaired as soon as reasonably practicable.	Yes
Always	Water Features - Restrict water use for decorative water features, such as fountains		Operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited.	Yes
Always	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water		Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not is prohibited, except by use of a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device. This subsection does not apply to any commercial vehicle washing facility.	Yes
Always	CII - Restaurants may only serve water upon request		Eating or drinking establishments, including but not limited to a restaurant, hotel, cafe, cafeteria, bar, or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.	Yes
Always	CII - Other CII restriction or prohibition		Installation of single pass cooling systems is prohibited in buildings requesting new water service.	Yes
Always	Landscape - Limit landscape irrigation to specific times		Watering or irrigating of lawn, landscape or other vegetated area with potable water using a landscape irrigation system or a watering device that is not continuously attended is limited to no more than fifteen (15) minutes watering per day per station. This subsection does not apply to landscape irrigation systems that exclusively use very low-flow driptype irrigation systems when no emitter produces more than two (2) gallons of water per hour and weather based controllers or stream rotor sprinklers that meet a seventy percent (70%) efficiency standard.	Yes

6	CII - Other CII restriction or prohibition		The city may, by written request, require all commercial and industrial customers using 100 acre feet or more per year of potable water to submit a water conservation plan and quarterly progress reports on such plan. The conservation plan shall include recommendations for increased water savings, including increased water recycling based on feasibility. The quarterly report shall include progress to date on implementation of such recommendations.	Yes
6	Other		The use of water from a fire hydrant shall be limited to fire fighting and related activities. Other uses of city water for municipal purposes shall be limited to activities necessary to maintain the public health, safety and welfare.	Yes
6	Other		No customer shall make, cause, use or permit the use of city water for any purpose in excess of seventy-five percent (75%) of the amount used the same corresponding monthly billing period two (2) years preceding the city council declaring a Phase I Water Supply Shortage. In the case of a newly established business, no restriction shall be required until such time that the business has been established for one (1) year, at which time the preceding year's corresponding monthly billing period shall be used to determine the businesses monthly water consumption.	Yes
6	Landscape - Limit landscape irrigation to specific times		Commercial Nurseries shall be prohibited from watering lawn, landscaped or other turf areas more often than every third (3rd) day and shall be prohibited from watering between the hours of 6:00 a.m. and 6:00 p.m.	Yes
6	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner		All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within twenty four (24) hours of notification by the city unless other arrangements are made with the city.	Yes

6	Landscape - Prohibit certain types of landscape irrigation		<p>Watering/irrigating of lawn/landscape/other vegetated areas with potable water is prohibited. Restriction does not apply to the following categories of use, unless the city has determined that recycled water is available & may be applied to the use:</p> <p>Maintenance of (1) vegetation, including trees & shrubs, that are watered using a hand-held bucket or similar container, hand held hose equipped with a positive self-closing water shut-off nozzle or device; (2) existing landscape necessary for fire protection; (3) existing landscape for soil erosion control; (4) plant materials identified to be rare or essential to the well-being of protected species; (5) landscape within active public playing fields and school grounds, provided that such irrigation does not exceed two (2) days per week according to the schedule established in Section 25.104(a) and the time restrictions as established in section 25.103(a); (6) Actively irrigated environmental mitigation projects.</p>	Yes
4 & 5	Other		<p>No customer shall make, cause, use or permit the use of city water for any purpose in excess of eighty-five percent (85%) of the amount used the same corresponding monthly billing period two (2) years preceding the city council declaring a Phase I Water Supply Shortage. In the case of a newly established business, no restriction shall be required until such time that the business has been established for one (1) year, at which time the preceding year's corresponding monthly billing shall be used to determine the businesses monthly water consumption.</p>	Yes
4 & 5	Landscape - Limit landscape irrigation to specific times		<p>Commercial Nurseries shall be prohibited from watering lawn, landscaped or other turf areas more often than every other day and shall be prohibited from watering between the hours of 10:00 a.m. and 4:00 p.m.</p>	Yes
4 & 5	Other		<p>Refilling of more than one (1) foot and initial filling of residential swimming pools or outdoor spas with potable water is prohibited.</p>	Yes

4 & 5	Other		Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not, is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-of nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a re-circulating water system to capture or reuse water.	Yes
4 & 5	Water Features - Restrict water use for decorative water features, such as fountains		Filling or refilling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under this article.	Yes
4 & 5	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner		All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by the city unless other arrangements are made with the city.	Yes
4 & 5	Landscape - Limit landscape irrigation to specific times		Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to two (2) days per week on a schedule established and posted by the city. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one (1) day per week on a schedule established and posted by the city. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.	Yes

1, 2, & 3	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner		All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within seventy-two (72) hours of notification by the city unless other arrangements are made with the city.	Yes
1, 2, & 3	Landscape - Limit landscape irrigation to specific times		Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to three (3) days per week on a schedule established and posted by the City. Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited between the hours of 6:00 a.m. and 6:00 p.m. Pacific Standard Time. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.	Yes

NOTES: During Water Conservation Stage I (Shortage Levels 1, 2, and 3), irrigation limitations and mandatory repairs to leaks will have a noticeable impact on water demand reduction. During Water Conservation Stage II (Shortage Levels 4 and 5), the City will reach out to its water use intensive customers to identify any opportunities to reduce water loss or excessive use. This is a relatively small number of customers and the impact is expected to be significant and immediate once communication is opened up. During Water Conservation Stage III (Shortage Level 6), the City will reach out to (1) all of its customers to identify any opportunities to reduce water loss or excessive use, and (2) its water use intensive customers to submit monthly reports on water conservation plan implementation. The impact of these additional steps is expected to be significant and immediate once communication is opened up.

Submittal Table 8-3: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier <i>Drop down list</i> <i>These are the only categories that will be accepted by the WUEdata online submittal tool</i>	How much is this going to reduce the shortage gap? <i>Include units used (volume type or percentage)</i>	Additional Explanation or Reference <i>(optional)</i>
Add additional rows as needed			
NOTES: At a minimum for the next five years, the City will have access to 140% of its Allowable Pumping Allocation in Central Basin at 10,555 AFY in accordance with the Third Amended Judgment, and sufficient recycled water to operate the Malburg Generation Station at 800 AFY. Thus, no supply augmentation actions are proposed to be included in the shortage response actions at this time.			

Submittal Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Vernon		Yes
County Name <i>Drop Down List</i>	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Los Angeles County	Yes	Yes
NOTES:		

SB X7-7 Table 0: Units of Measure Used in 2020 UWMP*

(select one from the drop down list)

Acre Feet

**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*

NOTES:

SB X7-7 Table 2: Method for 2020 Population Estimate**Method Used to Determine 2020 Population**
(may check more than one)☐**1. Department of Finance (DOF) or
American Community Survey (ACS)**☐**2. Persons-per-Connection Method**☐**3. DWR Population Tool**☒**4. Other**
DWR recommends pre-review

NOTES:

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	100
NOTES:	

SB X7-7 Table 4: 2020 Gross Water Use

Compliance Year 2020	2020 Volume Into Distribution System <i>This column will remain blank until SB X7-7 Table 4-A is completed.</i>	2020 Deductions					2020 Gross Water Use
		Exported Water *	Change in Dist. System Storage* (+/-)	Indirect Recycled Water <i>This column will remain blank until SB X7-7 Table 4-B is completed.</i>	Water Delivered for Agricultural Use*	Process Water <i>This column will remain blank until SB X7-7 Table 4-D is completed.</i>	
	6,700			-		-	6,700

* Units of measure (AF, MG , or CCF) must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	CBMWD		
This water source is (check one) :			
<input type="checkbox"/>	The supplier's own water source		
<input checked="" type="checkbox"/>	A purchased or imported source		
Compliance Year 2020	Volume Entering Distribution System ¹	Meter Error Adjustment ² Optional (+/-)	Corrected Volume Entering Distribution System
	573	-	573
¹ Units of measure (AF, MG , or CCF) must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3. ² Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document			
NOTES			

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment

Complete one table for each source.

Name of Source	Groundwater		
This water source is (check one) :			
<input checked="" type="checkbox"/>	The supplier's own water source		
<input type="checkbox"/>	A purchased or imported source		
Compliance Year 2020	Volume Entering Distribution System ¹	Meter Error Adjustment ² Optional (+/-)	Corrected Volume Entering Distribution System
	6,127		6,127
¹ Units of measure (AF, MG , or CCF) must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3. ² Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document			
NOTES:			

SB X7-7 Table 4-B: 2020 Indirect Recycled Water Use Deduction *(For use only by agencies that are deducting indirect recycled water)*

2020 Compliance Year	2020 Surface Reservoir Augmentation					2020 Groundwater Recharge			Total Deductible Volume of Indirect Recycled Water Entering the Distribution System
	Volume Discharged from Reservoir for Distribution System Delivery ¹	Percent Recycled Water	Recycled Water Delivered to Treatment Plant	Transmission/Treatment Loss ¹	Recycled Volume Entering Distribution System from Surface Reservoir Augmentation	Recycled Water Pumped by Utility ^{1,2}	Transmission/Treatment Losses ¹	Recycled Volume Entering Distribution System from Groundwater Recharge	
			-		-			-	-

¹ **Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3. ²

Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.

NOTES: N/A

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

SB X7-7 Table 4-C: 2020 Process Water Deduction Eligibility
(For use only by agencies that are deducting process water) Choose Only One

<input type="checkbox"/>	Criteria 1- Industrial water use is equal to or greater than 12% of gross water use. Complete SB X7-7 Table 4-C.1
<input type="checkbox"/>	Criteria 2 - Industrial water use is equal to or greater than 15 GPCD. Complete SB X7-7 Table 4-C.2
<input type="checkbox"/>	Criteria 3 - Non-industrial use is equal to or less than 120 GPCD. Complete SB X7-7 Table 4-C.3
<input type="checkbox"/>	Criteria 4 - Disadvantaged Community. Complete SB x7-7 Table 4-C.4

NOTES: N/A

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

SB X7-7 Table 4-C.1: 2020 Process Water Deduction Eligibility *(For use only by agencies that are deducting process water using Criteria 1)*

Criteria 1				
Industrial water use is equal to or greater than 12% of gross water use				
2020 Compliance Year	2020 Gross Water Use Without Process Water Deduction	2020 Industrial Water Use	Percent Industrial Water	Eligible for Exclusion Y/N
	6,700		0%	NO
NOTES: N/A				

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

SB X7-7 Table 4-C.2: 2020 Process Water Deduction Eligibility (For use only by agencies that are deducting process water using Criteria 2)				
Criteria 2 Industrial water use is equal to or greater than 15 GPCD				
2020 Compliance Year	2020 Industrial Water Use	2020 Population	2020 Industrial GPCD	Eligible for Exclusion Y/N
		100	-	NO
NOTES: N/A				

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

SB X7-7 Table 4-C.3: 2020 Process Water Deduction Eligibility

(For use only

by agencies that are deducting process water using Criteria 3)

Criteria 3

Non-industrial use is equal to or less than 120 GPCD

2020 Compliance Year	2020 Gross Water Use Without Process Water Deduction <i>Fm SB X7-7 Table 4</i>	2020 Industrial Water Use	2020 Non-industrial Water Use	2020 Population <i>Fm SB X7-7 Table 3</i>	Non-Industrial GPCD	Eligible for Exclusion Y/N
	6,700		6,700	100	59,814	NO

NOTES: N/A

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

SB X7-7 Table 4-C.4: 2020 Process Water Deduction Eligibility *(For use only by agencies that are deducting process water using Criteria 4)*

Criteria 4

Disadvantaged Community. A "Disadvantaged Community" (DAC) is a community with a median household income less than 80 percent of the statewide average.

SELECT ONE

"Disadvantaged Community" status was determined using one of the methods listed below:

1. IRWM DAC Mapping tool <https://gis.water.ca.gov/app/dacs/>

☐

If using the IRWM DAC Mapping Tool, include a screen shot from the tool showing that the service area is considered a DAC.

2. 2020 Median Income

	California Median Household Income*		Service Area Median Household Income	Percentage of Statewide Average	Eligible for Exclusion? Y/N
<input type="checkbox"/>	2020	\$75,235		0%	YES
*California median household income 2015 -2019 as reported in US Census Bureau QuickFacts.					

NOTES: N/A

Data from these tables will not be entered into WUEdata.

Instead, the

entire tables will be uploaded to WUEdata as a separate upload in Excel format.

This table(s) is only for Suppliers that deduct process water from their 2020 gross water use.

SB X7-7 Table 4-D: 2020 Process Water Deduction - Volume

Complete a

separate table for each industrial customer with a process water exclusion

Name of Industrial Customer

Enter Name of Industrial Customer 1

Compliance Year 2020	Industrial Customer's Total Water Use *	Total Volume Provided by Supplier*	% of Water Provided by Supplier	Customer's Total Process Water Use*	Volume of Process Water Eligible for Exclusion for this Customer
					-

* **Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES: N/A

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water <i>Fm SB X7-7 Table 4</i>	2020 Population <i>Fm</i> <i>SB X7-7 Table 3</i>	2020 GPCD
6,700	100	59,814
NOTES:		

SB X7-7 Table 9: 2020 Compliance

Actual 2020 GPCD ¹	Optional Adjustments to 2020 GPCD					2020 Confirmed Target GPCD ^{1, 2}	Did Supplier Achieve Targeted Reduction for 2020?
	Enter "0" if Adjustment Not Used			TOTAL Adjustments ¹	Adjusted 2020 GPCD ¹ <i>(Adjusted if applicable)</i>		
	Extraordinary Events ¹	Weather Normalization ¹	Economic Adjustment ¹				
59,814	-	-	-	-	59,814	89809	YES

¹ All values are reported in GPCD

² **2020 Confirmed Target GPCD** is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.

NOTES:

Appendix B

California Water Code

Urban Water Management Planning

The following is Appendix A from the UWMP Guidebook 2020. This document presents updated sections of the Water Code as of January 1, 2020, as compiled by DWR staff, and focuses on the portions of code directly relevant to preparation of the urban water management plan.

Appendix A. California Water Code – Urban Water Management Planning

This material is for informational purposes only and not to be used in place of official California Water Code (Water Code).

This document presents updated sections of Water Code as of January 1, 2020, as compiled by DWR staff. The selection focuses on the portions of code directly relevant to preparation of the urban water management plan and contextually relevant to urban water suppliers and the Department of Water Resources (DWR). This includes the Urban Water Management Planning Act and the Sustainable Water Use and Demand Reduction (SB X7-7), and more. Further legislative information is available on the California Legislative Information website at

<https://leginfo.legislature.ca.gov/>.

The following Water Code sections are included in this appendix.

- **Sustainable Water Use and Demand Reduction (SB X7-7)
Water Code Division 6, Part 2.55**
 - **Chapter 1. General Declarations and Policy**, Sections 10608 – 10608.8
 - **Chapter 2. Definitions**, Section 10608.12
 - **Chapter 3. Urban Retail Water Suppliers**, Sections 10608.16 – 10608.44
 - **Chapter 4. Agricultural Water Suppliers**, Section 10608.48
 - **Chapter 5. Sustainable Water Management**, Section 10608.50
 - **Chapter 6. Standardized Data Collection**, Section 10608.52
 - **Chapter 7. Funding Provisions**, Sections 10608.56 – 10608.60
 - **Chapter 8. Quantifying Agricultural Water Use Efficiency**, Section 10608.64

- **Urban Water Management Planning Act
Water Code Division 6, Part 2.6**
 - **Chapter 1. General Declaration and Policy**, Sections 10610 – 10610.4
 - **Chapter 2. Definitions**, Sections 10611 – 10618
 - **Chapter 3. Urban Water Management Plans**
 - Article 1. General Provisions, Sections 10620 – 10621
 - Article 2. Contents of Plans, Sections 10630 – 10634
 - Article 2.5. Water Service Reliability, Section 10635
 - Article 3. Adoption and Implementation of Plans, Sections 10640 – 10645
 - **Chapter 4. Miscellaneous Provisions**, Sections 10650 – 10657

**PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION
CHAPTER 1. General Declaration and Policy [10608 – 10608.8]**

10608. The Legislature finds and declares all of the following:

- (a) Water is a public resource that the California Constitution protects against waste and unreasonable use.
- (b) Growing population, climate change, and the need to protect and grow California’s economy while protecting and restoring our fish and wildlife habitats make it essential that the state manage its water resources as efficiently as possible.
- (c) Diverse regional water supply portfolios will increase water supply reliability and reduce dependence on the Delta.
- (d) Reduced water use through conservation provides significant energy and environmental benefits, and can help protect water quality, improve streamflows, and reduce greenhouse gas emissions.
- (e) The success of state and local water conservation programs to increase efficiency of water use is best determined on the basis of measurable outcomes related to water use or efficiency.
- (f) Improvements in technology and management practices offer the potential for increasing water efficiency in California over time,

providing an essential water management tool to meet the need for water for urban, agricultural, and environmental uses.

- (g) The Governor has called for a 20 percent per capita reduction in urban water use statewide by 2020.
- (h) The factors used to formulate water use efficiency targets can vary significantly from location to location based on factors including weather, patterns of urban and suburban development, and past efforts to enhance water use efficiency.
- (i) Per capita water use is a valid measure of a water provider's efforts to reduce urban water use within its service area. However, per capita water use is less useful for measuring relative water use efficiency between different water providers. Differences in weather, historical patterns of urban and suburban development, and density of housing in a particular location need to be considered when assessing per capita water use as a measure of efficiency.

10608.4. It is the intent of the Legislature, by the enactment of this part, to do all of the following:

- (a) Require all water suppliers to increase the efficiency of use of this essential resource.
- (b) Establish a framework to meet the state targets for urban water conservation identified in this part and called for by the Governor.
- (c) Measure increased efficiency of urban water use on a per capita basis.
- (d) Establish a method or methods for urban retail water suppliers to determine targets for achieving increased water use efficiency by the year 2020, in accordance with the Governor's goal of a 20-percent reduction.
- (e) Establish consistent water use efficiency planning and implementation standards for urban water suppliers and agricultural water suppliers.
- (f) Promote urban water conservation standards that are consistent with the California Urban Water Conservation Council's adopted best management practices and the requirements for demand management in Section 10631.

- (g) Establish standards that recognize and provide credit to water suppliers that made substantial capital investments in urban water conservation since the drought of the early 1990s.
- (h) Recognize and account for the investment of urban retail water suppliers in providing recycled water for beneficial uses.
- (i) Require implementation of specified efficient water management practices for agricultural water suppliers.
- (j) Support the economic productivity of California's agricultural, commercial, and industrial sectors.
- (k) Advance regional water resources management.

10608.8. (a) (1) Water use efficiency measures adopted and implemented pursuant to this part or Part 2.8 (commencing with Section 10800) are water conservation measures subject to the protections provided under Section 1011.

(2) Because an urban agency is not required to meet its urban water use target until 2020 pursuant to subdivision (b) of Section 10608.24, an urban retail water supplier's failure to meet those targets shall not establish a violation of law for purposes of any state administrative or judicial proceeding prior to January 1, 2021. Nothing in this paragraph limits the use of data reported to the department or the board in litigation or an administrative proceeding. This paragraph shall become inoperative on January 1, 2021.

(3) To the extent feasible, the department and the board shall provide for the use of water conservation reports required under this part to meet the requirements of Section 1011 for water conservation reporting.

- (b) This part does not limit or otherwise affect the application of Chapter 3.5 (commencing with Section 11340), Chapter 4 (commencing with Section 11370), Chapter 4.5 (commencing with Section 11400), and Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code.
- (c) This part does not require a reduction in the total water used in the agricultural or urban sectors, because other factors, including, but not limited to, changes in agricultural economics or population

growth may have greater effects on water use. This part does not limit the economic productivity of California's agricultural, commercial, or industrial sectors.

- (d) The requirements of this part do not apply to an agricultural water supplier that is a party to the Quantification Settlement Agreement, as defined in subdivision (a) of Section 1 of Chapter 617 of the Statutes of 2002, during the period within which the Quantification Settlement Agreement remains in effect. After the expiration of the Quantification Settlement Agreement, to the extent conservation water projects implemented as part of the Quantification Settlement Agreement remain in effect, the conserved water created as part of those projects shall be credited against the obligations of the agricultural water supplier pursuant to this part.

CHAPTER 2. Definitions [10608.12]

10608.12. Unless the context otherwise requires, the following definitions govern the construction of this part:

- (a) "Agricultural water supplier" means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. "Agricultural water supplier" includes a supplier or contractor for water, regardless of the basis of right, that distributes or sells water for ultimate resale to customers. "Agricultural water supplier" does not include the department.
- (b) "Base daily per capita water use" means any of the following:
 - (1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.
 - (2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the

calculation described in paragraph (1) up to an additional five years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

- (3) For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.
- (c) "Baseline commercial, industrial, and institutional water use" means an urban retail water supplier's base daily per capita water use for commercial, industrial, and institutional users.
- (d) "CII water use" means water used by commercial water users, industrial water users, institutional water users, and large landscape water users.
- (e) "Commercial water user" means a water user that provides or distributes a product or service.
- (f) "Compliance daily per capita water use" means the gross water use during the final year of the reporting period, reported in gallons per capita per day.
- (g) "Disadvantaged community" means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.
- (h) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:
- (1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.
 - (2) The net volume of water that the urban retail water supplier places into long-term storage.
 - (3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.
 - (4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.
- (i) "Industrial water user" means a water user that is primarily a

manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.

- (j) “Institutional water user” means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.
- (k) “Interim urban water use target” means the midpoint between the urban retail water supplier’s base daily per capita water use and the urban retail water supplier’s urban water use target for 2020.
- (l) “Large landscape” means a nonresidential landscape as described in the performance measures for CII water use adopted pursuant to Section 10609.10.
- (m) “Locally cost effective” means that the present value of the local benefits of implementing an agricultural efficiency water management practice is greater than or equal to the present value of the local cost of implementing that measure.
- (n) “Performance measures” means actions to be taken by urban retail water suppliers that will result in increased water use efficiency by CII water users. Performance measures may include, but are not limited to, educating CII water users on best management practices, conducting water use audits, and preparing water management plans. Performance measures do not include process water.
- (o) “Potable reuse” means direct potable reuse, indirect potable reuse for groundwater recharge, and reservoir water augmentation as those terms are defined in Section 13561.
- (p) “Process water” means water used by industrial water users for producing a product or product content or water used for research and development. Process water includes, but is not limited to, continuous manufacturing processes, and water used for testing, cleaning, and maintaining equipment. Water used to cool machinery or buildings used in the manufacturing process or necessary to maintain product quality or chemical characteristics for product manufacturing or control rooms, data centers, laboratories, clean rooms, and other industrial facility units that

are integral to the manufacturing or research and development process is process water. Water used in the manufacturing process that is necessary for complying with local, state, and federal health and safety laws, and is not incidental water, is process water. Process water does not mean incidental water uses.

- (q) "Recycled water" means recycled water, as defined in subdivision (n) of Section 13050.
- (r) "Regional water resources management" means sources of supply resulting from watershed-based planning for sustainable local water reliability or any of the following alternative sources of water:
 - (1) The capture and reuse of stormwater or rainwater.
 - (2) The use of recycled water.
 - (3) The desalination of brackish groundwater.
 - (4) The conjunctive use of surface water and groundwater in a manner that is consistent with the safe yield of the groundwater basin.
- (s) "Reporting period" means the years for which an urban retail water supplier reports compliance with the urban water use targets.
- (t) "Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.
- (u) "Urban water use objective" means an estimate of aggregate efficient water use for the previous year based on adopted water use efficiency standards and local service area characteristics for that year, as described in Section 10609.20.
- (v) "Urban water use target" means the urban retail water supplier's targeted future daily per capita water use.
- (w) "Urban wholesale water supplier" means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.

CHAPTER 3. Urban Retail Water Suppliers [10608.16 – 10608.44]

10608.16. (a) The state shall achieve a 20-percent reduction in urban per capita water use in California on or before December 31, 2020.

- (1) The state shall make incremental progress towards the state target specified in subdivision (a) by reducing urban per capita water use by at least 10 percent on or before December 31, 2015.

10608.20. (a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

- (2) It is the intent of the Legislature that the urban water use targets described in paragraph (1) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020.

(b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

- (1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.
- (2) The per capita daily water use that is estimated using the sum of the following performance standards:
 - (A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2017 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.
 - (B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail

water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:

(A) Consider climatic differences within the state.

(B) Consider population density differences within the state.

(C) Provide flexibility to communities and regions in meeting the targets.

(D) Consider different levels of per capita water use according to plant water needs in different regions.

(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

(c) If the department adopts a regulation pursuant to paragraph (4) of

subdivision (b) that results in a requirement that an urban retail water supplier achieve a reduction in daily per capita water use that is greater than 20 percent by December 31, 2020, an urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may limit its urban water use target to a reduction of not more than 20 percent by December 31, 2020, by adopting the method described in paragraph (1) of subdivision (b).

- (d) The department shall update the method described in paragraph (4) of subdivision (b) and report to the Legislature by December 31, 2014. An urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may adopt a new urban daily per capita water use target pursuant to this updated method.
- (e) An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.
- (f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.
- (g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).
- (h) (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:
 - (A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.

- (B) Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.
- (2) The department shall post the methodologies and criteria developed pursuant to this subdivision on its internet website, and make written copies available, by October 1, 2010. An urban retail water supplier shall use the methods developed by the department in compliance with this part.
- (i) (1) The department shall adopt regulations for implementation of the provisions relating to process water in accordance with Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.
- (2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.
- (j) (1) An urban retail water supplier is granted an extension to July 1, 2011, for adoption of an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) due in 2010 to allow the use of technical methodologies developed by the department pursuant to paragraph (4) of subdivision (b) and subdivision (h). An urban retail water supplier that adopts an urban water management plan due in 2010 that does not use the methodologies developed by the department pursuant to subdivision (h) shall amend the plan by July 1, 2011, to comply with this part.
- (2) An urban wholesale water supplier whose urban water management plan prepared pursuant to Part 2.6 (commencing with Section 10610) was due and not submitted in 2010 is granted an extension to July 1, 2011, to permit coordination between an urban wholesale water

supplier and urban retail water suppliers.

10608.22. Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph (3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

10608.24. (a) Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.

- (b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.
- (c) An urban retail water supplier's compliance daily per capita water use shall be the measure of progress toward achievement of its urban water use target.
- (d) (1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:
 - (A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.
 - (B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.
 - (C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.
- (2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.
- (e) When developing the urban water use target pursuant to Section 10608.20, an urban retail water supplier that has a substantial

percentage of industrial water use in its service area may exclude process water from the calculation of gross water use to avoid a disproportionate burden on another customer sector.

- (f) (1) An urban retail water supplier that includes agricultural water use in an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) may include the agricultural water use in determining gross water use. An urban retail water supplier that includes agricultural water use in determining gross water use and develops its urban water use target pursuant to paragraph (2) of subdivision (b) of Section 10608.20 shall use a water efficient standard for agricultural irrigation of 100 percent of reference evapotranspiration multiplied by the crop coefficient for irrigated acres.
- (2) An urban retail water supplier, that is also an agricultural water supplier, is not subject to the requirements of Chapter 4 (commencing with Section 10608.48), if the agricultural water use is incorporated into its urban water use target pursuant to paragraph (1).

10608.26. (a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

- (1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.
 - (2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.
 - (3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.
- (b) In complying with this part, an urban retail water supplier may meet its urban water use target through efficiency improvements in any combination among its customer sectors. An urban retail water supplier shall avoid placing a disproportionate burden on any customer sector.
- (c) For an urban retail water supplier that supplies water to a United States Department of Defense military installation, the urban retail water supplier's implementation plan for complying with this part shall consider the conservation of that military installation under

federal Executive Order 13514.

- (d) (1) Any ordinance or resolution adopted by an urban retail water supplier after the effective date of this section shall not require existing customers as of the effective date of this section, to undertake changes in product formulation, operations, or equipment that would reduce process water use, but may provide technical assistance and financial incentives to those customers to implement efficiency measures for process water. This section shall not limit an ordinance or resolution adopted pursuant to a declaration of drought emergency by an urban retail water supplier.

- (2) This part shall not be construed or enforced so as to interfere with the requirements of Chapter 4 (commencing with Section 113980) to Chapter 13 (commencing with Section 114380), inclusive, of Part 7 of Division 104 of the Health and Safety Code, or any requirement or standard for the protection of public health, public safety, or worker safety established by federal, state, or local government or recommended by recognized standard setting organizations or trade associations.

10608.28. (a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

- (1) Through an urban wholesale water supplier.
- (2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).
- (3) Through a regional water management group as defined in Section 10537.
- (4) By an integrated regional water management funding area.
- (5) By hydrologic region.
- (6) Through other appropriate geographic scales for which computation methods have been developed by the

department.

- (b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

10608.32. All costs incurred pursuant to this part by a water utility regulated by the Public Utilities Commission may be recoverable in rates subject to review and approval by the Public Utilities Commission, and may be recorded in a memorandum account and reviewed for reasonableness by the Public Utilities Commission.

10608.34. (a) (1) On or before January 1, 2017, the department shall adopt rules for all of the following:

- (A) The conduct of standardized water loss audits by urban retail water suppliers in accordance with the method adopted by the American Water Works Association in the third edition of Water Audits and Loss Control Programs, Manual M36 and in the Free Water Audit Software, version 5.0.
- (B) The process for validating a water loss audit report prior to submitting the report to the department. For the purposes of this section, “validating” is a process whereby an urban retail water supplier uses a technical expert to confirm the basis of all data entries in the urban retail water supplier’s water loss audit report and to appropriately characterize the quality of the reported data. The validation process shall follow the principles and terminology laid out by the American Water Works Association in the third edition of Water Audits and Loss Control Programs, Manual M36 and in the Free Water Audit Software, version 5.0. A validated water loss audit report shall include the name and technical qualifications of the person engaged for validation.
- (C) The technical qualifications required of a person to

- engage in validation, as described in subparagraph (B).
- (D) The certification requirements for a person selected by an urban retail water supplier to provide validation of its own water loss audit report.
- (E) The method of submitting a water loss audit report to the department.
- (2) The department shall update rules adopted pursuant to paragraph (1) no later than six months after the release of subsequent editions of the American Water Works Association's Water Audits and Loss Control Programs, Manual M36. Except as provided by the department, until the department adopts updated rules pursuant to this paragraph, an urban retail water supplier may rely upon a subsequent edition of the American Water Works Association's Water Audits and Loss Control Programs, Manual M36 or the Free Water Audit Software.
- (b) (1) On or before October 1 of each year until October 1, 2023, each urban retail water supplier reporting on a calendar year basis shall submit a completed and validated water loss audit report for the previous calendar year or the previous fiscal year as prescribed by the department pursuant to subdivision (a).
- (2) On or before January 1 of each year until January 1, 2024, each urban retail water supplier reporting on a fiscal year basis shall submit a completed and validated water loss audit report for the previous fiscal year as prescribed by the department pursuant to subdivision (a).
- (3) On or before January 1, 2024, and on or before January 1 of each year thereafter, each urban retail water supplier shall submit a completed and validated water loss audit report for the previous calendar year or previous fiscal year as part of the report submitted to the department pursuant to subdivision (a) of Section 10609.24 and as prescribed by the department pursuant to subdivision (a).
- (4) Water loss audit reports submitted on or before October 1, 2017, may be completed and validated with assistance as described in subdivision (c).

- (c) Using funds available for the 2016–17 fiscal year, the board shall contribute up to four hundred thousand dollars (\$400,000) towards procuring water loss audit report validation assistance for urban retail water suppliers.
- (d) Each water loss audit report submitted to the department shall be accompanied by information, in a form specified by the department, identifying steps taken in the preceding year to increase the validity of data entered into the final audit, reduce the volume of apparent losses, and reduce the volume of real losses.
- (e) At least one of the following employees of an urban retail water supplier shall attest to each water loss audit report submitted to the department:
 - (1) The chief financial officer.
 - (2) The chief engineer.
 - (3) The general manager.
- (f) The department shall deem incomplete and return to the urban retail water supplier any final water loss audit report found by the department to be incomplete, not validated, unattested, or incongruent with known characteristics of water system operations. A water supplier shall resubmit a completed water loss audit report within 90 days of an audit being returned by the department.
- (g) The department shall post all validated water loss audit reports on its internet website in a manner that allows for comparisons across water suppliers. The department shall make the validated water loss audit reports available for public viewing in a timely manner after their receipt.
- (h) Using available funds, the department shall provide technical assistance to guide urban retail water suppliers' water loss detection programs, including, but not limited to, metering techniques, pressure management techniques, condition-based assessment techniques for transmission and distribution pipelines, and utilization of portable and permanent water loss detection devices.
- (i) No earlier than January 1, 2019, and no later than July 1, 2020, the board shall adopt rules requiring urban retail water suppliers to meet performance standards for the volume of water losses. In

adopting these rules, the board shall employ full life-cycle cost accounting to evaluate the costs of meeting the performance standards. The board may consider establishing a minimum allowable water loss threshold that, if reached and maintained by an urban water supplier, would exempt the urban water supplier from further water loss reduction requirements.

10608.35. (a) The department, in coordination with the board, shall conduct necessary studies and investigations and make a recommendation to the Legislature, by January 1, 2020, on the feasibility of developing and enacting water loss reporting requirements for urban wholesale water suppliers.

(b) The studies and investigations shall include an evaluation of the suitability of applying the processes and requirements of Section 10608.34 to urban wholesale water suppliers.

(c) In conducting necessary studies and investigations and developing its recommendation, the department shall solicit broad public participation from stakeholders and other interested persons.

10608.36. Urban wholesale water suppliers shall include in the urban water management plans required pursuant to Part 2.6 (commencing with Section 10610) an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.

10608.40. Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

10608.42. (a) The department shall review the 2015 urban water management plans and report to the Legislature by July 1, 2017, on progress towards achieving a 20-percent reduction in urban water use by December 31, 2020. The report shall include recommendations on changes to water efficiency standards or urban water use targets to achieve the 20-percent reduction and to reflect updated efficiency information and technology changes.

- (b) A report to be submitted pursuant to subdivision (a) shall be submitted in compliance with Section 9795 of the Government Code.

10608.43. The department, in conjunction with the California Urban Water Conservation Council, by April 1, 2010, shall convene a representative task force consisting of academic experts, urban retail water suppliers, environmental organizations, commercial water users, industrial water users, and institutional water users to develop alternative best management practices for commercial, industrial, and institutional users and an assessment of the potential statewide water use efficiency improvement in the commercial, industrial, and institutional sectors that would result from implementation of these best management practices. The taskforce, in conjunction with the department, shall submit a report to the Legislature by April 1, 2012, that shall include a review of multiple sectors within commercial, industrial, and institutional users and that shall recommend water use efficiency standards for commercial, industrial, and institutional users among various sectors of water use. The report shall include, but not be limited to, the following:

- (a) Appropriate metrics for evaluating commercial, industrial, and institutional water use.
- (b) Evaluation of water demands for manufacturing processes, goods, and cooling.
- (c) Evaluation of public infrastructure necessary for delivery of recycled water to the commercial, industrial, and institutional sectors.
- (d) Evaluation of institutional and economic barriers to increased recycled water use within the commercial, industrial, and institutional sectors.
- (e) Identification of technical feasibility and cost of the best management practices to achieve more efficient water use statewide in the commercial, industrial, and institutional sectors that is consistent with the public interest and reflects past investments in water use efficiency.

10608.44. Each state agency shall reduce water use at facilities it operates to support urban retail water suppliers in meeting the target identified in

Section 10608.16.

CHAPTER 4. Agricultural Water Suppliers [10608.48]

10608.48. (a) On or before July 31, 2012, an agricultural water supplier shall implement efficient water management practices pursuant to subdivisions (b) and (c).

- (b) Agricultural water suppliers shall implement both of the following critical efficient management practices:
 - (1) Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).
 - (2) Adopt a pricing structure for water customers based at least in part on quantity delivered.
- (c) Agricultural water suppliers shall implement additional efficient management practices, including, but not limited to, practices to accomplish all of the following, if the measures are locally cost effective and technically feasible:
 - (1) Facilitate alternative land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage.
 - (2) Facilitate use of available recycled water that otherwise would not be used beneficially, meets all health and safety criteria, and does not harm crops or soils.
 - (3) Facilitate the financing of capital improvements for on-farm irrigation systems.
 - (4) Implement an incentive pricing structure that promotes one or more of the following goals:
 - (A) More efficient water use at the farm level.
 - (B) Conjunctive use of groundwater.
 - (C) Appropriate increase of groundwater recharge.
 - (D) Reduction in problem drainage.

- (E) Improved management of environmental resources.
- (F) Effective management of all water sources throughout the year by adjusting seasonal pricing structures based on current conditions.
- (5) Expand line or pipe distribution systems, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage.
- (6) Increase flexibility in water ordering by, and delivery to, water customers within operational limits.
- (7) Construct and operate supplier spill and tailwater recovery systems.
- (8) Increase planned conjunctive use of surface water and groundwater within the supplier service area.
- (9) Automate canal control structures.
- (10) Facilitate or promote customer pump testing and evaluation.
- (11) Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.
- (12) Provide for the availability of water management services to water users. These services may include, but are not limited to, all of the following:
 - (A) On-farm irrigation and drainage system evaluations.
 - (B) Normal year and real-time irrigation scheduling and crop evapotranspiration information.
 - (C) Surface water, groundwater, and drainage water quantity and quality data.
 - (D) Agricultural water management educational programs and materials for farmers, staff, and the public.
- (13) Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow more flexible water deliveries and storage.
- (14) Evaluate and improve the efficiencies of the supplier's

pumps.

- (d) Agricultural water suppliers shall include in the agricultural water management plans required pursuant to Part 2.8 (commencing with Section 10800) a report on which efficient water management practices have been implemented and are planned to be implemented, an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future. If an agricultural water supplier determines that an efficient water management practice is not locally cost effective or technically feasible, the supplier shall submit information documenting that determination.
- (e) The department shall require information about the implementation of efficient water management practices to be reported using a standardized form developed pursuant to Section 10608.52. (f) An agricultural water supplier may meet the requirements of subdivisions (d) and (e) by submitting to the department a water conservation plan submitted to the United States Bureau of Reclamation that meets the requirements described in Section 10828.
- (f) On or before December 31, 2013, December 31, 2016, and December 31, 2021, the department, in consultation with the board, shall submit to the Legislature a report on the agricultural efficient water management practices that have been implemented and are planned to be implemented and an assessment of the manner in which the implementation of those efficient water management practices has affected and will affect agricultural operations, including estimated water use efficiency improvements, if any.
- (g) The department may update the efficient water management practices required pursuant to subdivision (c), in consultation with the Agricultural Water Management Council, the United States Bureau of Reclamation, and the board. All efficient water management practices for agricultural water use pursuant to this chapter shall be adopted or revised by the department only after the department conducts public hearings to allow participation of the diverse geographical areas and interests of the state.

- (h) (1) The department shall adopt regulations that provide for a range of options that agricultural water suppliers may use or implement to comply with the measurement requirement in paragraph (1) of subdivision (b).
- (2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

CHAPTER 5. Sustainable Water Management [10608.50]

10608.50. (a) The department, in consultation with the board, shall promote implementation of regional water resources management practices through increased incentives and removal of barriers consistent with state and federal law. Potential changes may include, but are not limited to, all of the following:

- (1) Revisions to the requirements for urban and agricultural water management plans.
- (2) Revisions to the requirements for integrated regional water management plans.
- (3) Revisions to the eligibility for state water management grants and loans.
- (4) Revisions to state or local permitting requirements that increase water supply opportunities, but do not weaken water quality protection under state and federal law.
- (5) Increased funding for research, feasibility studies, and project construction.
- (6) Expanding technical and educational support for local land use and water management agencies.

- (b) No later than January 1, 2011, and updated as part of the California Water Plan, the department, in consultation with the board, and with public input, shall propose new statewide targets, or review and update existing statewide targets, for regional water resources management practices, including, but not limited to, recycled water, brackish groundwater desalination, and infiltration and direct use of urban stormwater runoff.

CHAPTER 6. Standardized Data Collection [10608.52]

10608.52. (a) The department, in consultation with the board, the California Bay-Delta Authority or its successor agency, the State Department of Public Health, and the Public Utilities Commission, shall develop a single standardized water use reporting form to meet the water use information needs of each agency, including the needs of urban water suppliers that elect to determine and report progress toward achieving targets on a regional basis as provided in subdivision (a) of Section 10608.28.

- (b) At a minimum, the form shall be developed to accommodate information sufficient to assess an urban water supplier's compliance with conservation targets pursuant to Section 10608.24 and an agricultural water supplier's compliance with implementation of efficient water management practices pursuant to subdivision (a) of Section 10608.48. The form shall accommodate reporting by urban water suppliers on an individual or regional basis as provided in subdivision (a) of Section 10608.28.

CHAPTER 7. Funding Provisions [10608.56 – 10608.60]

10608.56. (a) On and after July 1, 2016, an urban retail water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

- (b) On and after July 1, 2013, an agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.
- (c) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita

reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for achieving the per capita reductions. The supplier may request grant or loan funds to achieve the per capita reductions to the extent the request is consistent with the eligibility requirements applicable to the water funds.

- (d) Notwithstanding subdivision (b), the department shall determine that an agricultural water supplier is eligible for a water grant or loan even though the supplier is not implementing all of the efficient water management practices described in Section 10608.48, if the agricultural water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the efficient water management practices. The supplier may request grant or loan funds to implement the efficient water management practices to the extent the request is consistent with the eligibility requirements applicable to the water funds.
- (e) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval documentation demonstrating that its entire service area qualifies as a disadvantaged community.
- (f) The department shall not deny eligibility to an urban retail water supplier or agricultural water supplier in compliance with the requirements of this part and Part 2.8 (commencing with Section 10800), that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the requirements of this part or Part 2.8 (commencing with Section 10800).

10608.60. (a) It is the intent of the Legislature that funds made available by Section 75026 of the Public Resources Code should be expended, consistent with Division 43 (commencing with Section 75001) of the Public

Resources Code and upon appropriation by the Legislature, for grants to implement this part. In the allocation of funding, it is the intent of the Legislature that the department give consideration to disadvantaged communities to assist in implementing the requirements of this part.

- (b) It is the intent of the Legislature that funds made available by Section 75041 of the Public Resources Code, should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for direct expenditures to implement this part.

CHAPTER 8. Quantifying Agricultural Water Use Efficiency [10608.64]

10608.64. The department, in consultation with the Agricultural Water Management Council, academic experts, and other stakeholders, shall develop a methodology for quantifying the efficiency of agricultural water use. Alternatives to be assessed shall include, but not be limited to, determination of efficiency levels based on crop type or irrigation system distribution uniformity. On or before December 31, 2011, the department shall report to the Legislature on a proposed methodology and a plan for implementation. The plan shall include the estimated implementation costs and the types of data needed to support the methodology. Nothing in this section authorizes the department to implement a methodology established pursuant to this section.

PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION [10608 – 10609.42]

CHAPTER 9. Urban Water Use Objectives and Water Use Reporting [10609 – 10609.38]

10609. (a) The Legislature finds and declares that this chapter establishes a method to estimate the aggregate amount of water that would have been delivered the previous year by an urban retail water supplier if all that water had been used efficiently. This estimated aggregate water use is the urban retail water supplier's urban water use objective. The method is based on water use efficiency standards and local service area characteristics for that year. By comparing the amount of water actually used in the previous year with the urban water use objective, local urban water suppliers will be in a better position to help eliminate unnecessary use of water; that is, water used in excess of that needed to accomplish the intended beneficial use.

(b) The Legislature further finds and declares all of the following:

(1) This chapter establishes standards and practices for the following water uses:

- (A) Indoor residential use.
- (B) Outdoor residential use.
- (C) CII water use.
- (D) Water losses.
- (E) Other unique local uses and situations that can have a material effect on an urban water supplier's total water use.

(2) This chapter further does all of the following:

- (A) Establishes a method to calculate each urban water use objective.
- (B) Considers recycled water quality in establishing efficient irrigation standards.
- (C) Requires the department to provide or otherwise identify data regarding the unique local conditions to support the calculation of an urban water use objective.
- (D) Provides for the use of alternative sources of data if alternative sources are shown to be as accurate as, or more accurate than, the data provided by the department.
- (E) Requires annual reporting of the previous year's water use with the urban water use objective.
- (F) Provides a bonus incentive for the amount of potable recycled water used the previous year when comparing the previous year's water use with the urban water use objective, of up to 10 percent of the urban water use objective.

(3) This chapter requires the department and the board to solicit broad public participation from stakeholders and other interested persons in the development of the standards and the adoption of regulations pursuant to this chapter.

- (4) This chapter preserves the Legislature's authority over long-term water use efficiency target setting and ensures appropriate legislative oversight of the implementation of this chapter by doing all of the following:
 - (A) Requiring the Legislative Analyst to conduct a review of the implementation of this chapter, including compliance with the adopted standards and regulations, accuracy of the data, use of alternate data, and other issues the Legislative Analyst deems appropriate.
 - (B) Stating legislative intent that the director of the department and the chairperson of the board appear before the appropriate Senate and Assembly policy committees to report on progress in implementing this chapter.
 - (C) Providing one-time-only authority to the department and board to adopt water use efficiency standards, except as explicitly provided in this chapter. Authorization to update the standards shall require separate legislation.
- (c) It is the intent of the Legislature that the following principles apply to the development and implementation of long-term standards and urban water use objectives:
 - (1) Local urban retail water suppliers should have primary responsibility for meeting standards-based water use targets, and they shall retain the flexibility to develop their water supply portfolios, design and implement water conservation strategies, educate their customers, and enforce their rules.
 - (2) Long-term standards and urban water use objectives should advance the state's goals to mitigate and adapt to climate change.
 - (3) Long-term standards and urban water use objectives should acknowledge the shade, air quality, and heat-island reduction benefits provided to communities by trees through the support of water-efficient irrigation practices that keep trees healthy.

- (4) The state should identify opportunities for streamlined reporting, eliminate redundant data submissions, and incentivize open access to data collected by urban and agricultural water suppliers.

10609.2. (a) The board, in coordination with the department, shall adopt long-term standards for the efficient use of water pursuant to this chapter on or before June 30, 2022.

(b) Standards shall be adopted for all of the following:

- (1) Outdoor residential water use.
- (2) Outdoor irrigation of landscape areas with dedicated irrigation meters in connection with CII water use.
- (3) A volume for water loss.

(c) When adopting the standards under this section, the board shall consider the policies of this chapter and the proposed efficiency standards' effects on local wastewater management, developed and natural parklands, and urban tree health. The standards and potential effects shall be identified by May 30, 2022. The board shall allow for public comment on potential effects identified by the board under this subdivision.

(d) The long-term standards shall be set at a level designed so that the water use objectives, together with other demands excluded from the long-term standards such as CII indoor water use and CII outdoor water use not connected to a dedicated landscape meter, would exceed the statewide conservation targets required pursuant to Chapter 3 (commencing with Section 10608.16).

(e) The board, in coordination with the department, shall adopt by regulation variances recommended by the department pursuant to Section 10609.14 and guidelines and methodologies pertaining to the calculation of an urban retail water supplier's urban water use objective recommended by the department pursuant to Section 10609.16.

10609.4. (a) (1) Until January 1, 2025, the standard for indoor residential water use shall be 55 gallons per capita daily.

(2) Beginning January 1, 2025, and until January 1, 2030, the

standard for indoor residential water use shall be the greater of 52.5 gallons per capita daily or a standard recommended pursuant to subdivision (b).

(3) Beginning January 1, 2030, the standard for indoor residential water use shall be the greater of 50 gallons per capita daily or a standard recommended pursuant to subdivision (b).

(b) (1) The department, in coordination with the board, shall conduct necessary studies and investigations and may jointly recommend to the Legislature a standard for indoor residential water use that more appropriately reflects best practices for indoor residential water use than the standard described in subdivision (a). A report on the results of the studies and investigations shall be made to the chairpersons of the relevant policy committees of each house of the Legislature by January 1, 2021, and shall include information necessary to support the recommended standard, if there is one. The studies and investigations shall also include an analysis of the benefits and impacts of how the changing standard for indoor residential water use will impact water and wastewater management, including potable water usage, wastewater, recycling and reuse systems, infrastructure, operations, and supplies.

(2) The studies, investigations, and report described in paragraph (1) shall include collaboration with, and input from, a broad group of stakeholders, including, but not limited to, environmental groups, experts in indoor plumbing, and water, wastewater, and recycled water agencies.

10609.6. (a) (1) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, standards for outdoor residential use for adoption by the board in accordance with this chapter.

(2) (A) The standards shall incorporate the principles of the model water efficient landscape ordinance adopted by the department pursuant to the Water Conservation in Landscaping Act (Article 10.8 (commencing with Section 65591) of Chapter 3 of Division 1 of Title 7 of the Government Code).

(B) The standards shall apply to irrigable lands.

- (C) The standards shall include provisions for swimming pools, spas, and other water features. Ornamental water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, shall be analyzed separately from swimming pools and spas.
- (b) The department shall, by January 1, 2021, provide each urban retail water supplier with data regarding the area of residential irrigable lands in a manner that can reasonably be applied to the standards adopted pursuant to this section.
- (c) The department shall not recommend standards pursuant to this section until it has conducted pilot projects or studies, or some combination of the two, to ensure that the data provided to local agencies are reasonably accurate for the data's intended uses, taking into consideration California's diverse landscapes and community characteristics.

10609.8. (a) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, standards for outdoor irrigation of landscape areas with dedicated irrigation meters or other means of calculating outdoor irrigation use in connection with CII water use for adoption by the board in accordance with this chapter.

- (b) The standards shall incorporate the principles of the model water efficient landscape ordinance adopted by the department pursuant to the Water Conservation in Landscaping Act (Article 10.8 (commencing with Section 65591) of Chapter 3 of Division 1 of Title 7 of the Government Code).
- (c) The standards shall include an exclusion for water for commercial agricultural use meeting the definition of subdivision (b) of Section 51201 of the Government Code.

10609.9. For purposes of Sections 10609.6 and 10609.8, "principles of the model water efficient landscape ordinance" means those provisions of the model water efficient landscape ordinance applicable to the establishment or determination of the amount of water necessary to efficiently irrigate both new and existing landscapes. These provisions include, but are not limited to, all of the following:

- (a) Evapotranspiration adjustment factors, as applicable.
- (b) Landscape area.
- (c) Maximum applied water allowance.
- (d) Reference evapotranspiration.
- (e) Special landscape areas, including provisions governing evapotranspiration adjustment factors for different types of water used for irrigating the landscape.

10609.10. (a) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, performance measures for CII water use for adoption by the board in accordance with this chapter.

- (b) Prior to recommending performance measures for CII water use, the department shall solicit broad public participation from stakeholders and other interested persons relating to all of the following:
 - (1) Recommendations for a CII water use classification system for California that address significant uses of water.
 - (2) Recommendations for setting minimum size thresholds for converting mixed CII meters to dedicated irrigation meters, and evaluation of, and recommendations for, technologies that could be used in lieu of requiring dedicated irrigation meters.
 - (3) Recommendations for CII water use best management practices, which may include, but are not limited to, water audits and water management plans for those CII customers that exceed a recommended size, volume of water use, or other threshold.
- (c) Recommendations of appropriate performance measures for CII water use shall be consistent with the October 21, 2013, report to the Legislature by the Commercial, Industrial, and Institutional Task Force entitled "Water Use Best Management Practices," including the technical and financial feasibility recommendations provided in that report, and shall support the economic productivity of California's commercial, industrial, and institutional sectors.

- (d) (1) The board, in coordination with the department, shall adopt performance measures for CII water use on or before June 30, 2022.

- (a) Each urban retail water supplier shall implement the performance measures adopted by the board pursuant to paragraph (1).

10609.12. The standards for water loss for urban retail water suppliers shall be the standards adopted by the board pursuant to subdivision (i) of Section 10608.34.

10609.14. (a) The department, in coordination with the board, shall conduct necessary studies and investigations and, no later than October 1, 2021, recommend for adoption by the board in accordance with this chapter appropriate variances for unique uses that can have a material effect on an urban retail water supplier's urban water use objective.

- (b) Appropriate variances may include, but are not limited to, allowances for the following:
 - (1) Significant use of evaporative coolers.
 - (2) Significant populations of horses and other livestock.
 - (3) Significant fluctuations in seasonal populations.
 - (4) Significant landscaped areas irrigated with recycled water having high levels of total dissolved solids.
 - (5) Significant use of water for soil compaction and dust control.
 - (6) Significant use of water to supplement ponds and lakes to sustain wildlife.
 - (7) Significant use of water to irrigate vegetation for fire protection.
 - (8) Significant use of water for commercial or noncommercial agricultural use.
- (c) The department, in recommending variances for adoption by the board, shall also recommend a threshold of significance for each recommended variance.
- (d) Before including any specific variance in calculating an urban retail water supplier's water use objective, the urban retail water supplier shall request and receive approval by the board for the inclusion of that variance.
- (e) The board shall post on its Internet Web site all of the following:

- (1) A list of all urban retail water suppliers with approved variances.
- (2) The specific variance or variances approved for each urban retail water supplier.
- (3) The data supporting approval of each variance.

10609.15. To help streamline water data reporting, the department and the board shall do all of the following:

- (a) Identify urban water reporting requirements shared by both agencies, and post on each agency's Internet Web site how the data is used for planning, regulatory, or other purposes.
- (b) Analyze opportunities for more efficient publication of urban water reporting requirements within each agency, and analyze how each agency can integrate various data sets in a publicly accessible location, identify priority actions, and implement priority actions identified in the analysis.
- (c) Make appropriate data pertaining to the urban water reporting requirements that are collected by either agency available to the public according to the principles and requirements of the Open and Transparent Water Data Act (Part 4.9 (commencing with Section 12400)).

10609.16. The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, guidelines and methodologies for the board to adopt that identify how an urban retail water supplier calculates its urban water use objective. The guidelines and methodologies shall address, as necessary, all of the following:

- (a) Determining the irrigable lands within the urban retail water supplier's service area.
- (b) Updating and revising methodologies described pursuant to subparagraph (A) of paragraph (1) of subdivision (h) of Section 10608.20, as appropriate, including methodologies for calculating the population in an urban retail water supplier's service area.
- (c) Using landscape area data provided by the department or alternative data.

- (d) Incorporating precipitation data and climate data into estimates of a urban retail water supplier's outdoor irrigation budget for its urban water use objective.
- (e) Estimating changes in outdoor landscape area and population, and calculating the urban water use objective, for years when updated landscape imagery is not available from the department.
- (f) Determining acceptable levels of accuracy for the supporting data, the urban water use objective, and compliance with the urban water use objective.

10609.18. The department and the board shall solicit broad public participation from stakeholders and other interested persons in the development of the standards and the adoption of regulations pursuant to this chapter. The board shall hold at least one public meeting before taking any action on any standard or variance recommended by the department.

10609.20. (a) Each urban retail water supplier shall calculate its urban water use objective no later than January 1, 2024, and by January 1 every year thereafter.

- (b) The calculation shall be based on the urban retail water supplier's water use conditions for the previous calendar or fiscal year.
- (c) Each urban water supplier's urban water use objective shall be composed of the sum of the following:
 - (1) Aggregate estimated efficient indoor residential water use.
 - (2) Aggregate estimated efficient outdoor residential water use.
 - (3) Aggregate estimated efficient outdoor irrigation of landscape areas with dedicated irrigation meters or equivalent technology in connection with CII water use.
 - (4) Aggregate estimated efficient water losses.
 - (5) Aggregate estimated water use in accordance with variances, as appropriate.
- (d) (1) An urban retail water supplier that delivers water from a groundwater basin, reservoir, or other source that is augmented by potable reuse water may adjust its urban water use objective by a bonus incentive calculated pursuant to this subdivision.

- (2) The water use objective bonus incentive shall be the volume of its potable reuse delivered to residential water users and to landscape areas with dedicated irrigation meters in connection with CII water use, on an acre-foot basis.
- (3) The bonus incentive pursuant to paragraph (1) shall be limited in accordance with one of the following:
 - (A) The bonus incentive shall not exceed 15 percent of the urban water supplier's water use objective for any potable reuse water produced at an existing facility.
 - (B) The bonus incentive shall not exceed 10 percent of the urban water supplier's water use objective for any potable reuse water produced at any facility that is not an existing facility.
- (4) For purposes of this subdivision, "existing facility" means a facility that meets all of the following:
 - (A) The facility has a certified environmental impact report, mitigated negative declaration, or negative declaration on or before January 1, 2019.
 - (B) The facility begins producing and delivering potable reuse water on or before January 1, 2022.
 - (C) The facility uses microfiltration and reverse osmosis technologies to produce the potable reuse water.
- (e) (1) The calculation of the urban water use objective shall be made using landscape area and other data provided by the department and pursuant to the standards, guidelines, and methodologies adopted by the board. The department shall provide data to the urban water supplier at a level of detail sufficient to allow the urban water supplier to verify its accuracy at the parcel level.
- (2) Notwithstanding paragraph (1), an urban retail water supplier may use alternative data in calculating the urban water use objective if the supplier demonstrates to the department that the alternative data are equivalent, or superior, in quality and accuracy to the data provided by the department. The department may provide technical assistance to an urban retail water supplier in evaluating whether the alternative data are appropriate for use in calculating the supplier's urban water use objective.

10609.21. (a) For purposes of Section 10609.20, and notwithstanding paragraph (4) of subdivision (d) of Section 10609.20, “existing facility” also includes the North City Project, phase one of the Pure Water San Diego Program, for which an environmental impact report was certified on April 10, 2018.

(b) This section shall become operative on January 1, 2019.

10609.22. (a) An urban retail water supplier shall calculate its actual urban water use no later than January 1, 2024, and by January 1 every year thereafter.

(b) The calculation shall be based on the urban retail water supplier’s water use for the previous calendar or fiscal year.

(c) Each urban water supplier’s urban water use shall be composed of the sum of the following:

- (1) Aggregate residential water use.
- (2) Aggregate outdoor irrigation of landscape areas with dedicated irrigation meters in connection with CII water use.
- (3) Aggregate water losses.

10609.24. (a) An urban retail water supplier shall submit a report to the department no later than January 1, 2024, and by January 1 every year thereafter. The report shall include all of the following:

- (1) The urban water use objective calculated pursuant to Section 10609.20 along with relevant supporting data.
- (2) The actual urban water use calculated pursuant to Section 10609.22 along with relevant supporting data.
- (3) Documentation of the implementation of the performance measures for CII water use.
- (4) A description of the progress made towards meeting the urban water use objective.
- (5) The validated water loss audit report conducted pursuant to Section 10608.34.

(b) The department shall post the reports and information on its internet website.

- (c) The board may issue an information order or conservation order to, or impose civil liability on, an entity or individual for failure to submit a report required by this section.

10609.25. As part of the first report submitted to the department by an urban retail water supplier no later than January 1, 2024, pursuant to subdivision (a) of Section 10609.24, each urban retail water supplier shall provide a narrative that describes the water demand management measures that the supplier plans to implement to achieve its urban water use objective by January 1, 2027.

10609.26. (a) (1) On and after January 1, 2024, the board may issue informational orders pertaining to water production, water use, and water conservation to an urban retail water supplier that does not meet its urban water use objective required by this chapter. Informational orders are intended to obtain information on supplier activities, water production, and conservation efforts in order to identify technical assistance needs and assist urban water suppliers in meeting their urban water use objectives.

- (2) In determining whether to issue an informational order, the board shall consider the degree to which the urban retail water supplier is not meeting its urban water use objective, information provided in the report required by Section 10609.24, and actions the urban retail water supplier has implemented or will implement in order to help meet the urban water use objective.

- (3) The board shall share information received pursuant to this subdivision with the department.

- (4) An urban water supplier may request technical assistance from the department. The technical assistance may, to the extent available, include guidance documents, tools, and data.

- (b) On and after January 1, 2025, the board may issue a written notice to an urban retail water supplier that does not meet its urban water use objective required by this chapter. The written notice may warn the urban retail water supplier that it is not meeting its urban water use objective described in Section 10609.20 and is not making adequate progress in meeting the urban water use objective, and may request that the urban retail water supplier

address areas of concern in its next annual report required by Section 10609.24. In deciding whether to issue a written notice, the board may consider whether the urban retail water supplier has received an informational order, the degree to which the urban retail water supplier is not meeting its urban water use objective, information provided in the report required by Section 10609.24, and actions the urban retail water supplier has implemented or will implement in order to help meet its urban water use objective.

- (c) (1) On and after January 1, 2026, the board may issue a conservation order to an urban retail water supplier that does not meet its urban water use objective. A conservation order may consist of, but is not limited to, referral to the department for technical assistance, requirements for education and outreach, requirements for local enforcement, and other efforts to assist urban retail water suppliers in meeting their urban water use objective.
 - (2) In issuing a conservation order, the board shall identify specific deficiencies in an urban retail water supplier's progress towards meeting its urban water use objective, and identify specific actions to address the deficiencies.
 - (3) The board may request that the department provide an urban retail water supplier with technical assistance to support the urban retail water supplier's actions to remedy the deficiencies.
- (d) A conservation order issued in accordance with this chapter may include requiring actions intended to increase water-use efficiency, but shall not curtail or otherwise limit the exercise of a water right, nor shall it require the imposition of civil liability pursuant to Section 377.

10609.27. Notwithstanding Section 10609.26, the board shall not issue an information order, written notice, or conservation order pursuant to Section 10609.26 if both of the following conditions are met:

- (a) The board determines that the urban retail water supplier is not meeting its urban water use objective solely because the volume of water loss exceeds the urban retail water supplier's standard for water loss.

- (b) Pursuant to Section 10608.34, the board is taking enforcement action against the urban retail water supplier for not meeting the performance standards for the volume of water losses.

10609.28. The board may issue a regulation or informational order requiring a wholesale water supplier, an urban retail water supplier, or a distributor of a public water supply, as that term is used in Section 350, to provide a monthly report relating to water production, water use, or water conservation.

10609.30. On or before January 10, 2024, the Legislative Analyst shall provide to the appropriate policy committees of both houses of the Legislature and the public a report evaluating the implementation of the water use efficiency standards and water use reporting pursuant to this chapter. The board and the department shall provide the Legislative Analyst with the available data to complete this report.

- (a) The report shall describe all of the following:

- (1) The rate at which urban retail water users are complying with the standards, and factors that might facilitate or impede their compliance.
- (2) The accuracy of the data and estimates being used to calculate urban water use objectives.
- (3) Indications of the economic impacts, if any, of the implementation of this chapter on urban water suppliers and urban water users, including CII water users.
- (4) The frequency of use of the bonus incentive, the volume of water associated with the bonus incentive, value to urban water suppliers of the bonus incentive, and any implications of the use of the bonus incentive on water use efficiency.
- (5) The early indications of how implementing this chapter might impact the efficiency of statewide urban water use.
- (6) Recommendations, if any, for improving statewide urban water use efficiency and the standards and practices described in this chapter.
- (7) Any other issues the Legislative Analyst deems appropriate.

10609.32. It is the intent of the Legislature that the chairperson of the board and the director of the department appear before the appropriate policy committees of both houses of the Legislature on or around January 1, 2026, and report on the implementation of the water use efficiency standards and water use reporting pursuant to this chapter. It is the intent of the Legislature that the topics to be covered include all of the following:

- (a) The rate at which urban retail water suppliers are complying with the standards, and factors that might facilitate or impede their compliance.
- (b) What enforcement actions have been taken, if any.
- (c) The accuracy of the data and estimates being used to calculate urban water use objectives.
- (d) Indications of the economic impacts, if any, of the implementation of this chapter on urban water suppliers and urban water users, including CII water users.
- (e) The frequency of use of the bonus incentive, the volume of water associated with the bonus incentive, value to urban water suppliers of the bonus incentive, and any implications of the use of the bonus incentive on water use efficiency.
- (f) An assessment of how implementing this chapter is affecting the efficiency of statewide urban water use.

10609.34. Notwithstanding Section 15300.2 of Title 14 of the California Code of Regulations, an action of the board taken under this chapter shall be deemed to be a Class 8 action, within the meaning of Section 15308 of Title 14 of the California Code of Regulations, provided that the action does not involve relaxation of existing water conservation or water use standards.

10609.36. (a) Nothing in this chapter shall be construed to determine or alter water rights. Sections 1010 and 1011 apply to water conserved through implementation of this chapter.

- (b) Nothing in this chapter shall be construed to authorize the board to update or revise water use efficiency standards authorized by this chapter except as explicitly provided in this chapter. Authorization to update the standards beyond that explicitly provided in this chapter shall require separate legislation.

- (c) Nothing in this chapter shall be construed to limit or otherwise affect the use of recycled water as seawater barriers for groundwater salinity management.

10609.38. The board may waive the requirements of this chapter for a period of up to five years for any urban retail water supplier whose water deliveries are significantly affected by changes in water use as a result of damage from a disaster such as an earthquake or fire. In establishing the period of a waiver, the board shall take into consideration the breadth of the damage and the time necessary for the damaged areas to recover from the disaster.

PART 2.6. URBAN WATER MANAGEMENT PLANNING

CHAPTER 1. General Declaration and Policy [10610 – 10610.4]

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

- (1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.
- (2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.
- (3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate, and increasing long-term water conservation among Californians, improving water use efficiency within the state's communities and agricultural production, and strengthening local and regional drought planning are critical to California's resilience to drought and climate change.
- (4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years now and into the

foreseeable future, and every urban water supplier should collaborate closely with local land-use authorities to ensure water demand forecasts are consistent with current land-use planning.

- (5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.
 - (6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.
 - (7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.
 - (8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.
 - (9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.
- (b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

- (a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.
- (b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.
- (c) Urban water suppliers shall be required to develop water management plans to achieve the efficient use of available supplies and strengthen local drought planning.

CHAPTER 2. Definitions [10611 – 10618]

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.3. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Drought risk assessment" means a method that examines water shortage risks based on the driest five-year historic sequence for the agency's water supply, as described in subdivision (b) of Section 10635.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

10617.5. "Water shortage contingency plan" means a document that incorporates the provisions detailed in subdivision (a) of Section 10632 and is subsequently adopted by an urban water supplier pursuant to this article.

10618. "Water supply and demand assessment" means a method that looks at current year and one or more dry year supplies and demands for determining water shortage risks, as described in Section 10632.1.

CHAPTER 3. Urban Water Management Plans

ARTICLE 1. General Provisions [10620 – 10621]

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

- (b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.
- (c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.
- (d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce

preparation costs and contribute to the achievement of conservation, efficient water use, and improved local drought resilience.

- (2) Notwithstanding paragraph (1), each urban water supplier shall develop its own water shortage contingency plan, but an urban water supplier may incorporate, collaborate, and otherwise share information with other urban water suppliers or other governing entities participating in an areawide, regional, watershed, or basinwide urban water management plan, an agricultural management plan, or groundwater sustainability plan development.
- (3) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.
- (e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.
- (f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.

- (b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.
- (c) An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage

contingency plan as part of the supplier's general rate case filings.

- (d) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).
- (e) Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.
- (f) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

CHAPTER 3. Urban Water Management Plans

ARTICLE 2. Contents of Plans [10630 – 10634]

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied, while accounting for impacts from climate change.

10630.5. Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

10631. A plan shall be adopted in accordance with this chapter that shall do all of the following:

- (a) Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including,

where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

- (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:
 - (1) A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.
 - (2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.
 - (3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.
 - (4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:
 - (A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.
 - (B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater.

For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).

- (C) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.
 - (D) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.
- (c) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.
- (d) (1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors,

including, but not necessarily limited to, all of the following:

- (A) Single-family residential.
 - (B) Multifamily.
 - (C) Commercial.
 - (D) Industrial.
 - (E) Institutional and governmental.
 - (F) Landscape.
 - (G) Sales to other agencies.
 - (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
 - (I) Agricultural.
 - (J) Distribution system water loss.
- (2) The water use projections shall be in the same five-year increments described in subdivision (a).
- (3) (A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.
- (B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.
- (C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.
- (4) (A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

- (B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:
 - (i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.
 - (ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.
- (e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:
 - (1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.
 - (B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:
 - (i) Water waste prevention ordinances.
 - (ii) Metering.
 - (iii) Conservation pricing.
 - (iv) Public education and outreach.
 - (v) Programs to assess and manage distribution system real loss.
 - (vi) Water conservation program coordination and staffing support.
 - (vii) Other demand management measures that have a significant impact on water use as measured in

gallons per capita per day, including innovative measures, if implemented.

- (2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.
- (f) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.
- (g) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.
- (h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

10631.1. (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

10631.2. (a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:

- (1) An estimate of the amount of energy used to extract or divert water supplies.
- (2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.
- (3) An estimate of the amount of energy used to treat water supplies.
- (4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.
- (5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.
- (6) An estimate of the amount of energy used to place water into or withdraw from storage.
- (7) Any other energy-related information the urban water supplier deems appropriate.

(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.

- (c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

10632. (a) Every urban water supplier shall prepare and adopt a water shortage contingency plan as part of its urban water management plan that consists of each of the following elements:

- (1) The analysis of water supply reliability conducted pursuant to Section 10635.
- (2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:
 - (A) The written decision making process that an urban water supplier will use each year to determine its water supply reliability.
 - (B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:
 - (i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.
 - (ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.
 - (iii) Existing infrastructure capabilities and plausible constraints.
 - (iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.
 - (v) A description and quantification of each source of water supply.

- (3) (A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.
 - (B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.
- (4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:
 - (A) Locally appropriate supply augmentation actions.
 - (B) Locally appropriate demand reduction actions to adequately respond to shortages.
 - (C) Locally appropriate operational changes.
 - (D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.
 - (E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.
- (5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

- (A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.
 - (B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.
 - (C) Any other relevant communications.
- (6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.
- (7) (A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.
 - (A) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.
 - (B) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.
- (8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:
 - (A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).
 - (B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

- (C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.
- (9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.
- (10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.
- (b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.
- (c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

10632.1. An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

10632.2. An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in

subdivision (a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1. Nothing in this section prohibits an urban water supplier from taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.

10632.3. It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.

10632.5. (a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

- (b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.
- (c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

- (a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the

amount of wastewater collected and treated and the methods of wastewater disposal.

- (b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.
- (c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.
- (d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.
- (e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.
- (f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.
- (g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

CHAPTER 3. Urban Water Management Plans**ARTICLE 2.5. Water Service Reliability [10635]**

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:

- (1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.
- (2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.
- (3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.
- (4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate

change conditions, anticipated regulatory changes, and other locally applicable criteria.

- (d) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.
- (e) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.
- (f) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

CHAPTER 3. Urban Water Management Plans

ARTICLE 3. Adoption and Implementation of Plans [10640 – 10645]

10640. (a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

- (b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan or a water shortage contingency plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its

water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

- (c) (1) (A) Notwithstanding Section 10231.5 of the Government Code, the department shall prepare and submit to the Legislature, on or before July 1, in the years ending in seven and two, a report summarizing the status of the plans and water shortage contingency plans adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans and water shortage contingency plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan and water shortage contingency plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans and water shortage contingency plans submitted pursuant to this part.

(B) The department shall prepare and submit to the board, on or before September 30 of each year, a report summarizing the submitted water supply and demand assessment results along with appropriate reported water shortage conditions and the regional and statewide analysis of water supply conditions developed by the department. As part of the report, the department shall provide a summary and, as appropriate, urban water supplier specific information regarding various shortage response actions implemented as a result of annual supplier-specific water supply and demand assessments performed pursuant to Section 10632.1.

(C) The department shall submit the report to the Legislature for the 2015 plans by July 1, 2017, and the report to the Legislature for the 2020 plans and water shortage contingency plans by July 1, 2022.

- (2) A report to be submitted pursuant to subparagraph (A) of paragraph (1) shall be submitted in compliance with Section 9795 of the Government Code.

- (d) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

10645. (a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

- (b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

CHAPTER 4. Miscellaneous Provisions [10650 – 10657]

10650. Any actions or proceedings, other than actions by the board, to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

- (a) An action or proceeding alleging failure to adopt a plan or a water shortage contingency plan shall be commenced within 18 months after that adoption is required by this part.
- (b) Any action or proceeding alleging that a plan or water shortage contingency plan, or action taken pursuant to either, does not comply with this part shall be commenced within 90 days after filing of the plan or water shortage contingency plan or an amendment to either pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan or a water shortage contingency plan, or an action taken pursuant to either by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the

preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the board and the Public Utilities Commission, for the preparation of water management plans, water shortage contingency plans, or conservation plans; provided, that if the board or the Public Utilities Commission requires additional information concerning water conservation, drought response measures, or financial conditions to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan that complies with analogous federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its urban water management plan, its drought risk assessment, its water supply and demand assessment, and its water shortage contingency plan and implementing the reasonable water conservation measures included in either of the plans.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier is not eligible for a water grant or loan awarded or administered by the state unless the urban water supplier complies with this part.

10657. The department may adopt regulations regarding the definitions of water, water use, and reporting periods, and may adopt any other regulations deemed necessary or desirable to implement this part. In developing regulations pursuant to this section, the department shall solicit broad public participation from stakeholders and other interested persons.

Appendix C

California Water Code

Sustainable Water Use and Demand Reduction (SB X7-7)

This document presents the Water Code sections associated with the Sustainable Water Use and Demand Reduction (SB X7-7).

California Water Code

Sustainable Water Use and Demand Reduction

California Water Code Division 6, Part 2.55.

Chapter 1. General Declarations and Policy	§10608-10608.8
Chapter 2. Definitions	§10608.12
Chapter 3. Urban Retail Water Suppliers	§10608.16-10608.44
Chapter 4. Agricultural Water Suppliers	§10608.48
Chapter 5. Sustainable Water Management	§10608.50
Chapter 6 Standardized Data Collection	§10608.52
Chapter 7 Funding Provisions	§10608.56-10608.60
Chapter 8 Quantifying Agricultural Water Use Efficiency	§10608.64

Chapter 1. General Declarations and Policy

SECTION 10608-10608.8

10608. The Legislature finds and declares all of the following:

- (a) Water is a public resource that the California Constitution protects against waste and unreasonable use.
- (b) Growing population, climate change, and the need to protect and grow California's economy while protecting and restoring our fish and wildlife habitats make it essential that the state manage its water resources as efficiently as possible.
- (c) Diverse regional water supply portfolios will increase water supply reliability and reduce dependence on the Delta.
- (d) Reduced water use through conservation provides significant energy and environmental benefits, and can help protect water quality, improve streamflows, and reduce greenhouse gas emissions.
- (e) The success of state and local water conservation programs to increase efficiency of water use is best determined on the basis of measurable outcomes related to water use or efficiency.
- (f) Improvements in technology and management practices offer the potential for increasing water efficiency in California over time, providing an essential water management tool to meet the need for water for urban, agricultural, and environmental uses.
- (g) The Governor has called for a 20 percent per capita reduction in urban water use statewide by 2020.

- (h) The factors used to formulate water use efficiency targets can vary significantly from location to location based on factors including weather, patterns of urban and suburban development, and past efforts to enhance water use efficiency.
- (i) Per capita water use is a valid measure of a water provider's efforts to reduce urban water use within its service area. However, per capita water use is less useful for measuring relative water use efficiency between different water providers. Differences in weather, historical patterns of urban and suburban development, and density of housing in a particular location need to be considered when assessing per capita water use as a measure of efficiency.

10608.4. It is the intent of the Legislature, by the enactment of this part, to do all of the following:

- (a) Require all water suppliers to increase the efficiency of use of this essential resource.
- (b) Establish a framework to meet the state targets for urban water conservation identified in this part and called for by the Governor.
- (c) Measure increased efficiency of urban water use on a per capita basis.
- (d) Establish a method or methods for urban retail water suppliers to determine targets for achieving increased water use efficiency by the year 2020, in accordance with the Governor's goal of a 20-percent reduction.
- (e) Establish consistent water use efficiency planning and implementation standards for urban water suppliers and agricultural water suppliers.
- (f) Promote urban water conservation standards that are consistent with the California Urban Water Conservation Council's adopted best management practices and the requirements for demand management in Section 10631.
- (g) Establish standards that recognize and provide credit to water suppliers that made substantial capital investments in urban water conservation since the drought of the early 1990s.
- (h) Recognize and account for the investment of urban retail water suppliers in providing recycled water for beneficial uses.
- (i) Require implementation of specified efficient water management practices for agricultural water suppliers.
- (j) Support the economic productivity of California's agricultural, commercial, and industrial sectors.

(k) Advance regional water resources management.

10608.8. (a) (1) Water use efficiency measures adopted and implemented pursuant to this part or Part 2.8 (commencing with Section 10800) are water conservation measures subject to the protections provided under Section 1011.

(2) Because an urban agency is not required to meet its urban water use target until 2020 pursuant to subdivision (b) of Section 10608.24, an urban retail water supplier's failure to meet those targets shall not establish a violation of law for purposes of any state administrative or judicial proceeding prior to January 1, 2021. Nothing in this paragraph limits the use of data reported to the department or the board in litigation or an administrative proceeding. This paragraph shall become inoperative on January 1, 2021.

(3) To the extent feasible, the department and the board shall provide for the use of water conservation reports required under this part to meet the requirements of Section 1011 for water conservation reporting.

(b) This part does not limit or otherwise affect the application of Chapter 3.5 (commencing with Section 11340), Chapter 4 (commencing with Section 11370), Chapter 4.5 (commencing with Section 11400), and Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code.

(c) This part does not require a reduction in the total water used in the agricultural or urban sectors, because other factors, including, but not limited to, changes in agricultural economics or population growth may have greater effects on water use. This part does not limit the economic productivity of California's agricultural, commercial, or industrial sectors.

(d) The requirements of this part do not apply to an agricultural water supplier that is a party to the Quantification Settlement Agreement, as defined in subdivision (a) of Section 1 of Chapter 617 of the Statutes of 2002, during the period within which the Quantification Settlement Agreement remains in effect. After the expiration of the Quantification Settlement Agreement, to the extent conservation water projects implemented as part of the Quantification Settlement Agreement remain in effect, the conserved water created as part of those projects shall be credited against the obligations of the agricultural water supplier pursuant to this part.

Chapter 2 Definitions

SECTION 10608.12

10608.12. Unless the context otherwise requires, the following definitions govern the construction of this part:

- (a) "Agricultural water supplier" means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. "Agricultural water supplier" includes a supplier or contractor for water, regardless of the basis of right, that distributes or sells water for ultimate resale to customers. "Agricultural water supplier" does not include the department.
- (b) "Base daily per capita water use" means any of the following:
 - (1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10- year period ending no earlier than December 31, 2004, and no later than December 31, 2010.
 - (2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.
 - (3) For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.
- (c) "Baseline commercial, industrial, and institutional water use" means an urban retail water supplier's base daily per capita water use for commercial, industrial, and institutional users.
- (d) "Commercial water user" means a water user that provides or distributes a product or service.
- (e) "Compliance daily per capita water use" means the gross water use during the final year of the reporting period, reported in gallons per capita per day.
- (f) "Disadvantaged community" means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.
- (g) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:
 - (1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.
 - (2) The net volume of water that the urban retail water supplier places into long- term storage.

- (3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.
- (4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.
- (h) "Industrial water user" means a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.
- (i) "Institutional water user" means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.
- (j) "Interim urban water use target" means the midpoint between the urban retail water supplier's base daily per capita water use and the urban retail water supplier's urban water use target for 2020.
- (k) "Locally cost effective" means that the present value of the local benefits of implementing an agricultural efficiency water management practice is greater than or equal to the present value of the local cost of implementing that measure.
- (l) "Process water" means water used for producing a product or product content or water used for research and development, including, but not limited to, continuous manufacturing processes, water used for testing and maintaining equipment used in producing a product or product content, and water used in combined heat and power facilities used in producing a product or product content. Process water does not mean incidental water uses not related to the production of a product or product content, including, but not limited to, water used for restrooms, landscaping, air conditioning, heating, kitchens, and laundry.
- (m) "Recycled water" means recycled water, as defined in subdivision (n) of Section 13050, that is used to offset potable demand, including recycled water supplied for direct use and indirect potable reuse, that meets the following requirements, where applicable:
 - (1) For groundwater recharge, including recharge through spreading basins, water supplies that are all of the following:
 - (A) Metered.
 - (B) Developed through planned investment by the urban water supplier or a wastewater treatment agency.
 - (C) Treated to a minimum tertiary level.

- (D) Delivered within the service area of an urban retail water supplier or its urban wholesale water supplier that helps an urban retail water supplier meet its urban water use target.
- (2) For reservoir augmentation, water supplies that meet the criteria of paragraph (1) and are conveyed through a distribution system constructed specifically for recycled water.
- (j) "Regional water resources management" means sources of supply resulting from watershed-based planning for sustainable local water reliability or any of the following alternative sources of water:
 - (1) The capture and reuse of stormwater or rainwater.
 - (2) The use of recycled water.
 - (3) The desalination of brackish groundwater.
 - (4) The conjunctive use of surface water and groundwater in a manner that is consistent with the safe yield of the groundwater basin.
- (k) "Reporting period" means the years for which an urban retail water supplier reports compliance with the urban water use targets.
- (l) "Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.
- (m) "Urban water use target" means the urban retail water supplier's targeted future daily per capita water use.
- (n) "Urban wholesale water supplier," means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.

Chapter 3 Urban Retail Water Suppliers

SECTION 10608.16-10608.44

- 10608.16.(a) The state shall achieve a 20-percent reduction in urban per capita water use in California on or before December 31, 2020.
- (b) The state shall make incremental progress towards the state target specified in subdivision (a) by reducing urban per capita water use by at least 10 percent on or before December 31, 2015.

10608.20.(a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

(2) It is the intent of the Legislature that the urban water use targets described in paragraph (1) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020.

(b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:

(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2016 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.

(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31,

2020. In developing urban daily per capita water use targets, the department shall do all of the following:

- (A) Consider climatic differences within the state.
 - (B) Consider population density differences within the state.
 - (C) Provide flexibility to communities and regions in meeting the targets.
 - (D) Consider different levels of per capita water use according to plant water needs in different regions.
 - (E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.
 - (F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.
- (c) If the department adopts a regulation pursuant to paragraph (4) of subdivision (b) that results in a requirement that an urban retail water supplier achieve a reduction in daily per capita water use that is greater than 20 percent by December 31, 2020, an urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may limit its urban water use target to a reduction of not more than 20 percent by December 31, 2020, by adopting the method described in paragraph (1) of subdivision (b).
- (d) The department shall update the method described in paragraph (4) of subdivision (b) and report to the Legislature by December 31, 2014. An urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may adopt a new urban daily per capita water use target pursuant to this updated method.
- (e) An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.
- (f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.
- (g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).
- (h) (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical

methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:

(A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.

(B) Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.

(2) The department shall post the methodologies and criteria developed pursuant to this subdivision on its Internet Web site, and make written copies available, by October 1, 2010. An urban retail water supplier shall use the methods developed by the department in compliance with this part.

(i) (1) The department shall adopt regulations for implementation of the provisions relating to process water in accordance with subdivision (l) of Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

(j) (1) An urban retail water supplier is granted an extension to July 1, 2011, for adoption of an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) due in 2010 to allow the use of technical methodologies developed by the department pursuant to paragraph (4) of subdivision (b) and subdivision (h). An urban retail water supplier that adopts an urban water management plan due in 2010 that does not use the methodologies developed by the department pursuant to subdivision (h) shall amend the plan by July 1, 2011, to comply with this part.

(2) An urban wholesale water supplier whose urban water management plan prepared pursuant to Part 2.6 (commencing with Section 10610) was due and not submitted in 2010 is granted an extension to July 1, 2011, to permit coordination between an urban wholesale water supplier and urban retail water suppliers.

10608.22. Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as

defined in paragraph(3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

- 10608.24.(a) Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.
- (b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.
- (c) An urban retail water supplier's compliance daily per capita water use shall be the measure of progress toward achievement of its urban water use target.
- (d) (1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:
- (A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.
 - (B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.
 - (C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.
- (2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.
- (e) When developing the urban water use target pursuant to Section 10608.20, an urban retail water supplier that has a substantial percentage of industrial water use in its service area may exclude process water from the calculation of gross water use to avoid a disproportionate burden on another customer sector.
- (f) (1) An urban retail water supplier that includes agricultural water use in an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) may include the agricultural water use in determining gross water use. An urban retail water supplier that includes agricultural water use in determining gross water use and develops its urban water use target pursuant to paragraph (2) of subdivision (b) of Section 10608.20 shall use a water efficient standard for agricultural irrigation of 100 percent of reference evapotranspiration multiplied by the crop coefficient for irrigated acres.
- (2) An urban retail water supplier, that is also an agricultural water supplier, is not subject to the requirements of Chapter 4 (commencing with Section

10608.48), if the agricultural water use is incorporated into its urban water use target pursuant to paragraph (1).

10608.26.(a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

- (1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.
- (2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.
- (3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

(b) In complying with this part, an urban retail water supplier may meet its urban water use target through efficiency improvements in any combination among its customer sectors. An urban retail water supplier shall avoid placing a disproportionate burden on any customer sector.

(c) For an urban retail water supplier that supplies water to a United States Department of Defense military installation, the urban retail water supplier's implementation plan for complying with this part shall consider the conservation of that military installation under federal Executive Order 13514.

(d) (1) Any ordinance or resolution adopted by an urban retail water supplier after the effective date of this section shall not require existing customers as of the effective date of this section, to undertake changes in product formulation, operations, or equipment that would reduce process water use, but may provide technical assistance and financial incentives to those customers to implement efficiency measures for process water. This section shall not limit an ordinance or resolution adopted pursuant to a declaration of drought emergency by an urban retail water supplier.

(2) This part shall not be construed or enforced so as to interfere with the requirements of Chapter 4 (commencing with Section 113980) to Chapter 13 (commencing with Section 114380), inclusive, of Part 7 of Division 104 of the Health and Safety Code, or any requirement or standard for the protection of public health, public safety, or worker safety established by federal, state, or local government or recommended by recognized standard setting organizations or trade associations.

10608.28.(a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

- (1) Through an urban wholesale water supplier.
- (2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31

(commencing with Section 81300)).

(3) Through a regional water management group as defined in Section 10537.

(4) By an integrated regional water management funding area.

(5) By hydrologic region.

(6) Through other appropriate geographic scales for which computation methods have been developed by the department.

(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

10608.32. All costs incurred pursuant to this part by a water utility regulated by the Public Utilities Commission may be recoverable in rates subject to review and approval by the Public Utilities Commission, and may be recorded in a memorandum account and reviewed for reasonableness by the Public Utilities Commission.

10608.36. Urban wholesale water suppliers shall include in the urban water management plans required pursuant to Part 2.6 (commencing with Section 10610) an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.

10608.40. Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

10608.42.(a) The department shall review the 2015 urban water management plans and report to the Legislature by July 1, 2017, on progress towards achieving a 20-percent reduction in urban water use by December 31, 2020. The report shall include recommendations on changes to water efficiency standards or urban water use targets to achieve the 20-percent reduction and to reflect updated efficiency information and technology changes.

(b) A report to be submitted pursuant to subdivision (a) shall be submitted in compliance with Section 9795 of the Government Code.

10608.43 The department, in conjunction with the California Urban Water Conservation Council, by April 1, 2010, shall convene a representative task force consisting of academic experts, urban retail water suppliers, environmental organizations, commercial water users, industrial water users, and institutional water users to develop alternative best management practices for commercial, industrial, and

institutional users and an assessment of the potential statewide water use efficiency improvement in the commercial, industrial, and institutional sectors that would result from implementation of these best management practices. The taskforce, in conjunction with the department, shall submit a report to the Legislature by April 1, 2012, that shall include a review of multiple sectors within commercial, industrial, and institutional users and that shall recommend water use efficiency standards for commercial, industrial, and institutional users among various sectors of water use. The report shall include, but not be limited to, the following:

- (a) Appropriate metrics for evaluating commercial, industrial, and institutional water use.
- (b) Evaluation of water demands for manufacturing processes, goods, and cooling.
- (c) Evaluation of public infrastructure necessary for delivery of recycled water to the commercial, industrial, and institutional sectors.
- (d) Evaluation of institutional and economic barriers to increased recycled water use within the commercial, industrial, and institutional sectors.
- (e) Identification of technical feasibility and cost of the best management practices to achieve more efficient water use statewide in the commercial, industrial, and institutional sectors that is consistent with the public interest and reflects past investments in water use efficiency.

10608.44. Each state agency shall reduce water use at facilities it operates to support urban retail water suppliers in meeting the target identified in Section 10608.16.

Chapter 4 Agricultural Water Suppliers

SECTION 10608.48

10608.48.(a) On or before July 31, 2012, an agricultural water supplier shall implement efficient water management practices pursuant to subdivisions (b) and (c).

- (b) Agricultural water suppliers shall implement all of the following critical efficient management practices:
 - (1) Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).
 - (2) Adopt a pricing structure for water customers based at least in part on quantity delivered.

(c) Agricultural water suppliers shall implement additional efficient management

practices, including, but not limited to, practices to accomplish all of the following, if the measures are locally cost effective and technically feasible:

- (1) Facilitate alternative land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage.
- (2) Facilitate use of available recycled water that otherwise would not be used beneficially, meets all health and safety criteria, and does not harm crops or soils.
- (3) Facilitate the financing of capital improvements for on-farm irrigation systems.
- (4) Implement an incentive pricing structure that promotes one or more of the following goals:
 - (A) More efficient water use at the farm level.
 - (B) Conjunctive use of groundwater.
 - (C) Appropriate increase of groundwater recharge.
 - (D) Reduction in problem drainage.
 - (E) Improved management of environmental resources.
 - (F) Effective management of all water sources throughout the year by adjusting seasonal pricing structures based on current conditions.
- (5) Expand line or pipe distribution systems, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage.
- (6) Increase flexibility in water ordering by, and delivery to, water customers within operational limits.
- (7) Construct and operate supplier spill and tailwater recovery systems.
- (8) Increase planned conjunctive use of surface water and groundwater within the supplier service area.
- (9) Automate canal control structures.
- (10) Facilitate or promote customer pump testing and evaluation.
- (11) Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.
- (12) Provide for the availability of water management services to water users.

These services may include, but are not limited to, all of the following:

- (A) On-farm irrigation and drainage system evaluations.
 - (B) Normal year and real-time irrigation scheduling and crop evapotranspiration information.
 - (C) Surface water, groundwater, and drainage water quantity and quality data.
 - (D) Agricultural water management educational programs and materials for farmers, staff, and the public.
- (13) Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow more flexible water deliveries and storage.
- (14) Evaluate and improve the efficiencies of the supplier's pumps.
- (d) Agricultural water suppliers shall include in the agricultural water management plans required pursuant to Part 2.8 (commencing with Section 10800) a report on which efficient water management practices have been implemented and are planned to be implemented, an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future. If an agricultural water supplier determines that an efficient water management practice is not locally cost effective or technically feasible, the supplier shall submit information documenting that determination.
- (e) The data shall be reported using a standardized form developed pursuant to Section 10608.52.
- (f) An agricultural water supplier may meet the requirements of subdivisions (d) and (e) by submitting to the department a water conservation plan submitted to the United States Bureau of Reclamation that meets the requirements described in Section 10828.
- (g) On or before December 31, 2013, December 31, 2016, and December 31, 2021, the department, in consultation with the board, shall submit to the Legislature a report on the agricultural efficient water management practices that have been implemented and are planned to be implemented and an assessment of the manner in which the implementation of those efficient water management practices has affected and will affect agricultural operations, including estimated water use efficiency improvements, if any.
- (h) The department may update the efficient water management practices required pursuant to subdivision (c), in consultation with the Agricultural Water Management Council, the United States Bureau of Reclamation, and the board. All efficient water management practices for agricultural water use pursuant to this chapter shall be adopted or revised by the department only after the

department conducts public hearings to allow participation of the diverse geographical areas and interests of the state.

- (i) (1) The department shall adopt regulations that provide for a range of options that agricultural water suppliers may use or implement to comply with the measurement requirement in paragraph (1) of subdivision (b).
- (2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

Chapter 5 Sustainable Water Management

Section 10608.50

10608.50.(a) The department, in consultation with the board, shall promote implementation of regional water resources management practices through increased incentives and removal of barriers consistent with state and federal law. Potential changes may include, but are not limited to, all of the following:

- (1) Revisions to the requirements for urban and agricultural water management plans.
 - (2) Revisions to the requirements for integrated regional water management plans.
 - (3) Revisions to the eligibility for state water management grants and loans.
 - (4) Revisions to state or local permitting requirements that increase water supply opportunities, but do not weaken water quality protection under state and federal law.
 - (5) Increased funding for research, feasibility studies, and project construction.
 - (6) Expanding technical and educational support for local land use and water management agencies.
- (b) No later than January 1, 2011, and updated as part of the California Water Plan, the department, in consultation with the board, and with public input, shall propose new statewide targets, or review and update existing statewide targets, for regional water resources management practices, including, but not limited to, recycled water, brackish groundwater desalination, and infiltration and direct use of urban stormwater runoff.

Chapter 6 Standardized Data Collection

SECTION 10608.52

- 10608.52.(a) The department, in consultation with the board, the California Bay-Delta Authority or its successor agency, the State Department of Public Health, and the Public Utilities Commission, shall develop a single standardized water use reporting form to meet the water use information needs of each agency, including the needs of urban water suppliers that elect to determine and report progress toward achieving targets on a regional basis as provided in subdivision (a) of Section 10608.28.
- (b) At a minimum, the form shall be developed to accommodate information sufficient to assess an urban water supplier's compliance with conservation targets pursuant to Section 10608.24 and an agricultural water supplier's compliance with implementation of efficient water management practices pursuant to subdivision (a) of Section 10608.48. The form shall accommodate reporting by urban water suppliers on an individual or regional basis as provided in subdivision (a) of Section 10608.28.

Chapter 7 Funding Provisions

Section 10608.56-10608.60

- 10608.56.(a) On and after July 1, 2016, an urban retail water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.
- (b) On and after July 1, 2013, an agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.
- (c) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for achieving the per capita reductions. The supplier may request grant or loan funds to achieve the per capita reductions to the extent the request is consistent with the eligibility requirements applicable to the water funds.
- (d) Notwithstanding subdivision (b), the department shall determine that an agricultural water supplier is eligible for a water grant or loan even though the supplier is not implementing all of the efficient water management practices described in Section 10608.48, if the agricultural water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the efficient

water management practices. The supplier may request grant or loan funds to implement the efficient water management practices to the extent the request is consistent with the eligibility requirements applicable to the water funds.

- (e) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval documentation demonstrating that its entire service area qualifies as a disadvantaged community.
- (f) The department shall not deny eligibility to an urban retail water supplier or agricultural water supplier in compliance with the requirements of this part and Part 2.8 (commencing with Section 10800), that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the requirements of this part or Part 2.8 (commencing with Section 10800).

10608.60.(a) It is the intent of the Legislature that funds made available by Section 75026 of the Public Resources Code should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for grants to implement this part. In the allocation of funding, it is the intent of the Legislature that the department give consideration to disadvantaged communities to assist in implementing the requirements of this part.

- (b) It is the intent of the Legislature that funds made available by Section 75041 of the Public Resources Code, should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for direct expenditures to implement this part.

Chapter 8 Quantifying Agricultural Water Use Efficiency

SECTION 10608.64

The department, in consultation with the Agricultural Water Management Council, academic experts, and other stakeholders, shall develop a methodology for quantifying the efficiency of agricultural water use. Alternatives to be assessed shall include, but not be limited to, determination of efficiency levels based on crop type or irrigation system distribution uniformity. On or before December 31, 2011, the department shall report to the Legislature on a proposed methodology and a plan for implementation. The plan shall include the estimated implementation costs and the types of data needed to support the methodology. Nothing in this section authorizes the department to implement a methodology established pursuant to this section.

Appendix D

Notification of Intent to Prepare the Urban Water Management Plan

February 24, 2021

Chief Executive Office
County of Los Angeles
358 Kenneth Hahn Hall of Administration
500 W. Temple St., Los Angeles, CA 90012

RE: Notification to Prepare City of Vernon 2020 Urban Water Management Plan

ATTN: Los Angeles County Administrator

Dear sirs:

Michael Baker International is preparing the City of Vernon 2020 Urban Water Management Plan (UWMP).

Pursuant to California Water Code Section 10621(b), I am notifying Los Angeles County as their representative that the City will be reviewing its UWMP and considering amendments or changes to it.

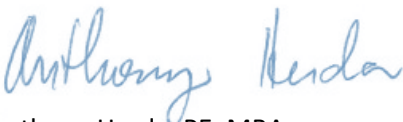
Water Code Section 10621(b)

Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

Please contact me with any questions regarding this notification at Anthony.Herda@mbakerintl.com or (626) 660-4837.

Warm regards,

Michael Baker International, Inc.



Anthony Herda, PE, MBA
UWMP Preparer

Appendix E

2019 Consumer Confidence Report

City of Vernon

2019 Annual Water Quality Report *Informe Anual de Calidad del Agua 2019*



City of Vernon
4305 Santa Fe Ave.
Vernon, Ca 90058

CITY OF VERNON 2019 ANNUAL WATER QUALITY REPORT

Since 1991, California water utilities have been providing information on water served to its consumers. This report is a snapshot of the drinking water quality that we provided last year. Included are details about where your water comes from, how it is tested, what is in it, and how it compares with state and federal limits. We strive to keep you informed about the quality of your water and to provide a reliable and economical supply that meets all regulatory requirements.

Where Does My Tap Water Come From?



Your drinking water comes from two sources: groundwater and surface water. The City of Vernon (City) pumps groundwater from local, deep wells in the Central Groundwater Basin. We also use Metropolitan Water District of Southern California's (MWD) treated surface water, which is a blend of Colorado River water and water from northern California delivered through the State Water Project. These water sources supply our service area shown on the adjacent map. The quality of our groundwater and MWD's surface water supplies is presented in this report.

How is My Drinking Water Tested?

Your drinking water is tested by certified professional water system operators and certified laboratories to ensure its safety. The City drinking water from wells and distribution system pipes are routinely tested for bacterial, radiological and chemical constituents. The chart in this report shows the average and range of concentrations of the constituents tested in your drinking water during year 2019 or from the most recent tests. The State Water Resources Control Board, Division of Drinking Water (DDW)

allows some constituents to be tested less than once per year because the concentrations of these constituents do not change frequently. Some of our data, although representative, is more than one year old. The chart lists all the constituents **detected** in your drinking water that have federal and state drinking water standards. Detected unregulated constituents of interest are also included. We are proud to report that during 2019, the drinking water provided by the City to your home or business met or surpassed all federal and state drinking water standards. We remain dedicated to providing you with a reliable supply of high quality drinking water.

What Are Water Quality Standards?

The chart in this report shows the following types of water quality standards:

- **Maximum Contaminant Level (MCL):** The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the Public Health Goals (PHGs) or Maximum Contaminant Level Goals (MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.
- **Maximum Residual Disinfectant Level (MRDL):** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial pathogens.
- **Primary Drinking Water Standard:** MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements and water treatment requirements.
- **Regulatory Action Level (AL):** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

What is a Water Quality Goal?

In addition to mandatory water quality standards, the U.S. Environmental Protection Agency (USEPA) and DDW have set voluntary water quality goals for some contaminants. Water quality goals are often set at such low levels that they are not achievable in practice and are not directly measurable. Nevertheless, these goals provide useful guideposts and direction for water management practices. The chart in this report includes three types of water quality goals:

- **Maximum Contaminant Level Goal (MCLG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.
- **Maximum Residual Disinfectant Level Goal (MRDLG):** The level of a disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
- **Public Health Goal (PHG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

How Do I Read the Water Quality Table?

Although we test for over 100 substances, regulations require us to report only those detected in your water. The first column of the water quality table lists substances detected in your water. The next columns list the average concentration and range of concentrations found in your drinking water. Following are columns that list the MCL and PHG or MCLG, if appropriate. The last column describes the likely sources of these substances found in drinking water.

To review the quality of your drinking water, compare the highest concentration and the MCL. Check for substances greater than the MCL. Exceedance of a primary MCL does not usually constitute an immediate health threat, rather, it requires testing the source water more frequently for a short duration. If test results show that the water continues to exceed the MCL, the water must be treated to remove the substance, or the source must be removed from service. The City does not need any additional water treatment to comply with primary drinking water standards. The City distributes water that has been disinfected with chlorine to prevent bacterial growth in distribution pipes.

Secondary MCLs are standards intended for cosmetic or aesthetic considerations. Exceedance of a secondary MCL does not pose a health threat. The secondary MCL for manganese was exceeded in three wells in 2019. While the secondary MCL for iron was not exceeded in 2019, it had been exceeded in previous years. A survey of the City's 863 billed water customers in 2007 resulted in a 76 percent participation rate and 542 votes (63 percent) for "no treatment" of the City's water to remove iron and manganese. Given these findings, DDW waived the City from compliance with the secondary MCLs for iron and manganese for a period of nine years, ending August 29, 2016. Throughout the waiver period, iron and manganese levels in active groundwater sources were equivalent to or better than they had been preceding the waiver period. Furthermore, the secondary MCL for iron was not exceeded on a running annual average basis at any active source during the waiver period. Given these findings, DDW has renewed the waiver for a period of nine years, ending August 29, 2025. The iron and manganese MCLs are set to protect against unpleasant effects such as color, taste, odor, and staining of laundry/plumbing fixtures. Groundwater is blended with surface water before delivery to the customer, which dilutes the amount of manganese actually reaching the tap. An iron or manganese secondary MCL exceedance does not pose a health risk.

Why Do I See So Much Coverage in the News About the Quality Of Tap Water?

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- Microbial contaminants, including viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife;
- Inorganic contaminants, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming;
- Pesticides and herbicides, that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses;
- Organic chemical contaminants, including synthetic and volatile organic chemicals, that are byproducts of industrial processes and petroleum production, and can also come from gasoline stations, urban stormwater runoff, agricultural application, and septic systems;
- Radioactive contaminants, that can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the USEPA and the DDW prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The U.S. Food and Drug Administration regulations and California law also establish limits for contaminants in bottled water that must provide the same protection for public health.

All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791). You can also get more information on tap water by logging on to these helpful web sites:

- <https://www.epa.gov/ground-water-and-drinking-water> (USEPA's drinking water web site)
- http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/publicwatersystems.shtml (DDW web site).

Should I Take Additional Precautions?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised people, such as people with cancer who are undergoing chemotherapy, people who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people

should seek advice about drinking water from their health care providers. The USEPA/Centers for Disease Control guidelines on appropriate means to lessen the risk of infection of *Cryptosporidium* and other microbial contaminants are available from the USEPA's Safe Drinking Water Hotline (1-800-426-4791).

Lead in Tap Water

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at: <https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water>.

Source Water Assessment

Every five years, MWD is required by DDW to examine possible sources of drinking water contamination in its State Water Project and Colorado River source waters. The most recent watershed sanitary surveys of MWD's source water supplies from the Colorado River was updated in 2015 and the State Water Project was updated in 2016. Water from the Colorado River is considered to be most vulnerable to contamination from recreation, urban/stormwater runoff, increasing urbanization in the watershed, and wastewater. Water supplies from Northern California's State Water Project are most vulnerable to contamination from urban/stormwater runoff, wildlife, agriculture, recreation, and wastewater. USEPA also requires MWD to complete one Source Water Assessment (SWA) that utilizes information collected in the watershed sanitary surveys. MWD completed its SWA in December 2002. The SWA is used to evaluate the vulnerability of water sources to contamination and helps determine whether more protective measures are needed. A copy of the most recent summary of either the Watershed Sanitary Survey or the SWA can be obtained by calling MWD at (800) CALL-MWD.

The City conducted an assessment of its groundwater supplies in 2002. Groundwater supplies are considered most vulnerable to metal plating/finishing/fabricating, automobile repair shops, automobile gasoline stations, cement/concrete plants, chemical/petroleum processing/storage, irrigated crops, fleet/truck/bus terminals, food processing, furniture repair/manufacturing, hardware/lumber/parts stores, lumber processing and manufacturing, motor pools, office buildings/complexes, photograph processing/printing, plastics/synthetics producers, schools, sewer collection systems, water supply wells, wood/pulp/paper processing and mills, landfills/dumps, railroad yards/maintenance/fueling areas, utility stations-maintenance areas, and electrical/electronic manufacturing. You may request a copy of the assessment from Mrs. Joanna Moreno at (323) 583-8811 ext. 888.

How Can I Participate in Decisions On Water Issues That Affect Me?

The public is welcome to attend City Council meetings the first and third Tuesday of the month at 9 a.m. at City Hall in the Council Chambers, 4305 Santa Fe Avenue.

How Do I Contact My Water Agency If I Have Any Questions About Water Quality?

If you have specific questions about your tap water quality, please contact Mrs. Joanna Moreno at (323) 583-8811 ext. 888.

Visit us on the web at: www.cityofvernon.org

CIUDAD DE VERNON

INFORME ANUAL DE LA CALIDAD DEL AGUA DEL AÑO 2019

Desde 1991, las agencias proveedoras de servicio de agua de California han emitido información sobre el agua que se provee al consumidor. Este informe es una copia del informe sobre la calidad del agua potable que le proveímos el año pasado. Incluimos detalles sobre el origen del agua que toma, cómo se analiza, que contiene, y cómo se compara con los límites estatales y federales. Nos esforzamos por mantenerle informado sobre la calidad de su agua, y proveerle un abastecimiento confiable y económico que cumpla con todos los requisitos.

¿De Dónde Proviene el Agua que Tomo?



Su agua de la llave proviene de 2 fuentes: aguas subterráneas y aguas de superficie. La Ciudad de Vernon bombea el agua subterránea de pozos locales, en el fondo de las aguas subterráneas en la cuenca Central. También utilizamos agua de superficie del Metropolitan Water District of Southern California (MWD) el cual es una mezcla de agua del Río Colorado y del norte de California entregada vía el Proyecto Hidráulico del Estado. Estas dos fuentes de agua nos abastecen en las áreas de servicio que se muestran en el mapa adjunto. Este reporte informa sobre la calidad de nuestra agua subterránea y el abastecimiento de agua de superficie del MWD.

¿Cómo Se Analiza Mi Agua Potable?

Para garantizar su seguridad, su agua potable es analizada por operadores profesionales certificados en el sistema del agua y por laboratorios certificados. El agua potable de la Ciudad de Vernon de pozos y tuberías de distribución del sistema son rutinariamente sometidas a pruebas para revisar componentes de bacteria, radioactividad u otros químicos. La tabla en este informe muestra el promedio y la variedad de concentraciones de los componentes analizados en su agua potable durante el año 2019 o de las pruebas más recientes. El State Water Resources Control Board, Division of Drinking Water (DDW) nos permite analizar algunas sustancias menos frecuentemente que los periodos anuales porque los resultados no cambian con frecuencia. Algunos de nuestros datos, aunque son representativos, tienen más de un año. La tabla incluye todos los componentes **detectados** en su agua potable bajo las leyes estatales y federales. Componentes de interés no regularizados también han sido incluidos. Estamos orgullosos de relatarle que, durante el año 2019, el agua potable proveída por la Ciudad de Vernon a su casa o negocio cumplió o supero las normas estatales y federales. Permanecemos dedicados a proveerle agua potable de la más alta calidad.

¿Cuales Son las Normas de la Calidad del Agua Potable?

La tabla en este informe muestra los siguientes tipos de normas de calidad del agua:

- **Nivel Máximo de Contaminante (MCL, en inglés):** El nivel más alto de un contaminante que se permite en el agua potable. Los MCLs primarios se establecen lo más cerca posible, económicamente y tecnológicamente a las Metas de Salud Pública (PHGs, en inglés) o Meta de Nivel Máximo de Contaminante (MCLGs, en inglés). Los MCLs secundarios se establecen para proteger el olor, sabor y apariencia en el agua de beber.
- **Nivel Máximo de Desinfectante Residual (MRDL, en inglés):** El nivel más alto de un desinfectante que se permite en el agua potable. Hay evidencia convincente de que la adición de un desinfectante es necesario para mantener el control de los patógenos microbianos.
- **Norma Primaria del Agua Potable:** Los MCLs y MRDLs para contaminantes que afectan la salud junto con sus requisitos de monitoreo y presentación de informes y requisitos del tratamiento de agua.
- **Nivel de Acción Regulatorio (AL, en inglés):** La concentración de un contaminante que, si se excede, provoca el tratamiento u otros requisitos que un sistema de agua debe seguir.

¿Que son Objetivos de Calidad del Agua?

Además de las normas obligatorias de calidad del agua, la Agencia de Protección Ambiental de los Estados Unidos (USEPA) y DDW han establecido metas voluntarias para calidad del agua en algunos contaminantes. Los objetivos de la calidad del agua se han establecido en niveles tan bajos que no son realizables en práctica y no son directamente medibles. Sin embargo, estos objetivos proveen guías útiles y prácticas de dirección para el manejo del agua. La tabla en este informe incluye tres tipos de objetivos de calidad del agua:

- **Meta de Nivel Máximo de Contaminante (MCLG, en inglés):** El nivel de un contaminante en el agua potable bajo el cual no hay riesgo conocido o previsto hacia la salud. Los MCLGs son establecidos por la USEPA.
- **Meta de Nivel Máximo de Desinfectante Residual (MRDLG, en inglés):** El nivel de un desinfectante bajo el cual no hay riesgo conocido o previsto hacia la salud. Los MRDLGs no reflejan los beneficios del uso de desinfectantes para controlar los contaminantes microbianos.

- **Meta de Salud Pública (PHG, en inglés):** El nivel de un contaminante en el agua potable bajo el cual no hay riesgo conocido o previsto hacia la salud. Los PHGs son establecidos por la Agencia de Protección Ambiental de California.

¿Cómo Interpreto Mi Informe de Calidad del Agua?

Aunque analizamos más de 100 sustancias, las normas nos requieren que reportemos solo aquellas que se encuentran en el agua. La primera columna en la tabla de la calidad de agua muestra la lista de las sustancias detectadas en el agua. Las siguientes columnas muestran la lista de la concentración promedio y el rango de concentraciones que se hayan encontrado en el agua que usted toma. En seguida están las listas del MCL, el PHG y el MCLG, si estos son apropiados. La última columna describe las probables fuentes u origen de las sustancias detectadas en el agua potable.

Para revisar la calidad de su agua de beber, compare la concentración más alta y los niveles máximos de contaminantes. Si los resultados superan el nivel de contaminantes, no constituye necesariamente una amenaza para la salud de inmediato, más bien, se requiere analizar la fuente de agua con más frecuencia por un corto periodo. Si los resultados siguen siendo superiores a los niveles máximos permisibles de contaminantes, el agua debe ser tratada para cumplir con las normas primarias de agua potables o la fuente debe ser retirada del servicio público. La Ciudad no necesita ningún tratamiento de agua adicional para cumplir con las normas primarias de agua potable. La Ciudad distribuye agua que ha sido desinfectada con cloro para prevenir el crecimiento de bacterias en las tuberías de distribución.

Los MCL secundarios son normas destinadas a consideraciones cosméticas o estéticas. Superación de un MCL secundario no representa una amenaza para la salud. El MCL secundario de manganeso fue superado en tres pozos en el 2019. Mientras que el MCL secundario de hierro no fue excedido en el 2019, en años anteriores sí había sido excedido. Una encuesta de 863 consumidores de agua en la Ciudad en el 2007 resultó en participación de 76% y 542 votos (63%) para "ningún tratamiento" del agua de la ciudad para eliminar el hierro y el manganeso. Tomando en cuenta estos resultados, el DDW ha eximido a la Ciudad de Vernon del cumplimiento de los MCLs secundarios de hierro y manganeso por un período de nueve años, terminando el 29 de agosto del 2016. Durante todo este periodo de renuncia, los niveles de hierro y manganeso en las fuentes activas de agua subterránea fueron equivalentes o mejores que lo que habían sido antes del periodo de exención. Además, el MCL secundario de hierro no fue superado en base de promedio anual en ninguna fuente activa durante el periodo de exención. Dadas las conclusiones, DDW ha renovado la renuncia por un periodo de nueve años, terminando el 29 de agosto del 2025. Los MCLs secundarios de hierro y manganeso se establecen para proteger en contra de los efectos desagradables como el color, sabor, olor y manchas de la ropa y los accesorios de plomería. Las aguas subterráneas se mezclan con las aguas de superficie antes de entregar al cliente, lo cual diluye la cantidad de manganeso que realmente llega al grifo. Superación de los MCLs secundarios de hierro o manganeso no representa ningún riesgo para la salud.

¿Por Qué Hay Tanta Publicidad Sobre La Calidad Del Agua Potable?

Las fuentes del agua potable (de ambas, agua de la llave y agua embotellada) incluyen ríos, lagos, arroyos, lagunas, embalses, manantiales, y pozos. Al pasar el agua por las superficies de la tierra o subterráneas, se disuelven minerales que ocurren al natural, y en algunas ocasiones, material radioactivo, al igual que pueden levantar sustancias generadas por la presencia de animales o por actividades humanas.

Los contaminantes que pueden existir en las fuentes de agua incluyen:

- Contaminantes microbianos, como virus y bacterias, que pueden provenir de plantas de tratamiento de aguas residuales, sistemas sépticos, actividades agrícolas y ganaderas, y de la vida silvestre;
- Contaminantes inorgánicos, como las sales y los metales, los cuales pueden ocurrir naturalmente o como resultado del desagüe pluvial, industrial, o de alcantarillado, producción de gas natural y petróleo, minas y agricultura.
- Pesticidas y herbicidas, los cuales pueden provenir de varias fuentes tales como la agricultura, el desagüe pluvial, y usos residenciales;
- Contaminantes de otras sustancias químicas orgánicas, incluyendo químicos orgánicos volátiles y sintéticos que son productos de procesos industriales y de la producción de petróleo, y que pueden provenir de las estaciones de gasolina, desagües pluviales urbanos, de aplicaciones agrícolas y de sistemas sépticos;
- Contaminantes radioactivos, los cuales pueden ocurrir naturalmente o que pueden ser resultados de las actividades de la producción de gas natural y minería.

Con el fin de asegurar que el agua del grifo es segura para beber, USEPA y DDW imponen reglamentos que limitan la cantidad de ciertos contaminantes en el agua suministrada por sistemas públicos de agua. El U.S. Food and Drug Administration (FDA) y la ley de California también establecen límites de contaminantes en el agua embotellada que deben proveer la misma protección para la salud pública.

Toda el agua potable, incluyendo el agua embotellada, puede razonablemente contener cantidades pequeñas de ciertos contaminantes. La presencia de contaminantes no necesariamente indica que haya algún riesgo de salud. Para más información acerca de los contaminantes y riesgos a la salud favor de llamar a la USEPA Safe Drinking Water Hotline al teléfono (1-800-426-4791). También puede obtener más información sobre el agua potable al conectarse al Internet en las siguientes páginas:

- <https://www.epa.gov/ground-water-and-drinking-water> (pagina web de USEPA)

- http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/publicwatersystems.shtml (pagina web de DDW).

¿Debería Tomar Otras Precauciones?

Algunas personas pueden ser más vulnerables a los contaminantes en el agua potable que el público en general. Las personas que tienen problemas inmunológicos, tal como esas personas que estén en tratamiento por medio de quimioterapia cancerosa; personas que tienen órganos trasplantados, o personas con HIV/AIDS o desordenes inmunológicas, personas de edad avanzada, y los bebés pueden ser particularmente susceptibles a ciertas infecciones. Estas personas deben consultar a sus proveedores de salud médica. Las guías de la USEPA/Centers for Disease Control que aconsejan cómo disminuir los riesgos para prevenir la infección de Cryptosporidium y otros contaminantes microbianos son disponibles vía la USEPA Safe Drinking Water Hotline al teléfono (1-800-426-4791).

Acerca del Plomo en el Agua de la Llave

Si está presente, los niveles elevados de plomo pueden causar serios problemas de salud, especialmente para las mujeres embarazadas y niños pequeños. El plomo en el agua potable es principalmente de materiales y componentes relacionados con las líneas de servicio y de plomería en casa. La Ciudad de Vernon se encarga de proporcionar agua potable de alta calidad, pero no puede controlar la variedad de materiales utilizados en los componentes de la plomería. Cuando su agua potable no ha sido usada durante varias horas, usted puede reducir la exposición potencial al plomo dejando correr el agua de la llave durante 30 segundos a 2 minutos antes de usar el agua para beber o cocinar. Si usted está preocupado acerca del plomo en su agua, puede que se le analice su agua potable. Información sobre plomo en el agua potable, métodos de prueba o los pasos que pueden tomar para reducir al mínimo la exposición al plomo está disponible llamando a la línea directa de USEPA Safe Drinking Water Hotline o dirigiéndose a: <https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water>.

Fuente de Evaluación del Agua

Cada cinco años, MWD es requerido por DDW examinar posibles causas de contaminación del agua potable que proviene del Río Colorado y del Proyecto Hidráulico del Estado. Las más recientes encuestas sanitarias de cuencas hidrográficas para las aguas de fuente de MWD son la Encuesta Sanitaria de la Cuenca del Río Colorado – fue actualizado en el 2015, y las del Estado del Agua – fue actualizado en el 2016. Agua del Río Colorado es considerada más vulnerable a la contaminación de agua que corre de la ciudad después de una tormenta, a la recreación, a aguas residuales y a la contaminación que resulta de la urbanización creciente de la cuenca. El Proyecto de abastecimiento de agua del Estado es considerado más vulnerable al agua que corre de la ciudad después de una tormenta, a la fauna, la agricultura, la recreación, y aguas residuales. USEPA también requiere que MWD complete una evaluación de Fuentes de Agua (SWA en inglés) que utiliza información recolectada en las encuestas sanitarias de la cuenca. MWD completo su SWA en diciembre del 2002. El SWA se utiliza para evaluar la vulnerabilidad de las fuentes de agua a la contaminación y ayuda a determinar si se necesitan más medidas de protección. Para obtener una copia del resumen más reciente, ya sea de Encuesta Sanitaria de Cuencas Hidrográficas o de la SWA, favor de llamar al MWD al (800) CALL-MWD.

La Ciudad de Vernon codujo una valoración de su abastecimiento de aguas subterráneas en el 2002. El abastecimiento de aguas subterráneas es considerado más vulnerable al chapado, acabado, y fabricación de metal; talleres automotrices; estaciones de gasolina; plantas de cemento y concreto; a químicos, procesos petroleros, y almacenaje; al riego de cosechas; a flotas, camiones y terminales de autobuses; al procesamiento de alimentos; la reparación y fabricación de muebles; a tiendas de ferretería, maderas, y partes; a estacionamientos; a complejos y edificios de oficina; a la elaboración de fotografías e imprenta; plásticos y procedimientos sintéticos; escuelas; sistemas de colección de alcantarillados; a pozos de agua; a la elaboración y fabricación de madera, pasta, y papel; a depósitos bajo tierra y basureros; al mantenimiento de yardas ferroviarias y áreas de combustible; a estaciones de utilidad y mantenimiento; y a la manufactura de electricidad y productos electrónicos. Una copia de la valoración aprobada puede ser obtenida llamando a Joanna Moreno al (323) 583-8811 ext. 888.

¿Cómo Puedo Participar en las Decisiones Sobre Asuntos Acerca del Agua Que Me Puedan Afectar?

Se le invita al público a asistir a las juntas del Consejo el primer y tercer Martes del mes a las 9:00 a.m. en el City Hall en el Ayuntamiento de Consejo, 4305 Santa Fe Avenue.

¿Cómo Me Pongo En Contacto Con Mi Agencia del Agua Si Tengo Preguntas Sobre La Calidad Del Agua?

Si usted tiene preguntas específicas sobre la calidad del agua potable, por favor llame a Joanna Moreno al (323) 583-8811 ext.888.

CITY OF VERNON 2019 ANNUAL WATER QUALITY REPORT

Results are from the most recent testing performed in accordance with state and federal drinking water regulations

PRIMARY STANDARDS MONITORED AT THE SOURCE - MANDATED FOR PUBLIC HEALTH							
CONSTITUENTS AND UNITS	GROUNDWATER		MWD SURFACE WATER		MCL	(MCLG) or PHG	TYPICAL SOURCE IN DRINKING WATER
	AVERAGE	RANGE	AVERAGE	RANGE			
ORGANIC CHEMICALS Tested in 2019							
Toluene (µg/l)	ND	ND	0.6	0.6	150	150	Discharge from petroleum and chemical refineries
Trichloroethylene (µg/l)	<0.5	ND - 0.75	ND	ND	5	1.7	Industrial wastes and discharges
INORGANIC CHEMICALS Tested in 2016, 2018, and 2019							
Aluminum (mg/l)	<0.05	ND - 0.065	0.12	ND - 0.11	1	0.6	Runoff/leaching from natural deposits; treatment plant chemical
Bromate (µg/l)	NR		1.9	ND - 8.1	10	0.1	Byproduct of drinking water disinfection
Fluoride (mg/l) - naturally-occurring	0.36	0.32 - 0.42	NR		2	1	Runoff/leaching from natural deposits
Fluoride (mg/l) - treatment-related	NR		0.7	0.6 - 0.9	2	1	Water additive for dental health
Nitrate as N (mg/l)	0.4	ND - 2	0.5	0.5	10	10	Runoff and leaching from fertilizer use/septic tanks/sewage
RADIOLOGICALS Tested in 2011, and 2015 to 2019							
Gross Alpha (pCi/l)	<3	ND - 4.55	ND	ND	15	(0)	Erosion of natural deposits
Uranium (pCi/l)	1.7	ND - 8.1	ND	ND	20	0.43	Erosion of natural deposits

PRIMARY STANDARDS MONITORED IN THE DISTRIBUTION SYSTEM - MANDATED FOR PUBLIC HEALTH						
MICROBIALS Tested Weekly		HIGHEST % POSITIVE MONTHLY SAMPLES		MCL	MCLG	TYPICAL SOURCE IN DRINKING WATER
Total Coliform Bacteria		0.0%		5.0%	0	Naturally present in the environment
DISINFECTION BYPRODUCTS Tested Quarterly		AVERAGE	RANGE	MCL	Health Goal	TYPICAL SOURCE IN DRINKING WATER
Trihalomethanes-TTHMS (µg/l) (a)		27	ND - 31	80	-	By-product of drinking water disinfection
Haloacetic Acids (µg/l) (a)		4.1	ND - 5.1	60	-	By-product of drinking water disinfection
DISINFECTANT RESIDUAL Tested Weekly		AVERAGE	RANGE	MCL	Health Goal	TYPICAL SOURCE IN DRINKING WATER
Total Chlorine Residual (mg/l) (a)		0.58	0.02 - 2.2	4.0 (b)	4.0 (c)	Drinking water disinfectant added for treatment
LEAD AND COPPER AT-THE-TAP Tested in 2017		90th PERCENTILE LEVEL	# OF SITES ABOVE THE AL	MCL	PHG	TYPICAL SOURCE IN DRINKING WATER
Copper (mg/l)		0.18 (d)	0	1.3 AL	0.3	Internal corrosion of household plumbing
Lead (µg/l)		ND (d)	0	15 AL	0.2	Internal corrosion of household plumbing

SECONDARY STANDARDS MONITORED AT THE SOURCE - FOR AESTHETIC PURPOSES						
MINERALS AND METALS Tested in 2016 to 2019	GROUNDWATER		MWD SURFACE WATER		MCL	PHG
	AVERAGE	RANGE	AVERAGE	RANGE		
Aluminum (µg/l) (e)	<50	ND - 65	120	ND - 110	200	600
Chloride (mg/l)	51	29 - 87	50	46 - 55	500	-
Color (color units)	1.4	ND - 5	ND	ND - 1	15	-
Conductivity (µmhos/cm)	710	570 - 990	470	440 - 500	1,600	-
Iron (µg/l)	140	ND - 520	240	240	300	-
Manganese (µg/l) (f)	130	27 - 130	ND	ND	50	-
Odor (threshold odor number)	1	1	1	1	3	-
Sulfate (mg/l)	97	73 - 170	73	65 - 81	500	-
Total Dissolved Solids (mg/l)	430	350 - 590	270	240 - 290	1,000	-
Turbidity (NTU)	0.18	ND - 0.66	ND	ND	5	-

SECONDARY STANDARDS MONITORED IN THE DISTRIBUTION SYSTEM - FOR AESTHETIC PURPOSES					
GENERAL PHYSICALS					
Tested in 2019	AVERAGE	RANGE	MCL	Health Goal	TYPICAL SOURCE IN DRINKING WATER
Color (color units)	2.6	ND - 20	15	-	Naturally-occurring organic materials
Odor (threshold odor number)	1.1	1 - 2	3	-	Naturally-occurring organic materials
Turbidity (NTU)	0.2	ND - 0.7	5	-	Naturally-occurring organic materials

CHEMICALS OF ADDITIONAL INTEREST					
UNREGULATED CHEMICALS Tested in 2015, 2016, 2018, and 2019	GROUNDWATER		MWD SURFACE WATER		PHG (MCLG)
	AVERAGE	RANGE	AVERAGE	RANGE	
1,4-Dioxane (µg/l)	0.46	ND - 3.1	ND	ND	
Alkalinity (mg/l as CaCO3)	200	180 - 240	68	67 - 70	-
Calcium (mg/l)	71	53 - 109	25	23 - 27	-
Chlorate (µg/l)	80	25 - 310	32	32	
Chromium, Hexavalent (µg/l)	0.12	ND - 0.65	0.36	0.36	0.02
Chromium, Total (µg/l) (g)	0.28	ND - 0.89	ND	ND	(100)
Magnesium (mg/l)	17	12 - 27	12	11 - 12	-
Manganese (µg/l) (h)	62	22 - 120	2	2	SMCL=50
Molybdenum, Total (µg/l)	9.3	7.1 - 11	4.7	4.7	-
Perfluorohexanoic Acid (ng/l)	NR		2.6	2.5 - 2.6	-
pH (standard unit)	7.8	7.2 - 8	8.5	8.5	-
Potassium (mg/l)	4.2	3.4 - 5.2	2.4	2.2 - 2.7	-
Sodium (mg/l)	50	41 - 60	50	46 - 54	-
Strontium, Total (µg/l)	530	410 - 810	1,100	1,100	-
Total Hardness (mg/l as CaCO3)	247	182 - 384	110	100 - 120	-
Total Organic Carbon (mg/l)	NR		2.4	1.7 - 2.6	-
UNREGULATED CHEMICALS Tested in 2015 and 2019	DISTRIBUTION SYSTEM				PHG (MCLG)
	AVERAGE	RANGE			
Chlorate (µg/l)	65		65		-
Chromium, Hexavalent (µg/l)	0.41		0.41		0.02
Chromium, Total (µg/l) (g)	0.61		0.61		(100)
Haloacetic acids (HAA5) (µg/l)	0.81		ND - 3.02		-
Haloacetic acids (HAA6Br) (µg/l)	0.96		ND - 6.11		-
Haloacetic acids (HAA9) (µg/l)	1.28		ND - 6.33		-
Molybdenum, Total (µg/l)	6.8		6.8		-
Strontium, Total (µg/l)	910		910		-
Vanadium, Total (µg/l)	2		2		-
METROPOLITAN WATER DISTRICT FILTRATION TREATMENT					
MWD Combined Filter Effluent Weymouth Plant (Tested in 2019)	Treatment Technique	Turbidity Measurements	TT Violation?	Typical Source	
1) Highest single measurement	0.3 NTU	0.04	No	Soil Runoff	
2) Percentage of samples < 0.3 NTU	95%	100%	No		

FOOTNOTES/ACRONYMS

(a) Running annual average used to calculate MCL compliance.

(b) Maximum Residual Disinfectant Level (MRDL)

(c) Maximum Residual Disinfectant Level Goal (MRDLG)

(d) 90th percentile from the most recent sampling at selected customer taps. Thirty (30) sites are tested every 3 years. In 2019, no school submitted a request to be sampled for lead.

(e) Aluminum has primary and secondary standards.

(f) The secondary MCL for manganese was exceeded in 2019. Groundwater is blended with surface water before delivery to the customer, which dilutes the amount against unpleasant effects such as color, taste, odor, and staining of laundry/plumbing fixtures. A manganese secondary MCL exceedance does not pose a health risk.

(g) Total Chromium is regulated with an MCL of 50 µg/l but was not detected based on the detection limit for purposes of reporting of 10 µg/l. Total chromium was included as part of the unregulated chemicals requiring monitoring.

(h) Manganese was included as part of the unregulated chemicals requiring monitoring.

AL = Action Level; MCL = Maximum Contaminant Level;
MCLG = MCL Goal; SMCL = Secondary MCL
MWD = Metropolitan Water District of Southern California
MRDL = Maximum Residual Disinfectant Level; MRDLG = MRDL Goal
ND = constituent not detected at the reporting limit
NR = constituent not required to be tested; NTU = nephelometric turbidity units
PHG = Public Health Goal; TT = Treatment Technique
mg/l = milligrams per liter or parts per million (equivalent to 1 drop in 42 gallons)
µg/l = micrograms per liter or parts per billion (equivalent to 1 drop in 42,000 gallons)
ng/l = nanograms per liter or parts per trillion (equivalent to 1 drop in 42,000,000 gallons)
pCi/l = picoCuries per liter; µmhos/cm = micromhos per centimeter
"c" means the constituent was detected but the average of the test results is less than the reporting limit required by the State Water Resources Control Board, Division of Drinking Water.

Turbidity is a measure of the cloudiness of the water, an indication of particulate matter, some of which might include harmful microorganisms. Low turbidity in Metropolitan's treated water is a good indicator of effective filtration. Filtration is called a "treatment technique" (TT). A treatment technique is a required process intended to reduce the level of contaminants in drinking water that are difficult and sometimes impossible to measure directly.

Appendix F

SCAG Demographic Profile



Profile of the City of Vernon

Southern California Association of Governments (SCAG) Regional Council includes 69 districts which represent 191 cities and 6 counties in the SCAG region

SCAG Regional Council District 27 includes Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, and Vernon
Represented by: Hon. Ali Saleh

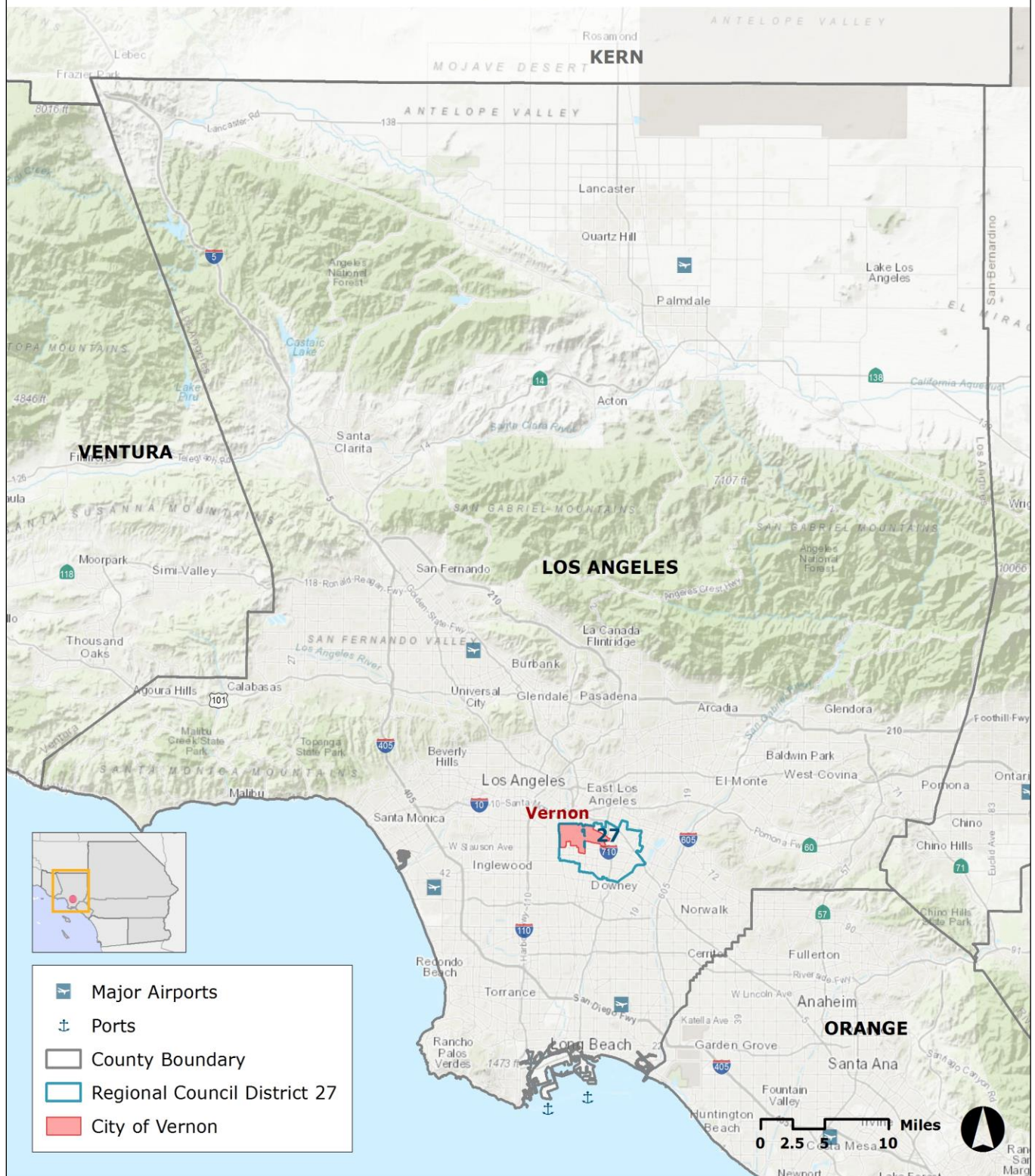


LOCAL PROFILES REPORT 2019

This profile report was prepared by the Southern California Association of Governments and shared with the City of Vernon. SCAG provides local governments with a variety of benefits and services including, for example, data and information, GIS training, planning and technical assistance, and sustainability planning grants.

May 2019
Southern California Association of Governments

SCAG REGIONAL COUNCIL DISTRICT 27



Source: 2016 SCAG city boundary data, provided by the county Local Agency Formation Commissions.

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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I. INTRODUCTION

The Southern California Association of Governments

The Southern California Association of Governments (SCAG) is the largest Metropolitan Planning Organization (MPO) in the nation, with nearly 19 million residents. The SCAG region includes six counties (Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura) and 191 incorporated cities. In addition, the SCAG region is a major hub of global economic activity, representing the 16th largest economy in the world and is considered the nation's gateway for international trade, with two of the largest ports in the nation. The SCAG region is also the most culturally diverse region in the nation, with no single ethnic group comprising a majority of the population. With a robust, diversified economy and a growing population substantially fueled by international immigration, the SCAG region is poised to continue its role as a primary metropolitan center on the Pacific Rim.

SCAG Activities

As the designated MPO, SCAG is mandated by federal law to research and develop a Regional Transportation Plan (RTP), which incorporates a Sustainable Communities Strategy (SCS) per California state law. Additionally, SCAG is pursuing a variety of innovative planning and policy initiatives to foster a more sustainable Southern California. In addition to conducting the formal planning activities required of an MPO, SCAG provides local governments with a wide variety of benefits and services including, for example, data and information, GIS training, planning and technical assistance, and support for sustainability planning grants.

The Local Profiles

In 2008, SCAG initiated the Local Profiles project as a part of a larger initiative to provide a variety of new services to its member cities and counties. Through extensive input from member jurisdictions, the inaugural Local Profiles reports were released at the SCAG General Assembly in May 2009. The Local Profiles have since been updated every two years.

The Local Profiles reports provide a variety of demographic, economic, education, housing, and transportation information about each member jurisdiction including, but not limited to, the following:

- How much growth in population has taken place since 2000?
- Has the local jurisdiction been growing faster or slower than the county or regional average?
- Have there been more or fewer school-age children?
- Have homeownership rates been increasing or decreasing?
- How and where do residents travel to work?
- How has the local economy been changing in terms of employment share by sector?

Answers to questions such as these provide a snapshot of the dynamic changes affecting each local jurisdiction.

The purpose of this report is to provide current information and data for the City of Vernon for planning and outreach efforts. Information on population, housing, transportation, employment, retail sales, and education can be utilized by the city to make well informed planning decisions. The report provides a portrait of the city and its changes since 2000, using average figures for Los Angeles County as a comparative baseline. In addition, the most current data available for the region is also included in the Statistical Summary (page 3). This report illustrates current trends occurring in the City of Vernon.

Factors Affecting Local Changes Reflected in the 2019 Report

Overall, member jurisdictions since 2000 have been impacted by a variety of factors at the national, regional, and local levels. For example, the vast majority of member jurisdictions included in the 2019 Local Profiles reflect national demographic trends toward an older and more diverse population. Evidence of continued economic growth is also apparent through increases in employment, retail sales, building permits, and home prices. Work destinations and commute times correlate with regional development patterns and the location of local jurisdictions, particularly in relation to the regional transportation system.

Uses of the Local Profiles

Following release at the SCAG General Assembly, the Local Profiles are posted on the SCAG website and are used for a variety of purposes including, but not limited to, the following:

- As a data and communications resource for elected officials, businesses, and residents
- Community planning and outreach
- Economic development
- Visioning initiatives
- Grant application support
- Performance monitoring

The primary user groups of the Local Profiles include member jurisdictions and state and federal legislative delegates of Southern California. This report is a SCAG member benefit and the use of the data contained within this report is voluntary.

Report Organization

This report includes three sections. The first section presents a 'Statistical Summary' for City of Vernon. The second section provides detailed information organized by subject area and includes brief highlights of some of the trends identified by that information. The third section, 'Methodology', describes technical considerations related to data definitions, measurement, and sources.

2018 STATISTICAL SUMMARY

<i>Category</i>	<i>Vernon</i>	<i>Los Angeles County</i>	<i>Vernon Relative to Los Angeles County*</i>	<i>SCAG Region</i>
2018 Total Population	209	10,283,729	[0.002%]	19,145,421
2018 Population Density (Persons per Square Mile)	42	2,518	-2,476	494
2018 Median Age (Years)	34.3	36.0	-1.7	35.8
2018 Hispanic	72.4%	48.4%	24.0%	46.5%
2018 Non-Hispanic White	9.2%	26.5%	-17.3%	31.4%
2018 Non-Hispanic Asian	6.6%	14.3%	-7.7%	12.8%
2018 Non-Hispanic Black	11.8%	7.9%	3.9%	6.3%
2018 Non-Hispanic American Indian or Alaska Native	0.0%	0.2%	-0.2%	0.2%
2018 All Other Non-Hispanic	0.0%	2.7%	-2.7%	2.8%
2018 Number of Households	74	3,338,658	[0.002%]	6,132,938
2018 Average Household Size	2.8	3.0	-0.2	3.1
2018 Median Household Income	\$66,250	\$61,015	\$5,235	\$64,989
2018 Number of Housing Units	76	3,546,863	[0.002%]	6,629,879
2018 Homeownership Rate	23.3%	52.4%	-29.1%	52.4%
2018 Median Existing Home Sales Price	N/A	\$597,500	N/A	\$561,000
2017 - 2018 Median Home Sales Price Change	N/A	6.7%	N/A	6.5%
2018 Drive Alone to Work	66.7%	73.7%	-7.0%	75.8%
2018 Mean Travel Time to Work (minutes)	21.3	30.9	-9.6	30.2
2017 Number of Jobs	43,357	4,767,204	[0.9%]	8,465,304
2016 - 2017 Total Jobs Change	106	23,801	[0.5%]	76,197
2017 Average Salary per Job	\$53,557	\$66,037	-12,480	\$60,956
2018 K-12 Public School Student Enrollment	226	1,482,258	[0.0%]	2,975,283

Sources: U.S. Census American Community Survey, 2017; Nielsen Co.; California Department of Finance E-5, May 2018; CoreLogic/DataQuick; California Department of Education; and SCAG

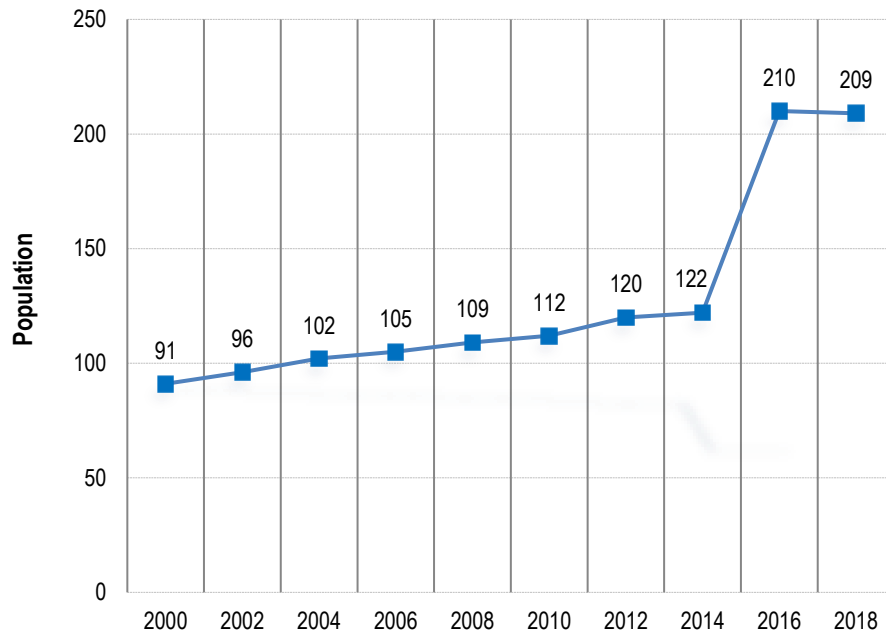
* Numbers with [] represent Vernon's share of Los Angeles County. The unbracketed numbers represent the difference between Vernon and Los Angeles County.

Mapped jurisdictional boundaries are as of July 1, 2016 and are for visual purposes only. Report data, however, are updated according to their respective sources.

II. POPULATION

Population Growth

Population: 2000 - 2018

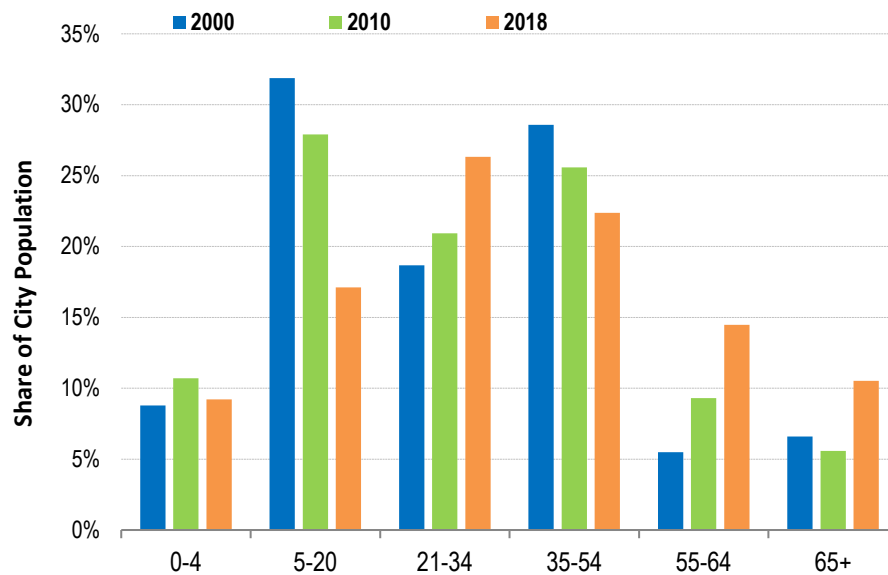


Source: California Department of Finance, E-5, 2000-2018

- Between 2000 and 2018, the total population of the City of Vernon increased by 118 to 209.
- During this 18-year period, the city's population growth rate of 129.7 percent was higher than the Los Angeles County rate of 8 percent.
- 0.002 percent of the total population of Los Angeles County is in the City of Vernon.
- Population values for 2000 and 2010 are from the U.S. Decennial Census.
- Values for other years are estimates by the California Department of Finance.

Population by Age Range

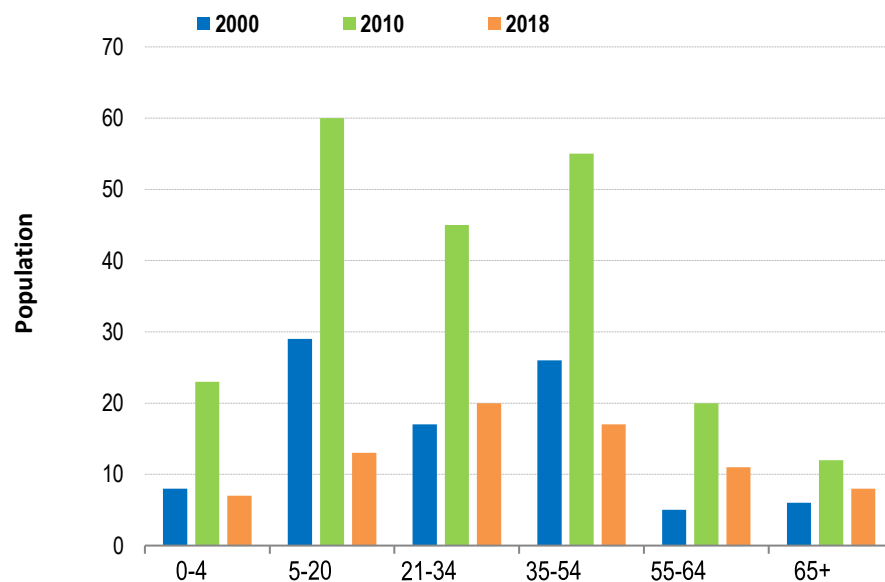
Population Share by Age: 2000, 2010, and 2018



Sources: 2000 & 2010 U.S. Decennial Census; American Community Survey, 2017; Nielsen Co.

- Between 2000 and 2018, the 55-64 age group experienced the largest increase in share, growing from 5.5 to 14.5 percent.
- The age group that experienced the greatest decline in share was 5-20, decreasing from 31.9 to 17.1 percent.

Population by Age: 2000, 2010, and 2018

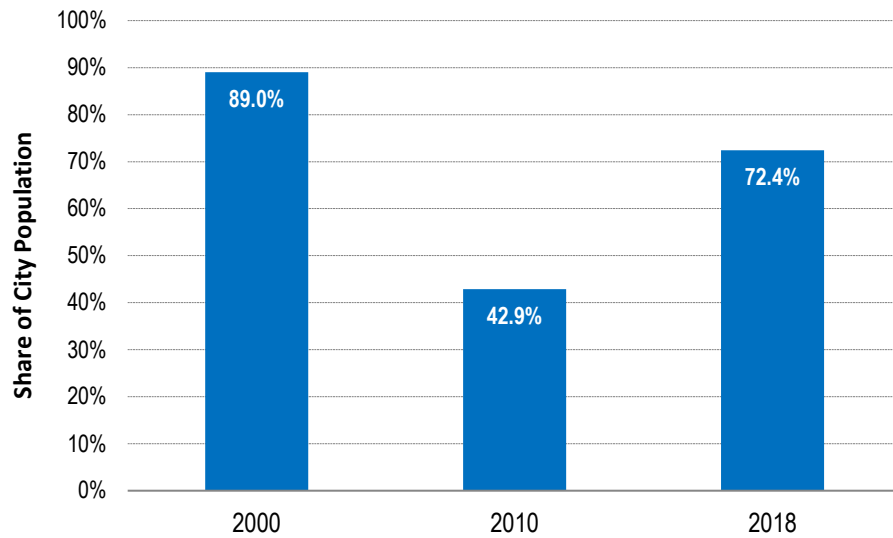


Sources: 2000 & 2010 U.S. Decennial Census; American Community Survey, 2017; Nielsen Co.

- The 55-64 age group added the most population, with an increase of 6 people between 2000 and 2018.

Population by Race/Ethnicity

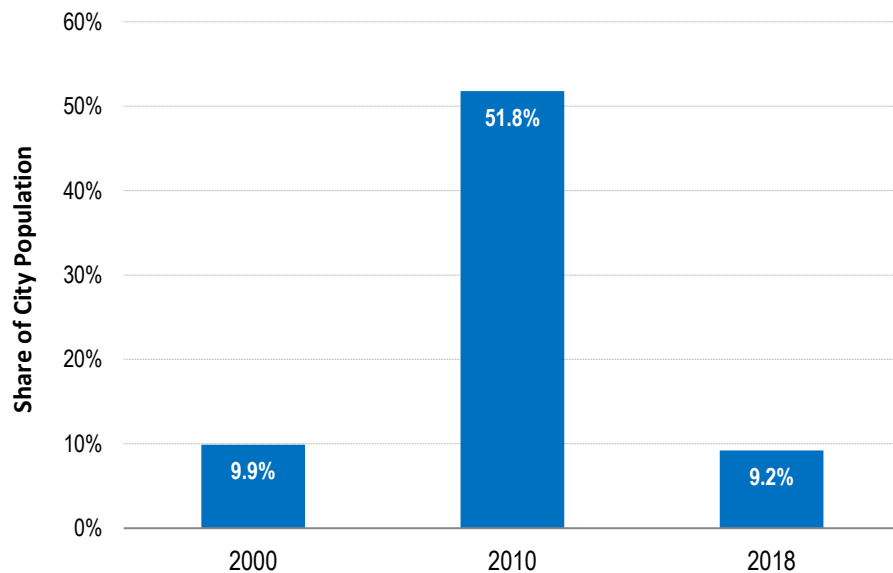
Hispanic or Latino of Any Race: 2000, 2010, and 2018



Sources: 2000 & 2010 U.S. Decennial Census; American Community Survey, 2017; Nielsen Co.

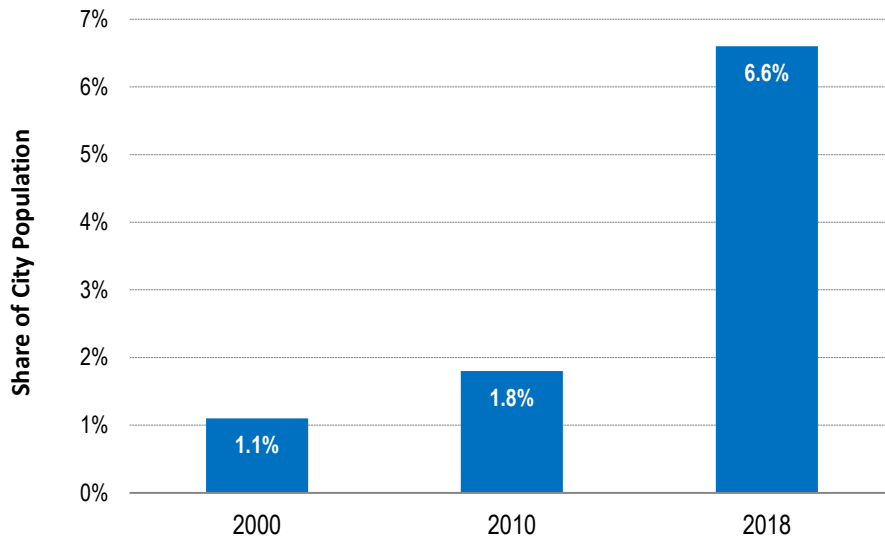
- Between 2000 and 2018, the share of Hispanic population in the city decreased from 89.0 percent to 72.4 percent.

Non-Hispanic White: 2000, 2010, and 2018



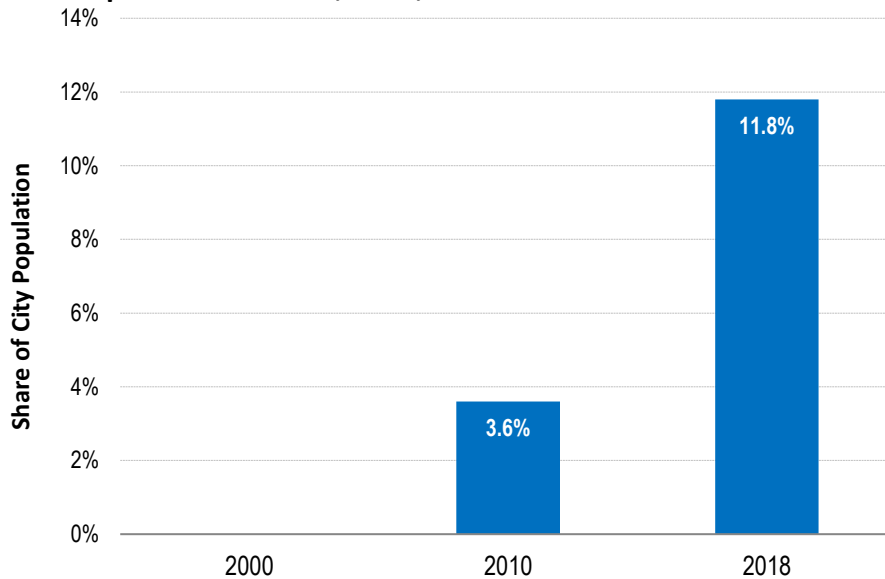
Sources: 2000 & 2010 U.S. Decennial Census; American Community Survey, 2017; Nielsen Co.

- Between 2000 and 2018, the share of Non-Hispanic White population in the city decreased from 9.9 percent to 9.2 percent.
- Please refer to the Methodology section for definitions of the racial/ethnic categories.

Non-Hispanic Asian: 2000, 2010, and 2018

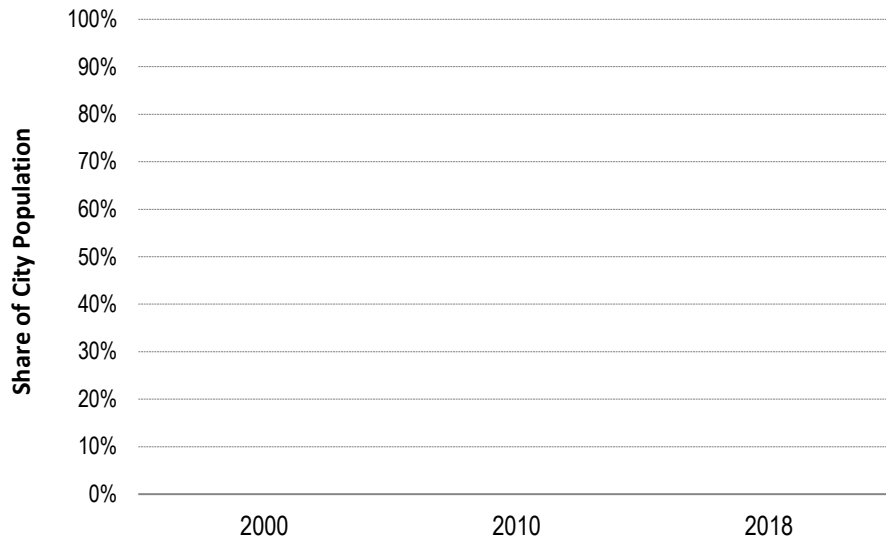
Sources: 2000 & 2010 U.S. Decennial Census; American Community Survey, 2017; Nielsen Co.

- Between 2000 and 2018, the share of Non-Hispanic Asian population in the city increased from 1.1 percent to 6.6 percent.

Non-Hispanic Black: 2000, 2010, and 2018

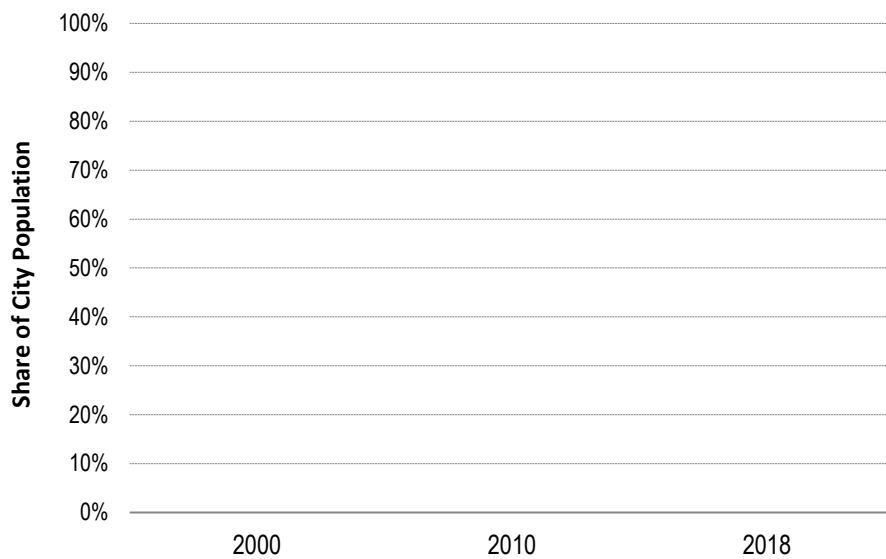
Sources: 2000 & 2010 U.S. Decennial Census; American Community Survey, 2017; Nielsen Co.

- Between 2000 and 2018, the share of Non-Hispanic Black population in the city increased from 0.0 percent to 11.8 percent.

Non-Hispanic American Indian or Alaska Native: 2000, 2010, & 2018

Sources: 2000 & 2010 U.S. Decennial Census; American Community Survey, 2017; Nielsen Co.

- Between 2000 and 2018, the share of Non-Hispanic American Indian or Alaska Native population in the city remained at 0 percent.

All Other Non-Hispanic: 2000, 2010, and 2018

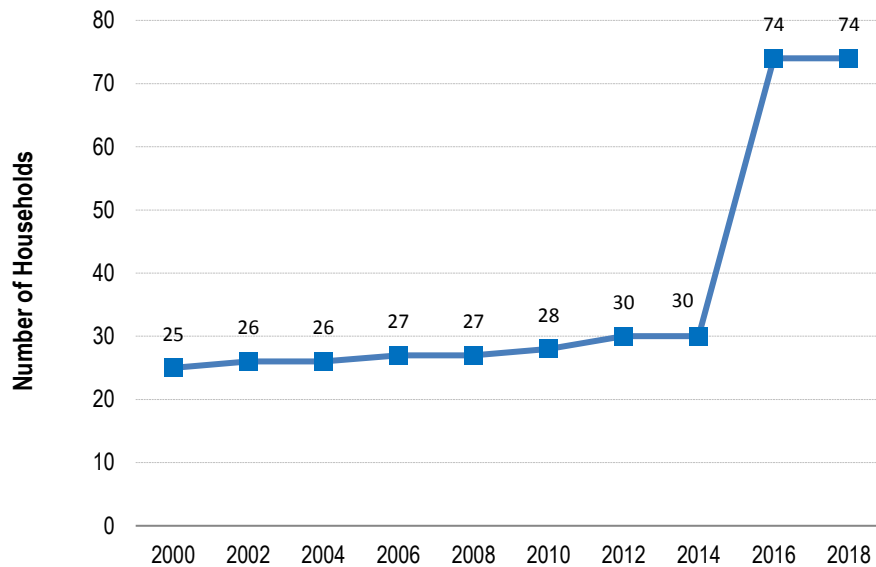
Sources: 2000 & 2010 U.S. Decennial Census; American Community Survey, 2017; Nielsen Co.

- Between 2000 and 2018, the share of All Other Non-Hispanic population group in the city remained at 0 percent.

III. HOUSEHOLDS

Number of Households (Occupied Housing Units)

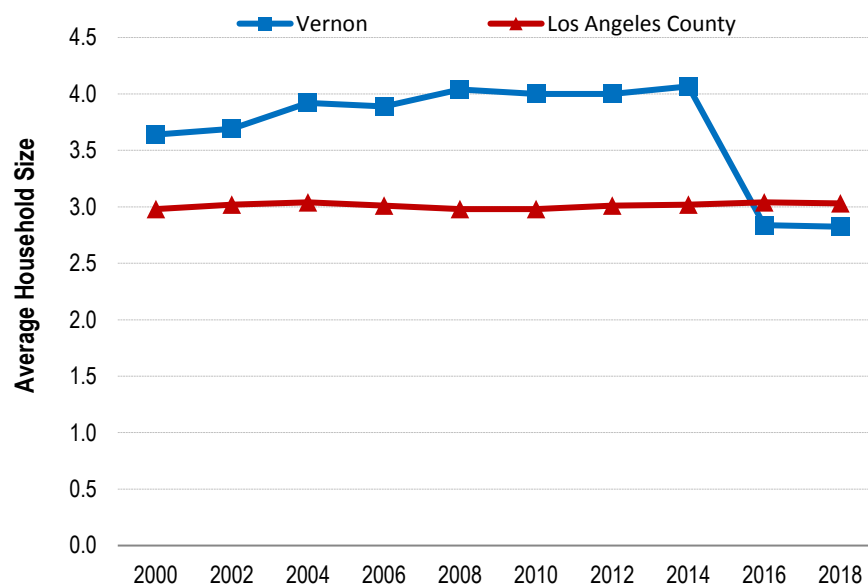
Number of Households: 2000 - 2018



Sources: California Department of Finance, E-5, 2000-2018

- Between 2000 and 2018, the total number of households in the City of Vernon increased by 49 units, or 196 percent.
- During this 18-year period, the city's household growth rate of 196 percent was higher than the county growth rate of 6.5 percent.
- 0.002 percent of Los Angeles County's total number of households are in the City of Vernon.
- In 2018, the city's average household size was 2.8, lower than the county average of 3.0.

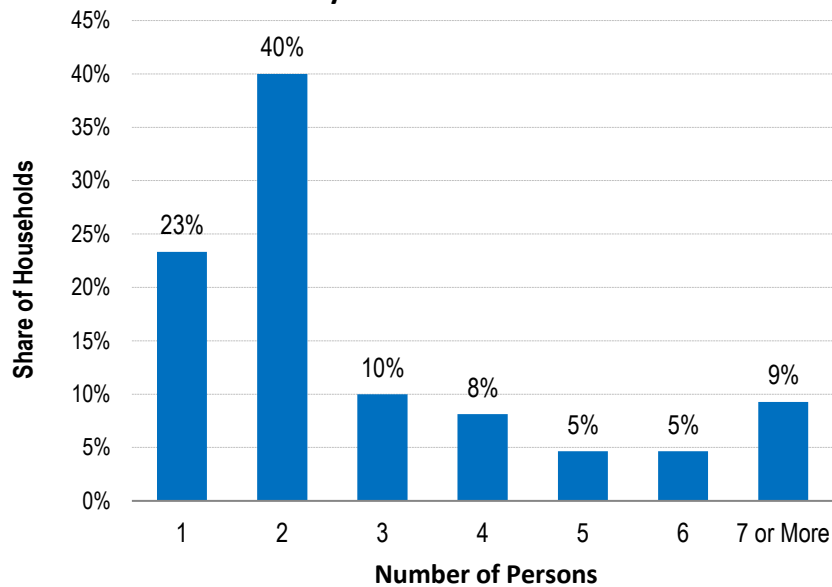
Average Household Size: 2000 - 2018



Source: California Department of Finance, E-5, 2000-2018

Households by Size

Percent of Households by Household Size: 2018

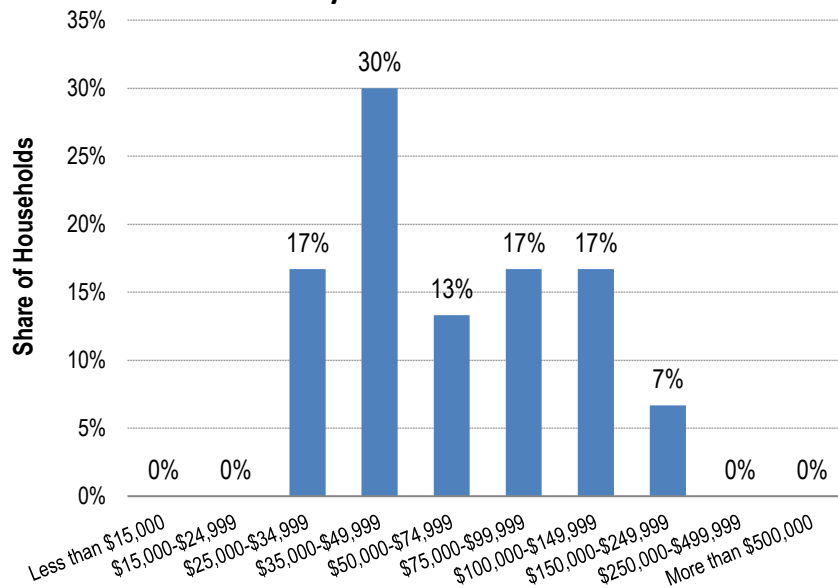


Source: U.S. Census American Community Survey, 2017; Nielsen Co.

- In 2018, 73.3 percent of all city households had 3 people or fewer.
- About 23 percent of the households were single-person households.
- Approximately 19 percent of all households in the city had 5 people or more.

Households by Income

Percent of Households by Household Income: 2018

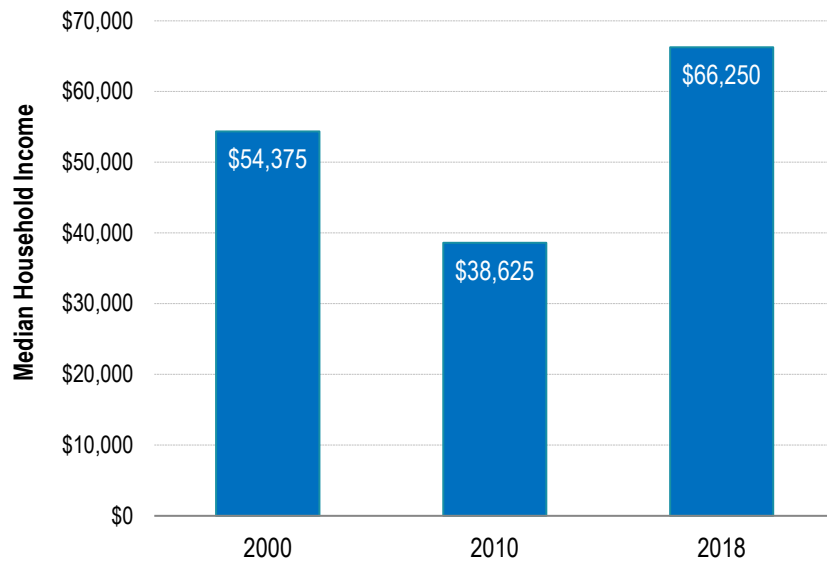


Source: U.S. Census American Community Survey, 2017; Nielsen Co.

- In 2018, about 47 percent of households earned less than \$50,000 annually.
- Approximately 24 percent of households earned \$100,000 or more.

Household Income

Median Household Income: 2000, 2010, and 2018

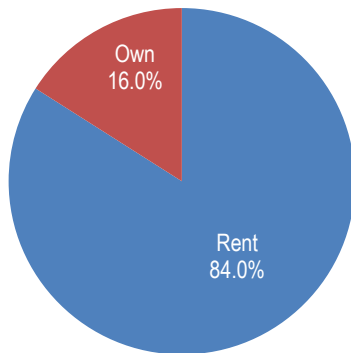


- From 2000 to 2018, median household income increased by \$11,875.
- Note: Dollars are not adjusted for annual inflation.

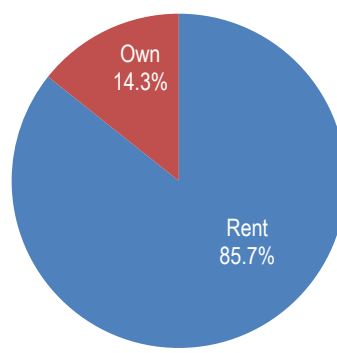
Source: 2000 & 2010 U.S. Decennial Census; American Community Survey, 2017; Nielsen Co.

Renters and Homeowners

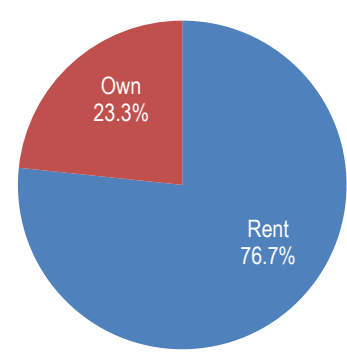
Percentage of Renters and Homeowners: 2000, 2010, and 2018



2000



2010



2018

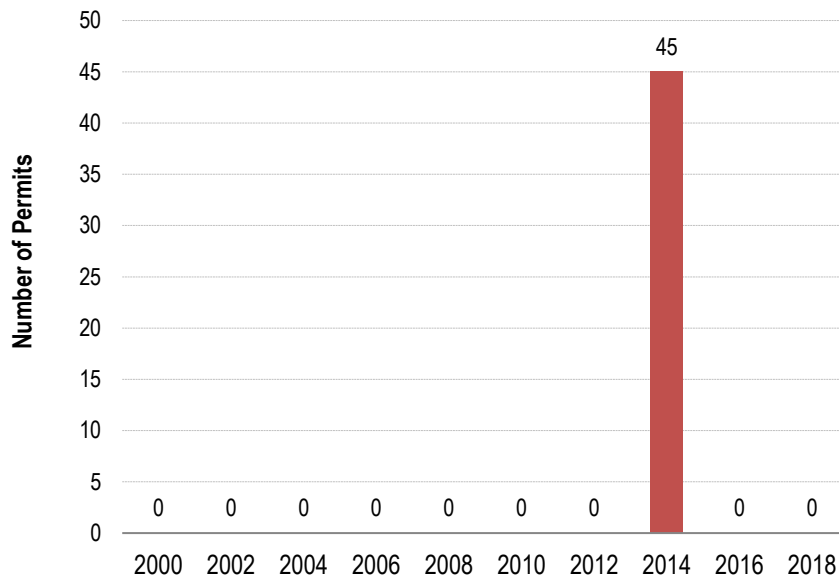
Sources: 2000 & 2010 U.S. Decennial Census; American Community Survey, 2017; Nielsen Co.

- Between 2000 and 2018, homeownership rates increased and the share of renters decreased.

IV. HOUSING

Total Housing Production

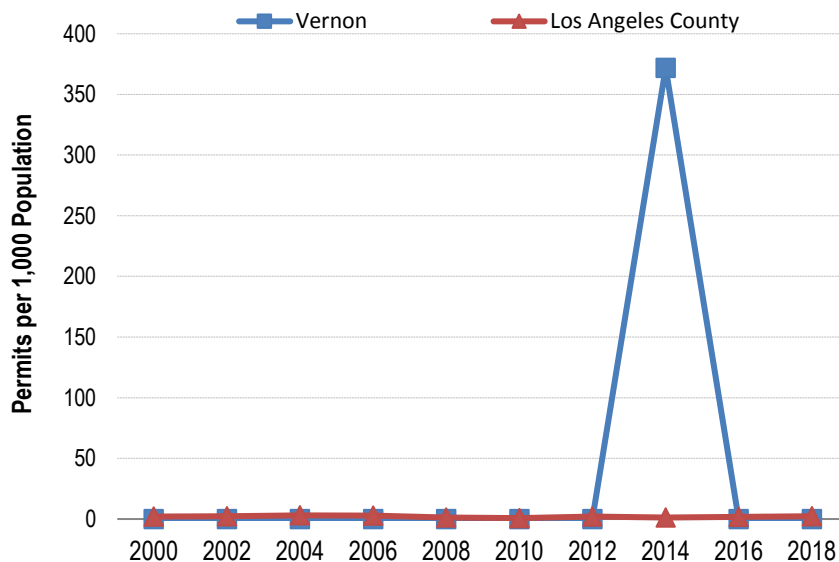
Total Residential Units Permitted: 2000 - 2018



Source: Construction Industry Research Board, 2000 - 2018

- In 2018, no permits were issued for residential units.

Total Residential Units Permitted per 1,000 Residents: 2000 - 2018



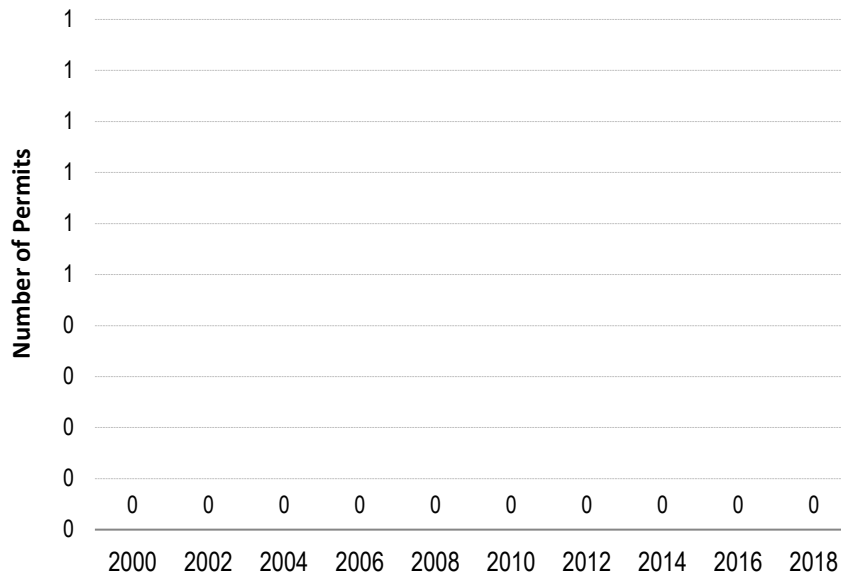
Source: Construction Industry Research Board, 2000 - 2018

- In 2000, the City of Vernon had 0 permits per 1,000 residents compared to the overall county figure of 2 permits per 1,000 residents.
- For the city in 2018, the number of permits per 1,000 residents remained at 0 permits. For the county overall, it increased to 2.2 permits per 1,000 residents.

Single-Family Housing Production

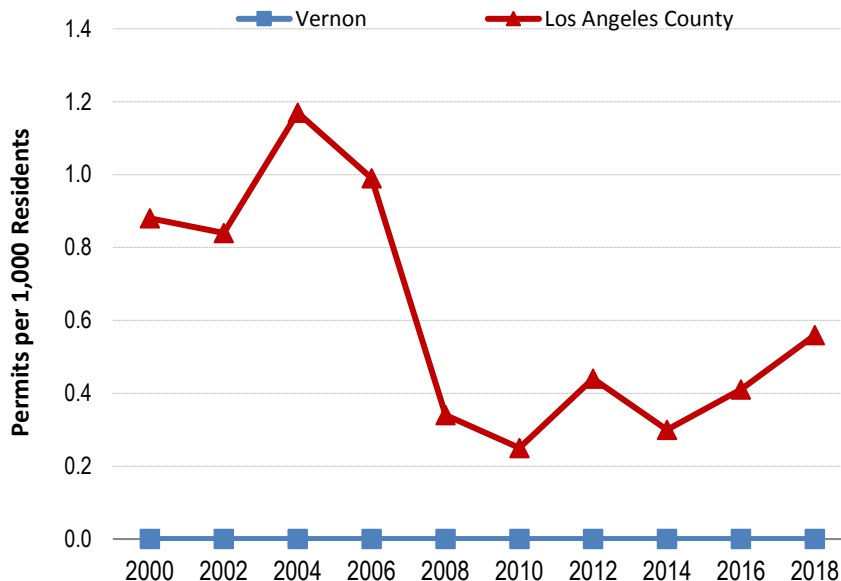
- In 2018, no permits were issued for single family homes.

Single-Family Units Permitted: 2000 - 2018



Source: Construction Industry Research Board, 2000 - 2018

Single-Family Units Permitted per 1,000 Residents: 2000 - 2018

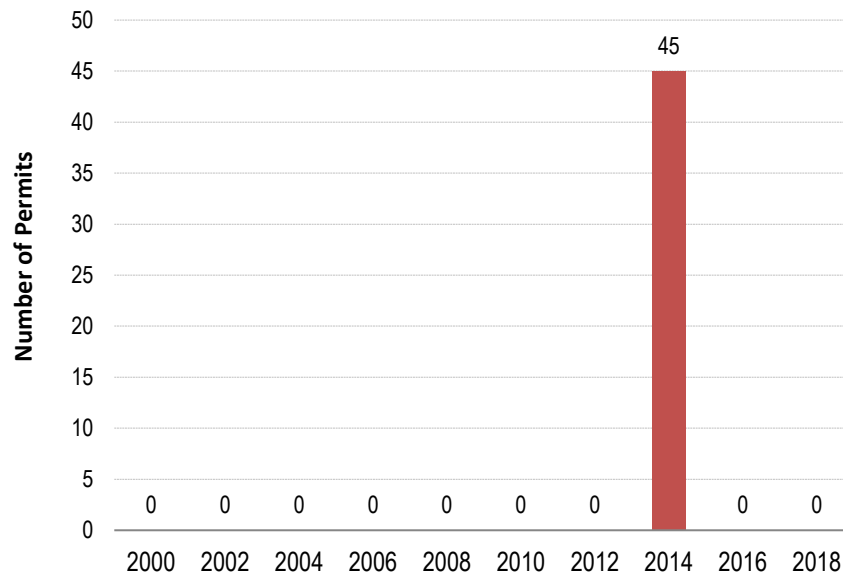


Source: Construction Industry Research Board, 2000 - 2018

- In 2000, the City of Vernon issued 0 permits per 1,000 residents compared to the overall county figure of 0.9 permits per 1,000 residents.
- For the city in 2018, the number of permits issued per 1,000 residents remained at 0 permits. For the county overall, it decreased to 0.6 permits per 1,000 residents.

Multi-Family Housing Production

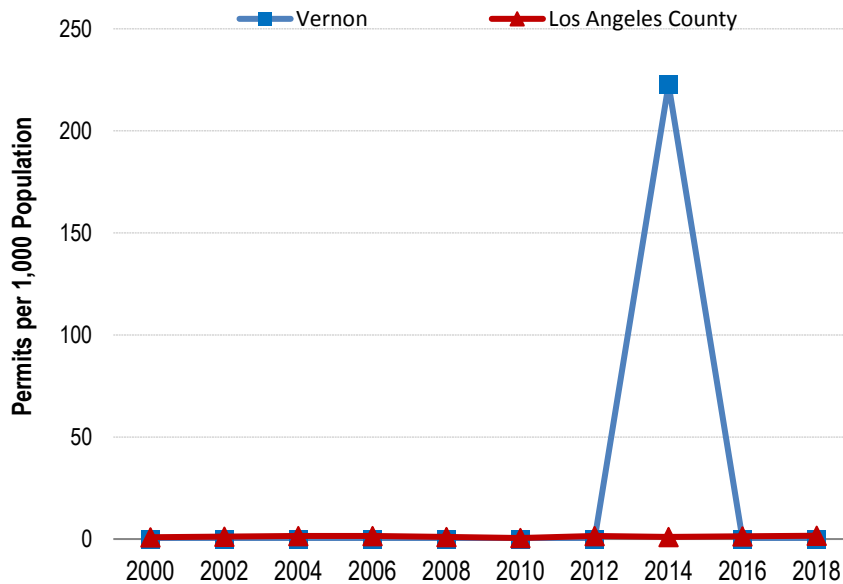
Multi-Family Units Permitted: 2000 - 2018



Source: Construction Industry Research Board, 2000-2018

- In 2018, no permits were issued for multi-family residential units.

Multi-Family Units Permitted per 1,000 Residents: 2000 - 2018

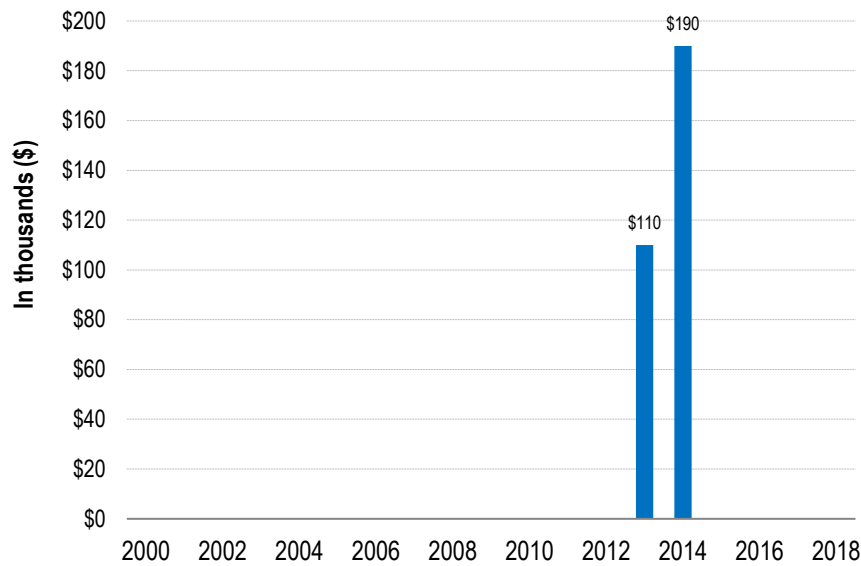


Source: Construction Industry Research Board, 2000-2018

- For the city in 2018, the number of permits per 1,000 residents remained at 0 permits. For the county overall, it increased to 1.6 permits per 1,000 residents.

Home Sales Prices

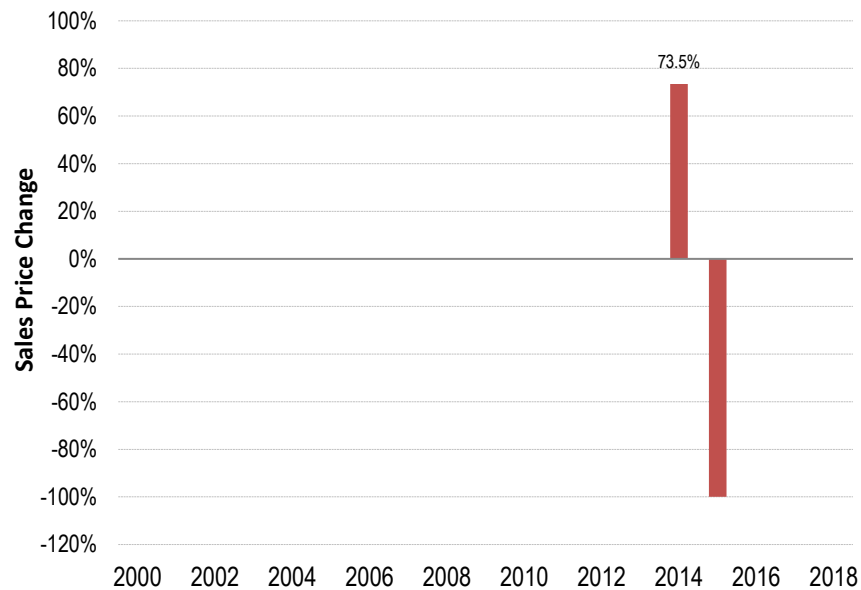
Median Home Sales Price for Existing Homes: 2000 - 2018 \$ thousands)



Source: CoreLogic/DataQuick, 2000-2018

- Median home sales price data is not currently available for the City of Vernon (except for 2013 and 2014).
- Note: Median home sales price reflects resale of existing homes, which varies due to type of units sold.
- Annual median home sales prices are not adjusted for inflation.

Annual Median Home Sales Price Change for Existing Homes: 2000 - 2018



Source: CoreLogic/DataQuick, 2000-2018

HOUSING TYPE

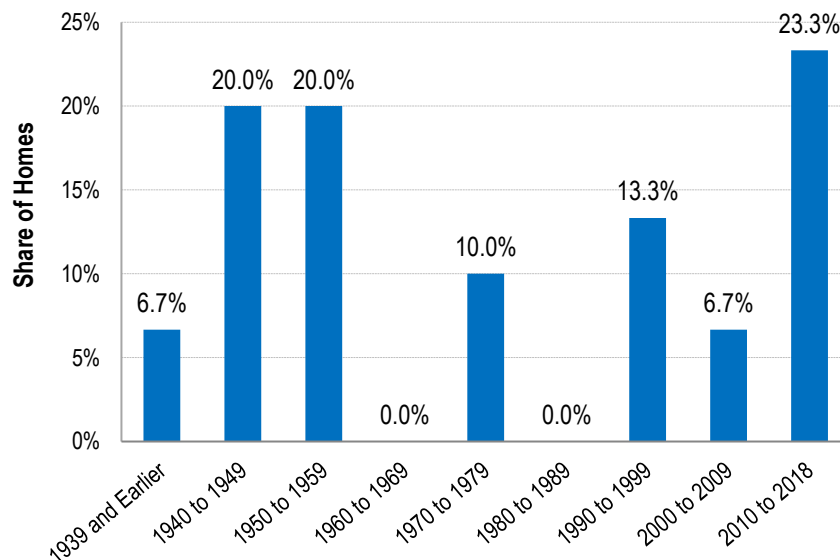
Housing Type by Units: 2018

Housing Type	Number of Units	Percent of Total Units
Single Family Detached	23	30.3 %
Single Family Attached	0	0.0 %
Multi-family: 2 to 4 units	0	0.0 %
Multi-family: 5 units plus	53	69.7 %
Mobile Home	0	0.0 %
Total	76	100.0 %

- The most common housing type is 5 plus.
- Approximately 30 percent are single family homes and 70 percent are multi-family homes.

Source: California Department of Finance, E-5, 2018

Age of Housing Stock: 2018

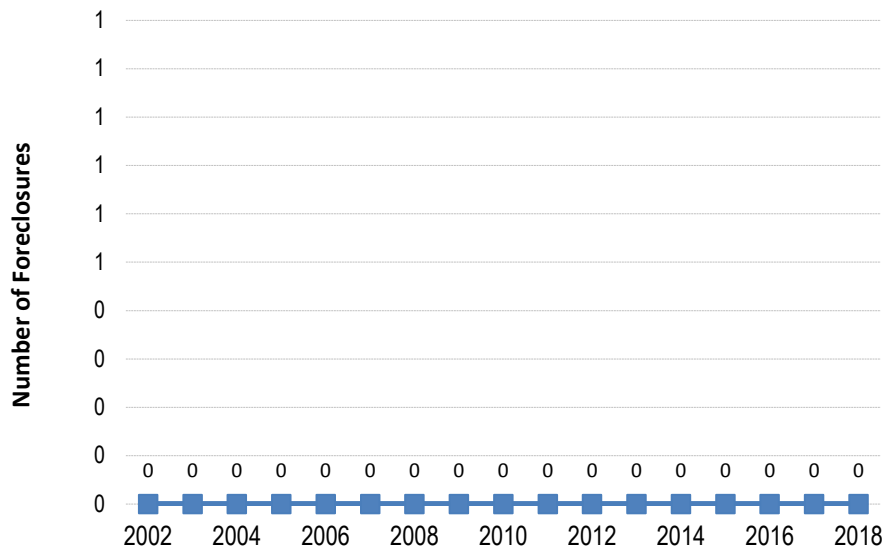


Source: U.S. Census American Community Survey, 2017; Nielsen Co.

- 46.7 percent of the housing stock was built before 1970.
- 53.3 percent of the housing stock was built after 1970.

Foreclosures

Number of Foreclosures: 2002 - 2018

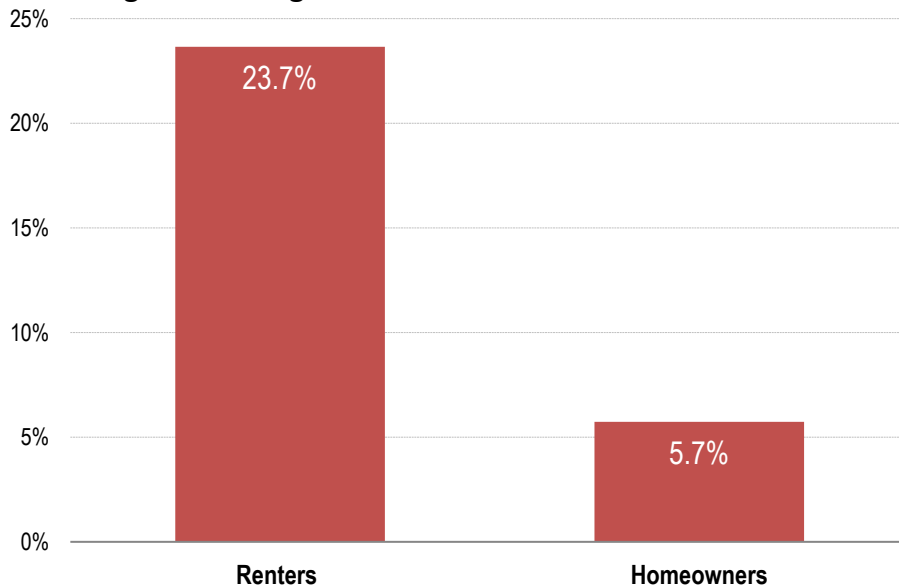


- There were no foreclosures in 2018.
- Between 2007 and 2018, there were no foreclosures.

Source: CoreLogic/DataQuick, 2002-2018

Housing Cost Share

Percentage of Housing Cost for Renters and Homeowners: 2017



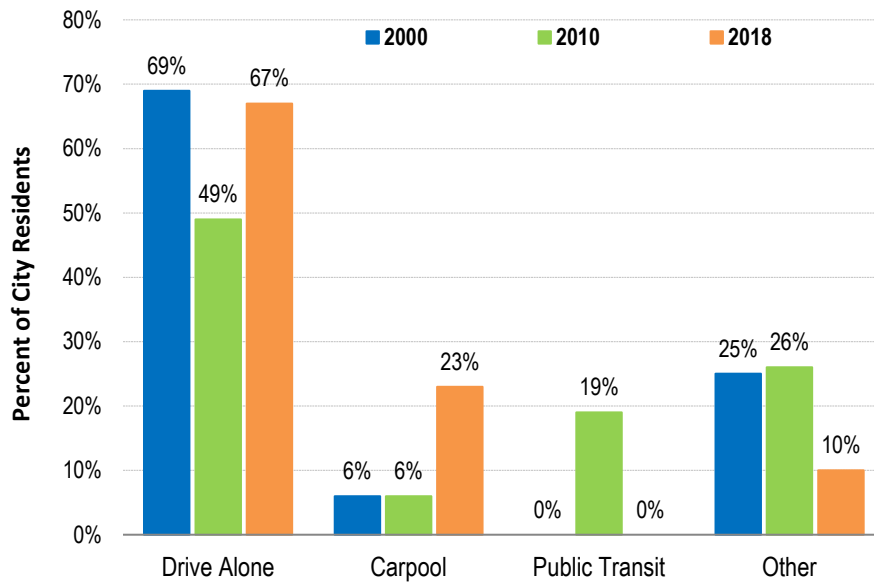
- Housing costs accounted for an average of 23.7 percent of total household income for renters.
- Housing costs accounted for an average of 5.7 percent of total household income for homeowners.

Source: U.S. Census American Community Survey, 2017

V. TRANSPORTATION

Journey to Work for Residents

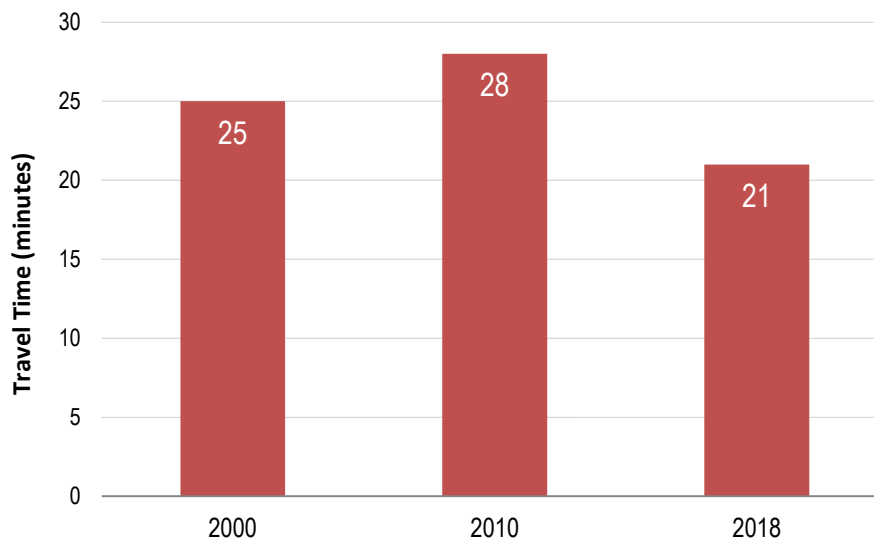
Transportation Mode Choice: 2000, 2010, and 2018



Sources: 2000 & 2010 U.S. Decennial Census; American Community Survey, 2017; Nielsen Co.

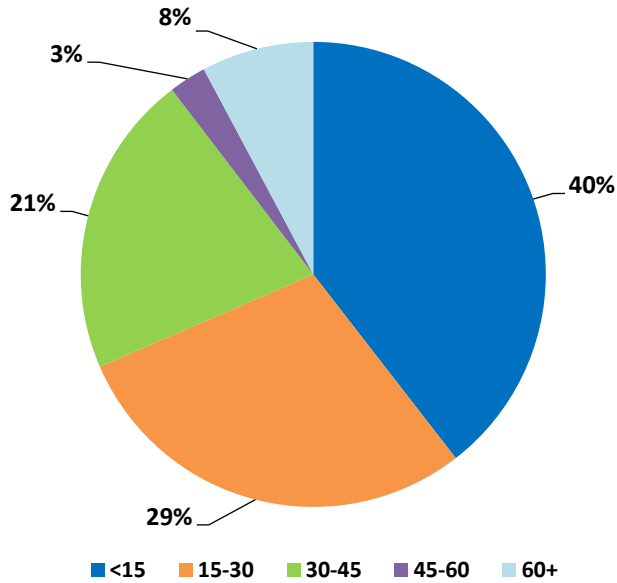
- Between 2000 and 2018, the greatest change occurred in the percentage of individuals who traveled to work by carpool; this share increased by 17.5 percentage points.
- 'Other' refers to bicycle, pedestrian, and home-based employment.

Average Travel Time (minutes): 2000, 2010, and 2018



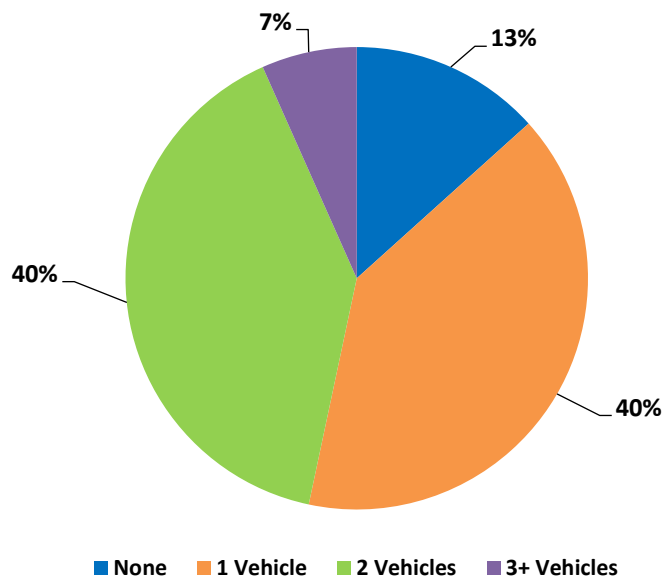
Sources: 2000 & 2010 U.S. Decennial Census; American Community Survey, 2017; Nielsen Co.

- Between 2000 and 2018, the average travel time to work decreased by approximately 4 minutes.

Travel Time to Work (Range of Minutes): 2018

- In 2018, 31.5 percent of Vernon commuters spent more than 30 minutes to travel to work.
- Travel time to work figures reflect average one-way commute travel times, not round trip.

Sources: U.S. Census American Community Survey, 2017; Nielsen Co.

Household Vehicle Ownership: 2018

- 53.3 percent of Vernon households own one or no vehicles, while 46.7 percent of households own two or more vehicles.

Sources: U.S. Census American Community Survey, 2017; Nielsen Co.

VI. ACTIVE TRANSPORTATION

Over the course of the next 25 years, population growth and demographic shifts will continue to transform the character of the SCAG region and the demands placed on it for livability, mobility, and overall quality of life. Our future will be shaped by our response to this growth and the demands it places on our systems.

SCAG is responding to these challenges by embracing sustainable mobility options, including support for enhanced active transportation infrastructure. Providing appropriate facilities to help make walking and biking more attractive and safe transportation options will serve our region through reduction of traffic congestion, decreasing greenhouse gas emissions, improving public health, and enhanced communities.

For the 2017 Local Profiles, SCAG began providing information on the active transportation resources being implemented throughout our region. The 2019 Local Profiles continues the active transportation element with a compilation of bicycle lane mileage by facility type at the county level. This data, provided by our County Transportation Commissions for the years 2012 and 2016, provides a baseline to measure regional progress in the development of active transportation resources over time.

The Local Profiles reports will seek to provide additional active transportation data resources as they become available at the local jurisdictional level. Information on rates of physical activity (walking) is available in the Public Health section of this report.

Bike Lane Mileage by Class: 2012-2016

County	Class 1		Class 2		Class 3		Class 4		Total Lane Miles		
	2012	2016	2012	2016	2012	2016	2012	2016	2012	2016	Change
Imperial	3	3	4	4	82	82	0	0	89	89	0.0%
Los Angeles	302	343	659	1,054	519	609	2	7	1,482	2,013	35.8%
Orange	259	264	706	768	87	103	0	0	1,052	1,135	7.9%
Riverside	44	44	248	248	129	129	0	0	421	421	0.0%
San Bernardino	77	96	276	293	150	107	0	0	503	496	-1.4%
Ventura	61	76	257	333	54	77	0	0	372	486	30.6%
SCAG Region	746	826	2,150	2,700	1,021	1,107	2	7	3,919	4,640	18.4%

Source: County Transportation Commissions: 2012, 2016

Class 1 (Bike Path): Separated off-road path for the exclusive use of bicycles and pedestrians.

Class 2 (Bike Lane): Striped on-road lane for bike travel along a roadway.

Class 3 (Bike Route): Roadway dedicated for shared use by pedestrians, bicyclists, and motor vehicles.

Class 4 (Protected Bike Lane): Lane separated from motor vehicle traffic by more than striping (grade separation or barrier).

VII. EMPLOYMENT

Employment Centers

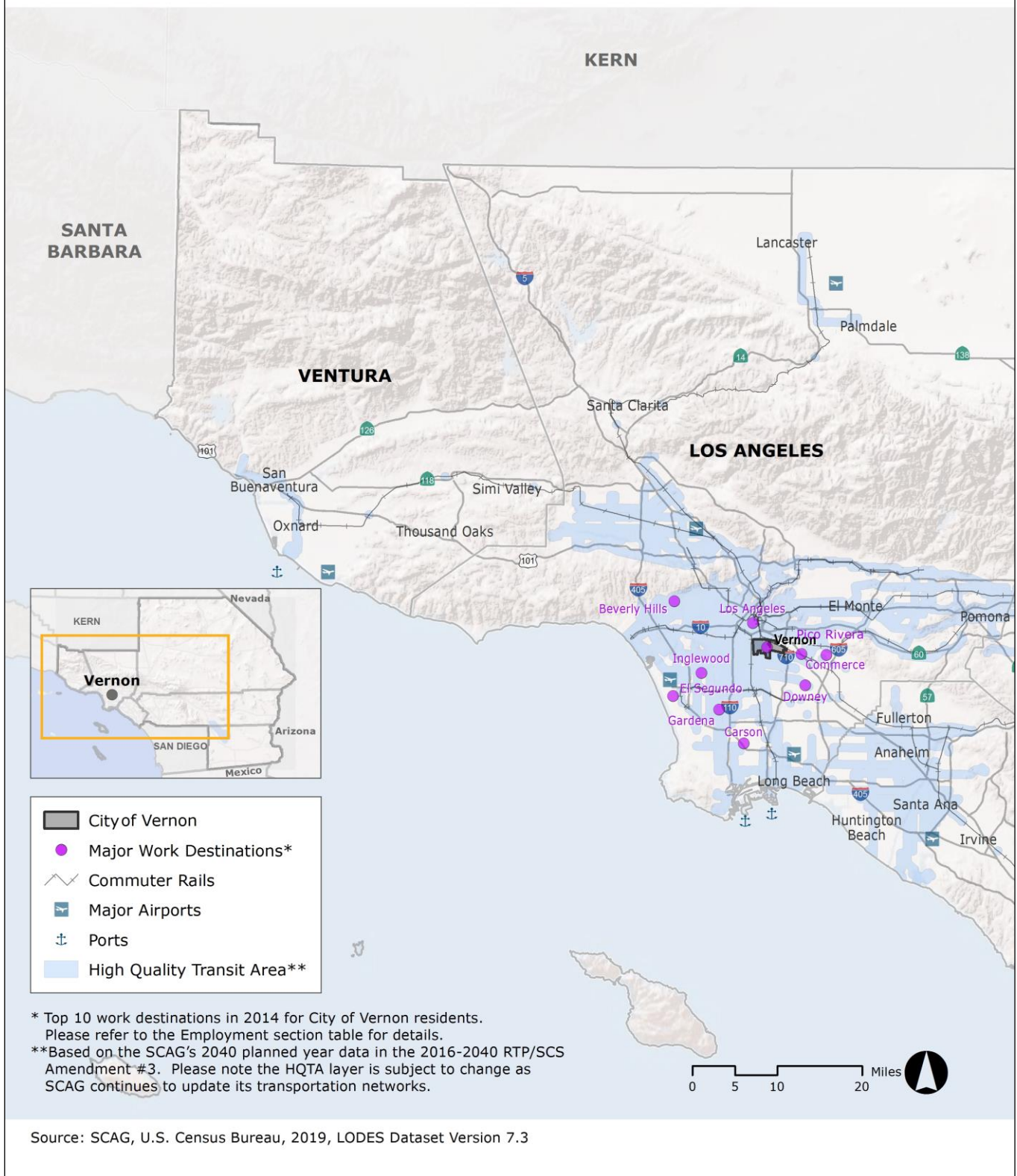
Top 10 Places Where Vernon Residents Commute to Work: 2016

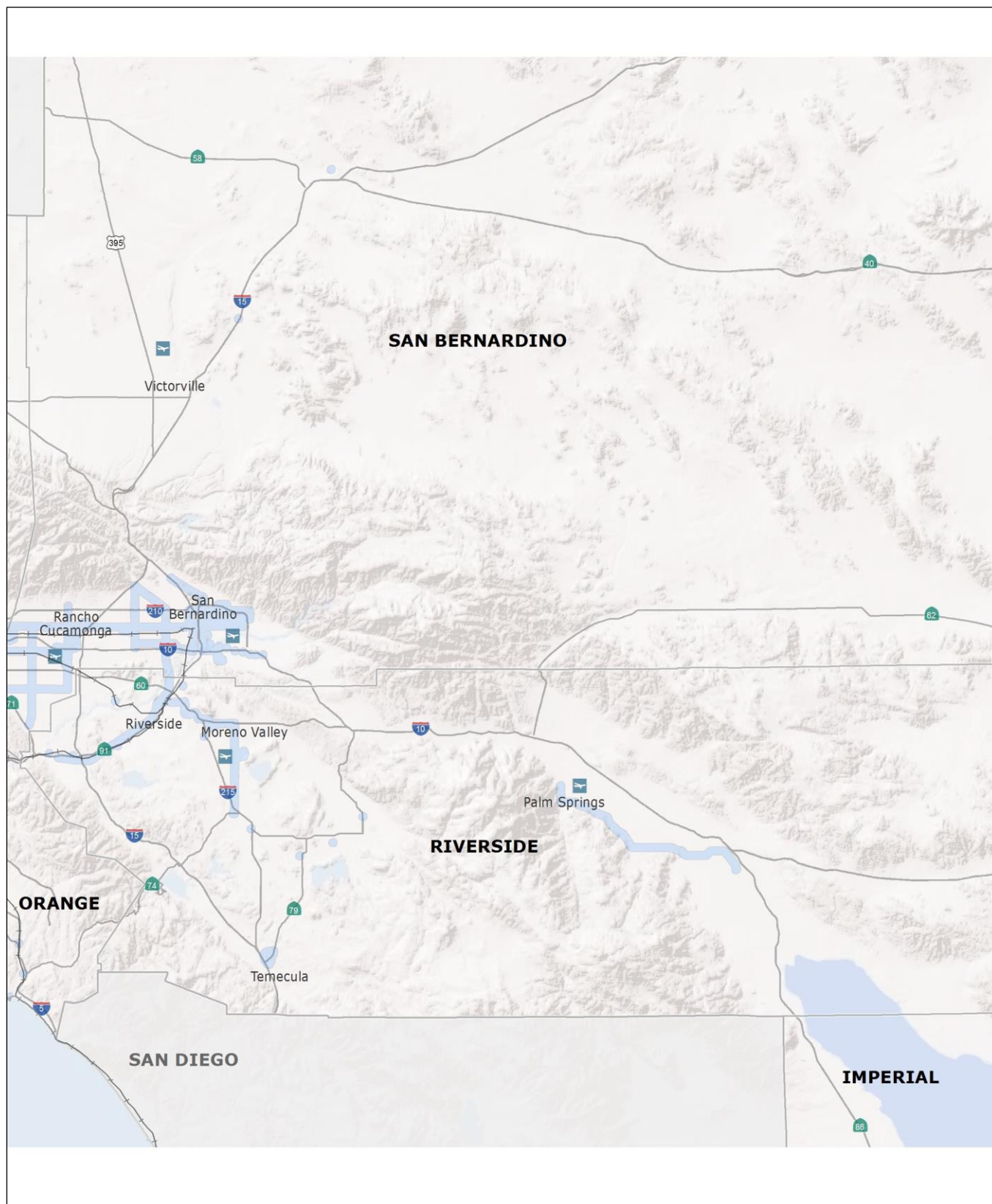
Local Jurisdiction		Number of Commuters	Percent of Total Commuters
1.	Vernon	244	53.4 %
2.	Los Angeles	80	17.5 %
3.	Commerce	8	1.8 %
4.	Carson	6	1.3 %
5.	El Segundo	5	1.1 %
6.	Inglewood	5	1.1 %
7.	Pico Rivera	5	1.1 %
8.	Beverly Hills	4	0.9 %
9.	Downey	4	0.9 %
10.	Gardena	4	0.9 %
All Other Destinations		92	20.1 %

Source: U.S. Census Bureau, 2017, LODES Data; Longitudinal-Employer Household Dynamics Program: <https://lehd.ces.census.gov/data/lodes/>

- This table identifies the top 10 locations where residents from City of Vernon commute to work.
- 53.4% work and live in Vernon, while 46.6% commute to other places.

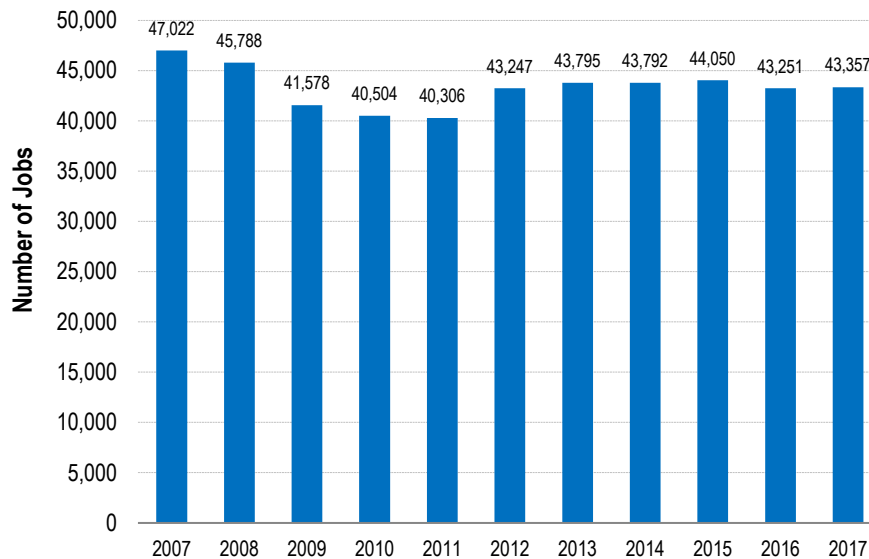
MAJOR WORK DESTINATIONS





Total Jobs

Total Jobs: 2007 - 2017

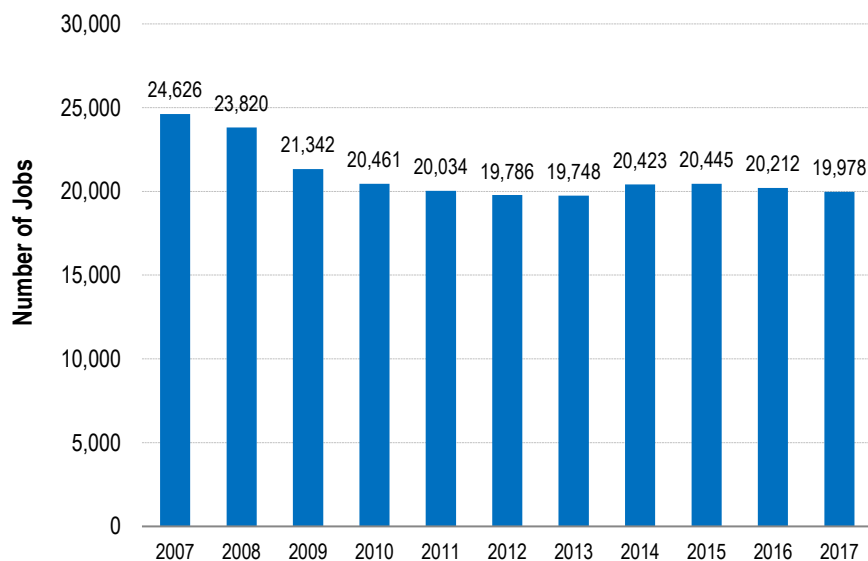


Sources: California Employment Development Department, 2007 - 2017; InfoGroup; & SCAG

- Total jobs include wage and salary jobs and jobs held by business owners and self-employed persons.
- The total job count does not include unpaid volunteers or family workers, and private household workers.
- In 2017, total jobs in the City of Vernon numbered 43,357, a decrease of 7.8 percent from 2007.

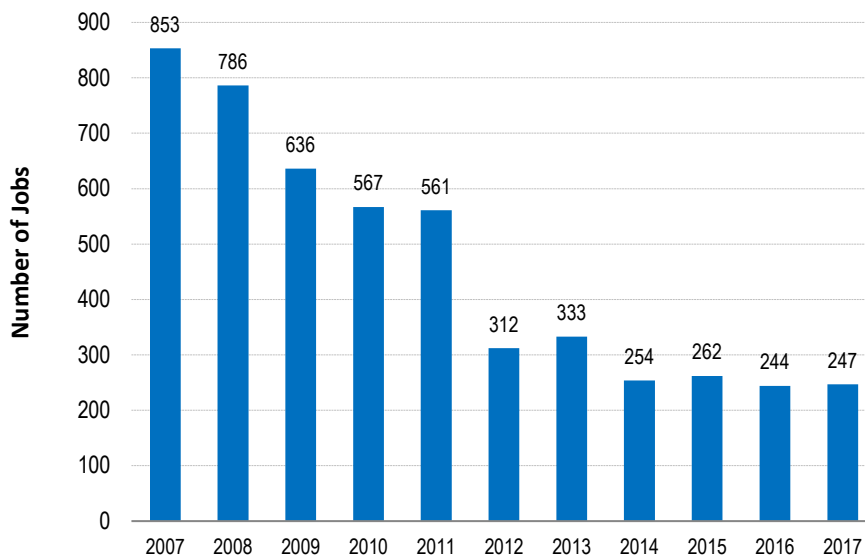
Jobs by Sector

Jobs in Manufacturing: 2007 - 2017



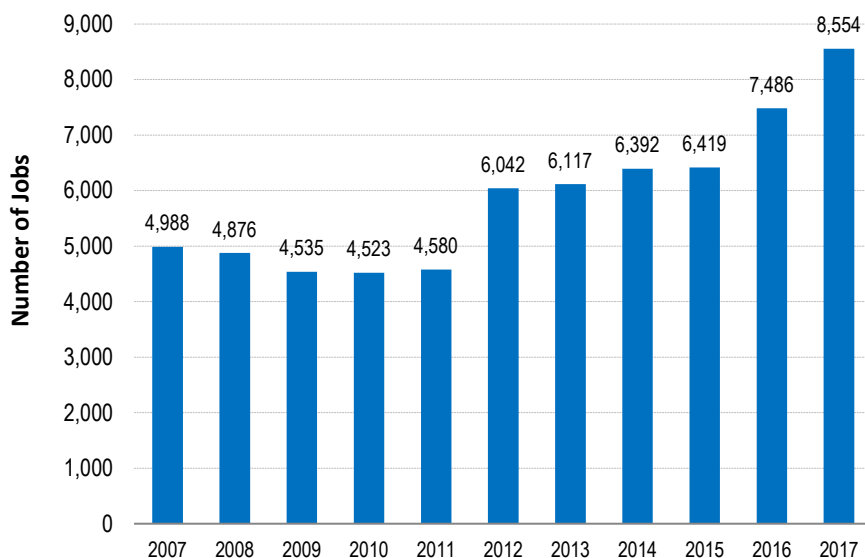
Sources: California Employment Development Department, 2007 - 2017; InfoGroup; & SCAG

- Manufacturing jobs include those employed in various sectors including food; apparel; metal; petroleum and coal; machinery; computer and electronic products; and transportation equipment.
- Between 2007 and 2017, the number of manufacturing jobs in the city decreased by 18.9 percent.

Jobs in Construction: 2007 - 2017

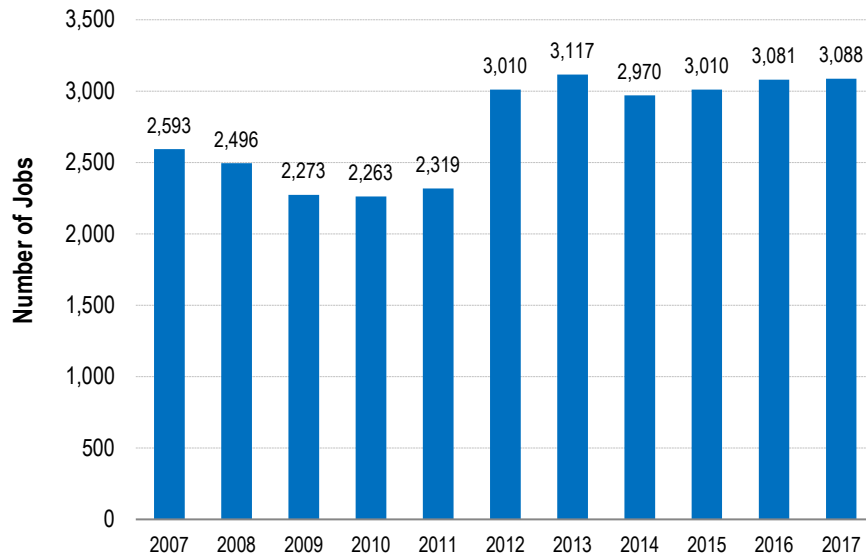
Sources: California Employment Development Department, 2007 - 2017; InfoGroup; & SCAG

- Construction jobs include those engaged in both residential and non-residential construction.
- Between 2007 and 2017, construction jobs in the city decreased by 71 percent.

Jobs in Retail Trade: 2007 - 2017

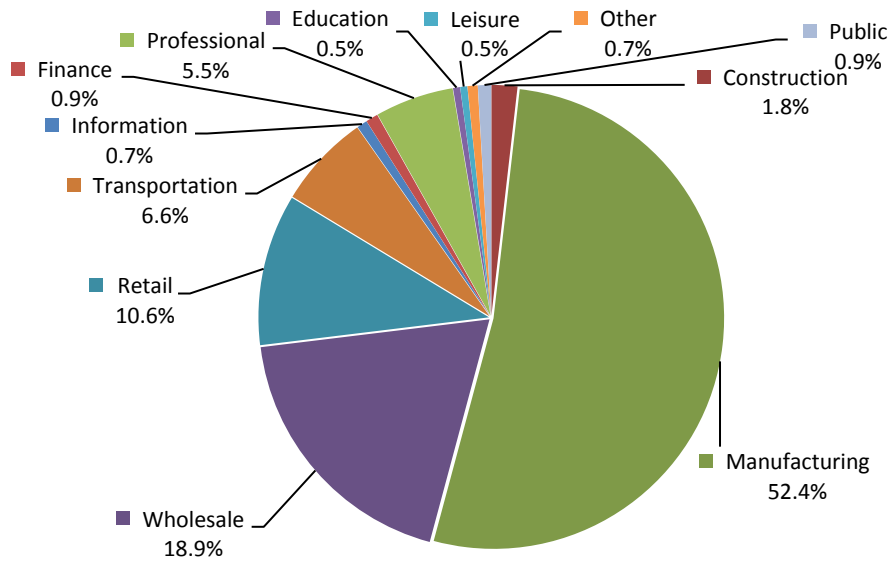
Sources: California Employment Development Department, 2007 - 2017; InfoGroup; & SCAG

- Retail trade jobs include those at various retailers including motor vehicle and parts dealers, furniture, electronics and appliances, building materials, food and beverage, clothing, sporting goods, books, and office supplies.
- Between 2007 and 2017, the number of retail trade jobs in the city increased by 71.5 percent.

Jobs in Professional and Management: 2007 - 2017

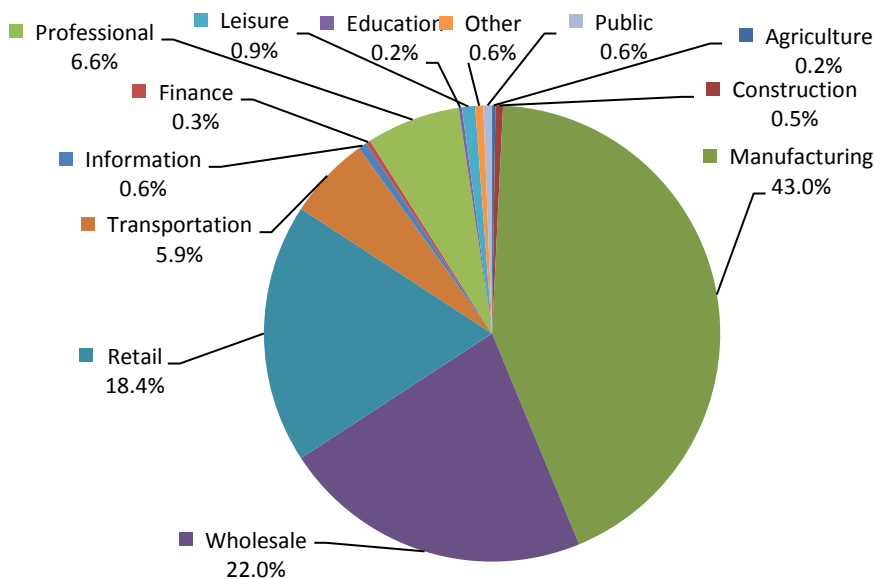
Sources: California Employment Development Department, 2007 - 2017; InfoGroup; & SCAG

- Jobs in the professional and management sector include those employed in professional and technical services, management of companies, and administration and support.
- Between 2007 and 2017, the number of professional and management jobs in the city increased by 19.1 percent.

Jobs by Sector: 2007

Sources: California Employment Development Department, 2007; InfoGroup; & SCAG

- From 2007 to 2017, the share of Retail jobs increased from 10.6 percent to 18.4 percent.
- See the Methodology section for industry sector definitions.

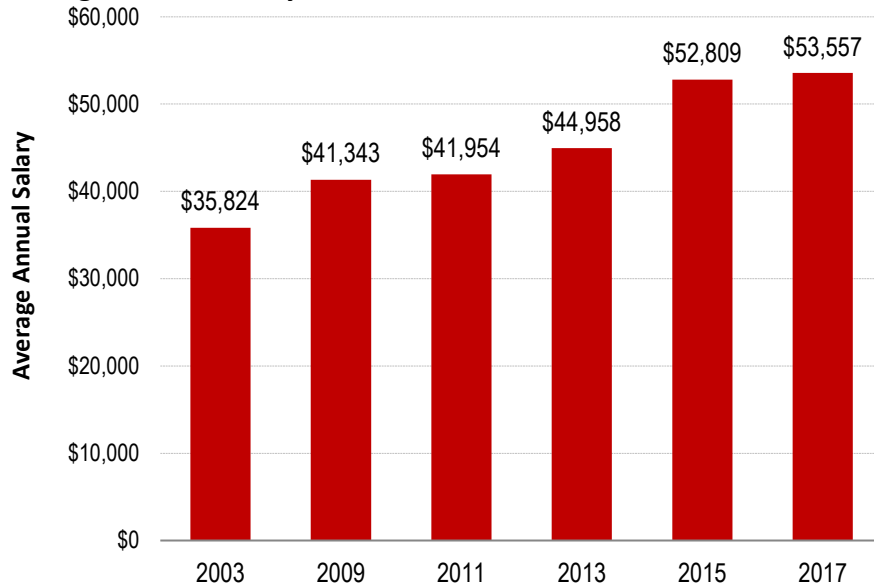
Jobs by Sector: 2017

Sources: California Employment Development Department, 2018; InfoGroup; & SCAG

- In 2017, the Manufacturing sector was the largest job sector, accounting for 43 percent of total jobs in the city.
- Other large sectors included Wholesale (22 percent), Retail (18.4 percent), and Professional (6.6 percent).

Average Salaries

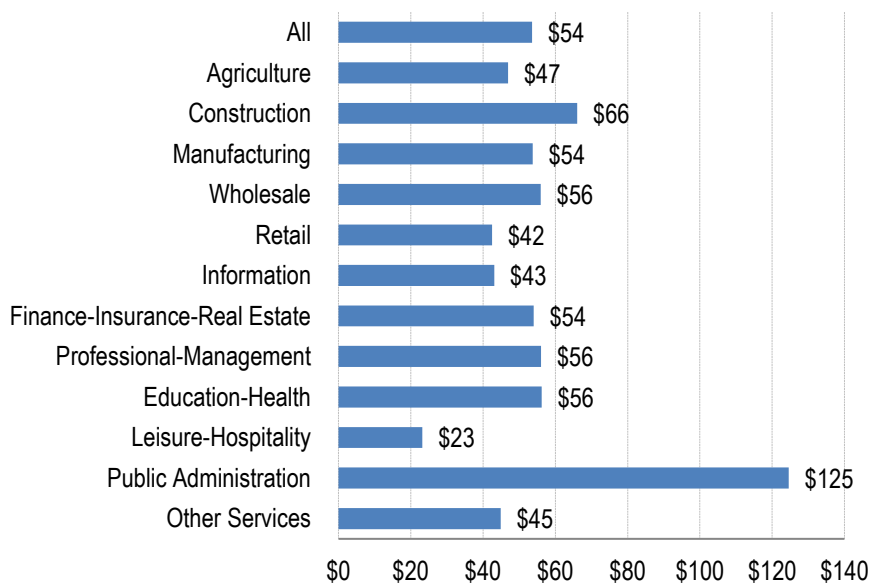
Average Annual Salary: 2003 - 2017



Source: California Employment Development Department, 2003 - 2017

- Average salaries for jobs located in the city increased from \$35,824 in 2003 to \$53,557 in 2017, a 49.5 percent change.
- Note: Dollars are not adjusted for annual inflation.

Average Annual Salary by Sector: 2017 (\$ thousands)



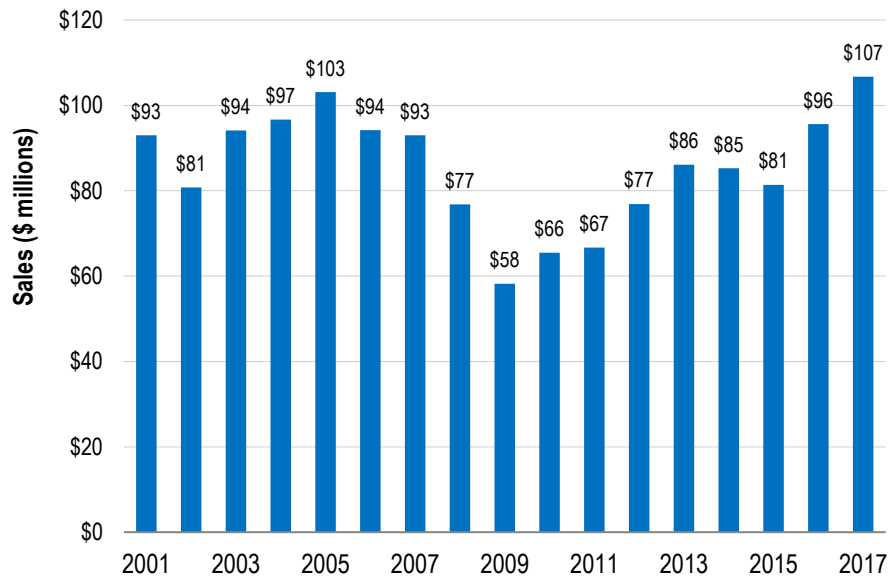
Source: California Employment Development Department, 2017

- In 2017, the employment sector providing the highest salary per job in the city was Public Administration (\$124,605).
- The Leisure-Hospitality sector provided the lowest annual salary per job (\$23,209).

VIII. RETAIL SALES

Real Retail Sales

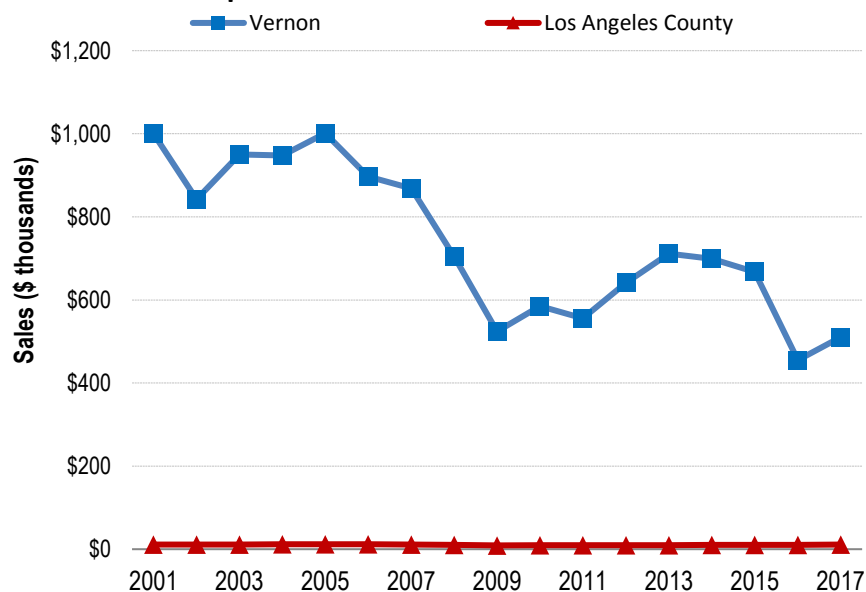
Real Retail Sales: 2001 - 2017



Source: California Board of Equalization, 2001-2017

- Real (inflation adjusted) retail sales in the City of Vernon was \$107 million in 2017.

Real Retail Sales per Person: 2001 - 2017



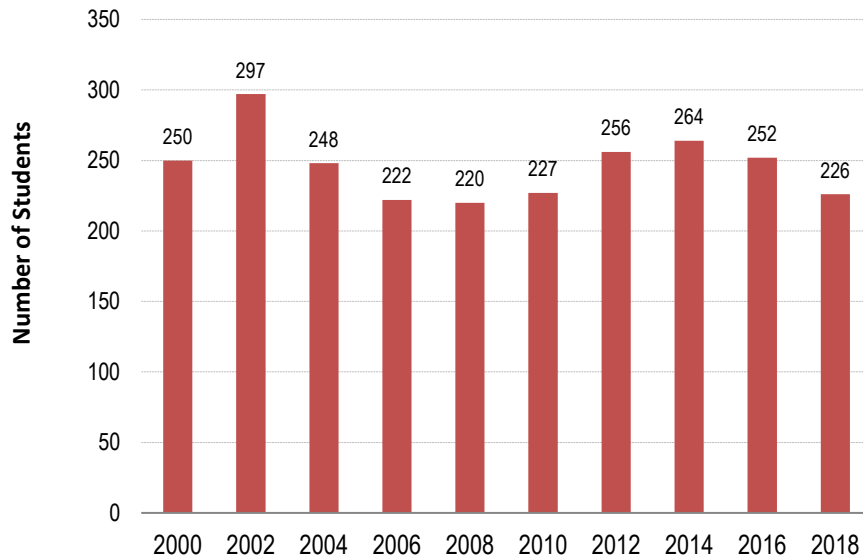
Source: California Board of Equalization, 2001-2017

- Real retail sales per person for the city was \$510.3 thousand in 2017.

IX. EDUCATION

Total Student Enrollment

K-12 Public School Student Enrollment: 2000 - 2018

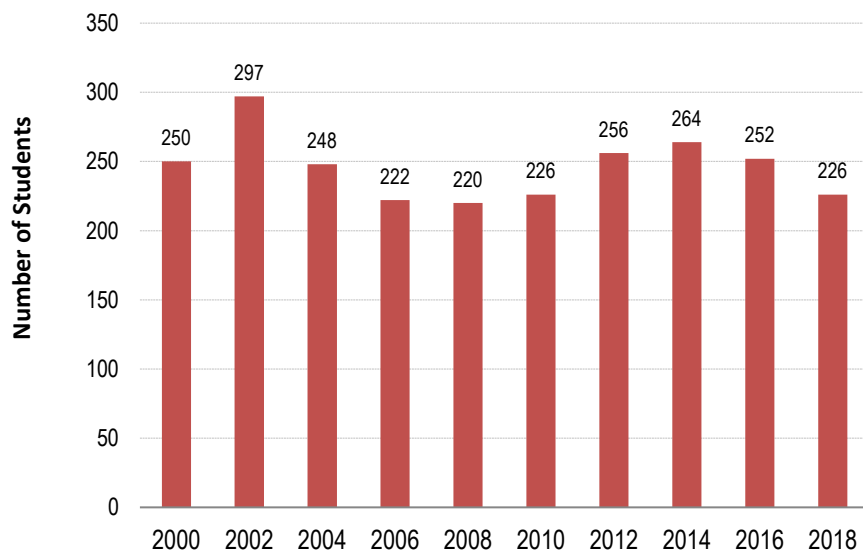


Source: California Department of Education, 2000 - 2018

- Between 2000 and 2018, total K-12 public school enrollment for schools within the City of Vernon decreased by 24 students, or about 9.6 percent.

Student Enrollment by Grade

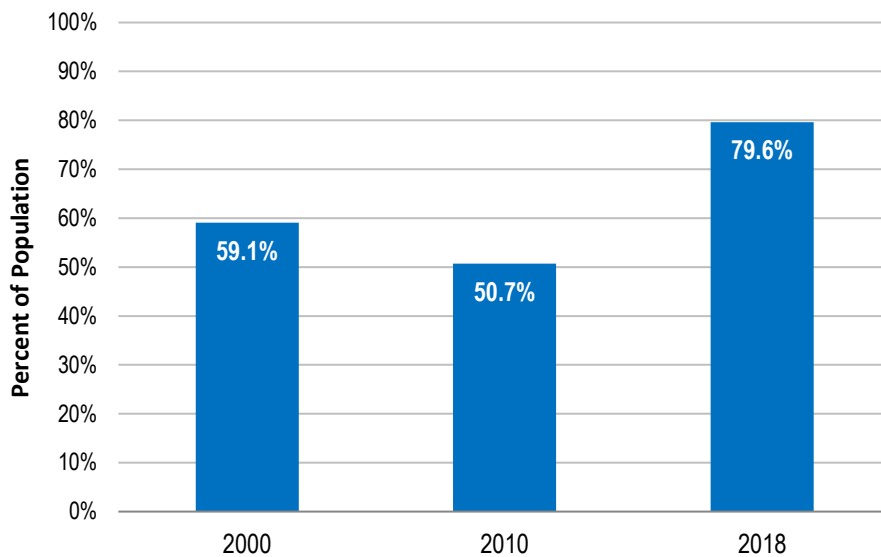
K-6 Public School Student Enrollment: 2000 - 2018



Source: California Department of Education, 2000 - 2018

- Between 2000 and 2018, total public elementary school enrollment decreased by 24 students or 9.6 percent.

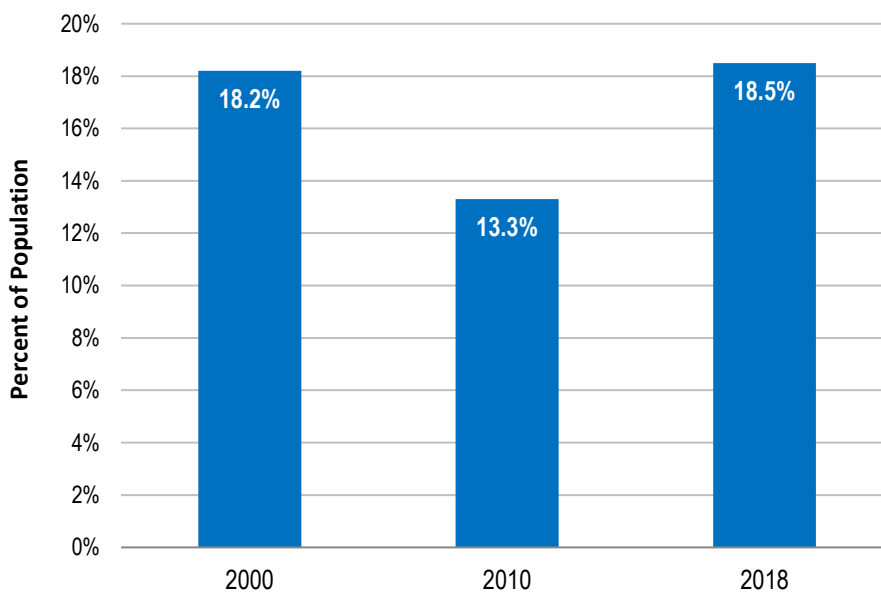
Percent of City Population Completing High School or Higher



Sources: 2000 & 2010 U.S. Decennial Census; American Community Survey, 2017; Nielsen Co.

- In 2018, 79.6 percent of the population 25 years old and over completed high school or higher, which is higher than the 2000 level.

Percent of City Population Completing a Bachelor's Degree or Higher



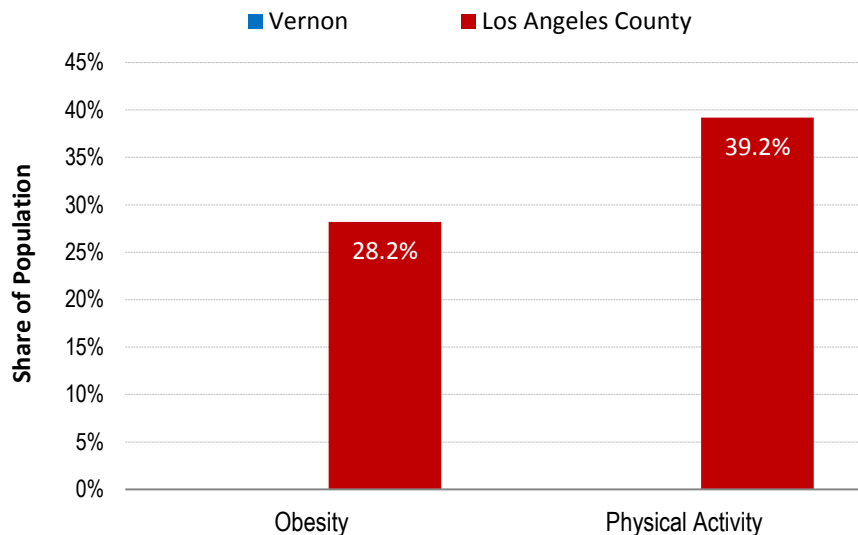
Sources: 2000 & 2010 U.S. Decennial Census; American Community Survey, 2017; Nielsen Co.

- In 2018, 18.5 percent of the population 25 years old and over completed a Bachelor's degree or higher, which is higher than the 2000 level.

X. PUBLIC HEALTH

Many adverse public health outcomes related to obesity and poor air quality may be preventable through the implementation of a more sustainable and integrated program of community and transportation planning at the regional and local levels. Evidence has shown that built environment factors play an important role in supporting healthy behavior and reducing rates of chronic diseases and obesity. For example, improved active transportation infrastructure, better accessibility to recreational open space, and the development of more walkable communities enhance opportunities for physical exercise and thereby result in a reduction of obesity rates, along with the chronic diseases associated with physical inactivity.

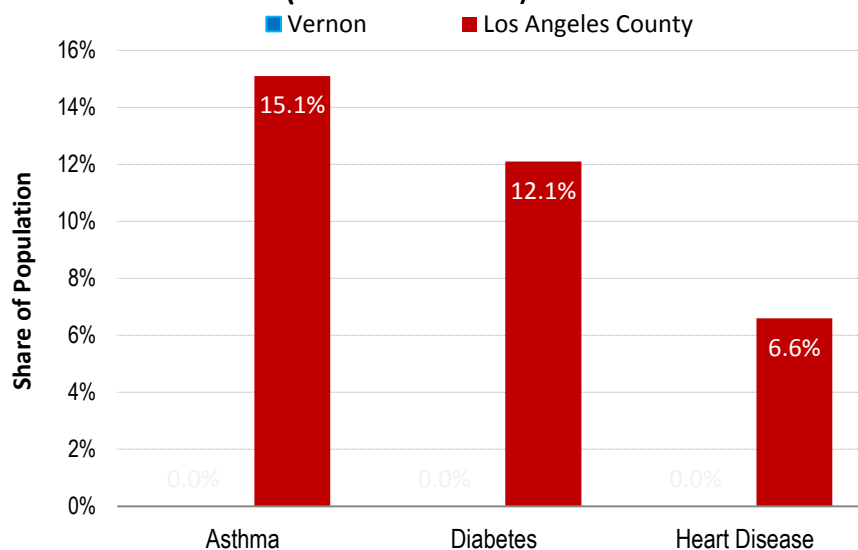
Obesity/Physical Activity Rates (18 Years & Older)



- Obesity rate data for the City of Vernon is not currently available.
- 'Obesity' is defined as a Body Mass Index (BMI) of 30 or higher.
- Physical Activity rate data for the City of Vernon is not currently available.

Source: California Health Interview Survey, 2018

Chronic Disease Rate (18 Years & Older)

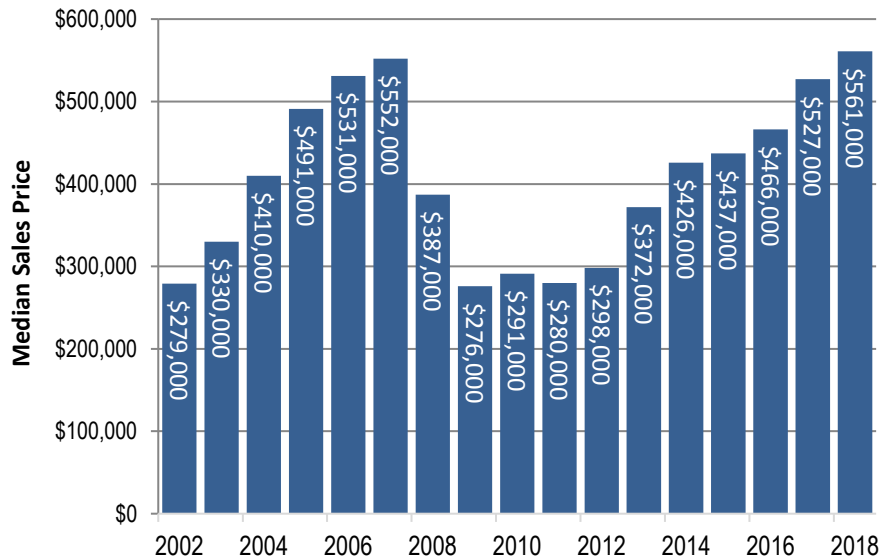


- Chronic disease rate data for the City of Vernon is not currently available.

Source: California Health Interview Survey, 2018

XI. SCAG REGIONAL HIGHLIGHTS

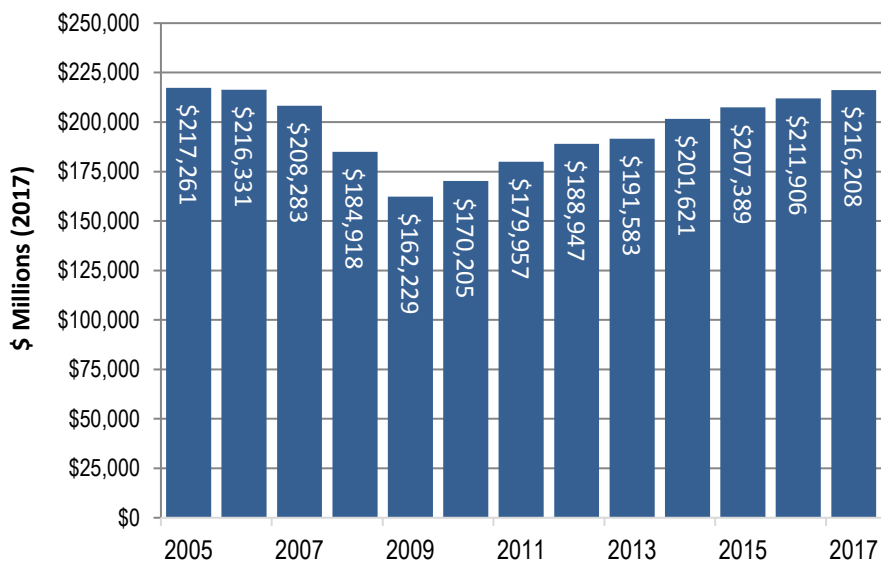
Regional Median Sales Price for Existing Homes: 2002 - 2018



Source: CoreLogic/DataQuick, 2002-2018

- After peaking in 2007, the median sales price for existing homes in the SCAG region dropped by half by 2009.
- By 2018, the median sales price had increased by more than 100 percent since 2009 to a new high of \$561,000.
- Median home sales price is calculated based on total existing home sales in the SCAG region.

Regional Retail Sales: 2007 - 2017



Source: California State Board of Equalization, 2007-2017

- Retail sales tend to follow regional trends in personal income, employment rates, and consumer confidence.
- Between 2005 and 2009, real (inflation adjusted) regional retail sales decreased by 25 percent.
- Total retail sales in the SCAG region increased by about 33 percent between 2009 and 2017.

XII. DATA SOURCES

California Department of Education

California Department of Finance, Demographic Research Unit

California Employment Development Department, Labor Market Information Division

California Health Interview Survey

California State Board of Equalization

Construction Industry Research Board

CoreLogic/DataQuick

InfoGroup

Nielsen Company

U.S. Census Bureau

XIII. METHODOLOGY

SCAG's Local Profiles utilize the most current information available from a number of public resources, including the U.S. Census Bureau, California Department of Finance, and the California Department of Education. In the event that public information is not available or is not the most recent, SCAG contracts with a number of private entities to obtain local and regional data. The following sections describe how each data source was compiled to produce the information displayed in this report.

Statistical Summary Table

In the Statistical Summary Table (page 3), the values in the field 'Jurisdiction Relative to County/Region' represent the difference between the jurisdiction's value and the county/region value, except for the following categories which represent the jurisdiction's value as a share of the county (or in the case of an entire county as a share of the region): Population, Number of Households, Number of Housing Units, Number of Jobs, Total Jobs Change, and K-12 Student Enrollment.

Median Age, Homeownership Rate, and Median Household Income values are based on data provided by the U.S. Census American Community Survey and the Nielsen Company. Number of Housing Units is based on the 2010 Census and estimates from the California Department of Finance. Data for all other categories are referenced throughout the report.

Population Section

Where referenced, data for 2000 through 2018 was obtained from the California Department of Finance E-5 estimates, which were published in May, 2018. This dataset is benchmarked to population data from the 2000 and 2010 U.S. Decennial Censuses. Data relating to population by age group and by race/ethnicity was obtained from the 2000 and 2010 U.S. Decennial Census, the American Community Survey, and the Nielsen Company. The 2000 value is based on U.S. Decennial Census data for April 1, 2000 and the 2010 value is based on U.S. Decennial Census data for April 1, 2010.

Below are definitions for race and ethnicity, as provided by the U.S. Census Bureau.

The 'Hispanic or Latino Origin' category refers to:

- Persons of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.

The 'Race' categories include:

- American Indian or Alaska Native: Persons having origins in any of the original peoples of North and South America (including Central America), and who maintain tribal affiliation or community attachment.
- Asian: Persons having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, Philippines, Thailand, and Vietnam.
- Black or African American: Persons having origins in any of the black racial groups of Africa, including those who consider themselves to be Haitian.

- White: Persons having origins in any of the original peoples of Europe, North Africa, or the Middle East.
- Some Other Race: This category includes Native Hawaiian or Other Pacific Islander (persons having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands) and all other responses not included in the 'American Indian or Alaska Native', 'Asian', 'Black or African American', or 'White' racial categories described above.

Charts for population based on age were tabulated using data from the 2000 and 2010 U.S. Decennial Census, the American Community Survey, and the Nielsen Company. Charts for race/ethnicity were tabulated using data from the 2000 and 2010 U.S. Decennial Census, the American Community Survey, and the Nielsen Company.

Households Section

Households refer to the number of occupied housing units. The 2000 value is based on U.S. Decennial Census data for April 1, 2000 and the 2010 value is based on U.S. Decennial Census data for April 1, 2010. Information for inter-census years was obtained through the U.S. Census American Community Survey and the Nielsen Company. Average household size was calculated using information provided by the California Department of Finance. Households by Size calculations are based on data provided by the American Community Survey and the Nielsen Company.

Housing Section

Housing units are the total number of both vacant and occupied units. Housing units by housing type information was developed using data from the California Department of Finance. Age of housing stock information is provided by the American Community Survey and the Nielsen Company.

The number of residential units with permits issued was obtained using Construction Industry Research Board data, which are collected by counties and are self-reported by individual jurisdictions. It represents both new single family and new multi-family housing units that were permitted to be built, along with building permits that were issued for improvements to existing residential structures. Please note that SCAG opted to report the annual number of permits issued by each jurisdiction which may be different than the number of housing units completed or constructed annually. This was done using a single data source which provides consistent data for all jurisdictions. The Construction Industry Research Board defines 'multi-family' housing to include duplexes, apartments, and condominiums in structures of more than one living unit.

Median home sales price data was compiled from information obtained from CoreLogic/DataQuick, and was calculated based on total resales of existing homes in the jurisdiction, including both single family homes and condominiums. The median home sales price does not reflect the entire universe of housing in the jurisdiction, only those units that were sold within the specified calendar year.

Housing Cost Share refers to the percentage of household income devoted to housing expenses. Housing cost share data for homeowners and renters is provided by the American Community Survey.

Transportation Section

The journey to work data for the year 2000 was obtained by using the 2000 U.S. Decennial Census Summary File 3. Data for 2010 is based on the 2010 U.S. Decennial Census. Information for inter-census years was obtained through the American Community Survey and the Nielsen Company.

Active Transportation Section

Data sources for county bike lane mileage by facility classification was provided by the six County Transportation Commissions in the SCAG region.

Employment Section

Data sources for estimating jurisdiction employment and wage information include the 2010 U.S. Census Bureau Local Employment Dynamics Survey, and information from the California Employment Development Department, InfoGroup, and SCAG for years 2007-2015. In many instances, employment totals from individual businesses were geocoded and aggregated to the jurisdictional level.

Employment information by industry type is defined by the North American Industry Classification System (NAICS). Although the NAICS provides a great level of detail on industry definitions for all types of businesses in North America, for the purposes of this report, this list of industries has been summarized into the following major areas: agriculture, construction, manufacturing, wholesale, retail, information, finance/insurance/ real estate, professional/management, education/health, leisure/hospitality, public administration, other services, and non-classified industries.

A brief description of each major industry area is provided below:

- **Agriculture:** Includes crop production, animal production and aquaculture, forestry and logging, fishing hunting and trapping, and support activities for agriculture and forestry.
- **Construction:** Includes activities involving the construction of buildings, heavy and civil engineering construction, and specialty trade contractors.
- **Manufacturing:** Includes the processing of raw material into products for trade, such as food manufacturing, apparel manufacturing, wood product manufacturing, petroleum and coal products, chemicals, plastics and rubber products, nonmetallic mineral products, and primary metal manufacturing.
- **Wholesale:** Includes activities in the trade of raw materials and durable goods.
- **Retail:** Includes activities engaged in the sale of durable goods directly to consumers.
- **Information:** Includes activities that specialize in the distribution of content through a means of sources, including newspaper, internet, periodicals, books, software, motion pictures, sound recording, radio and television broadcasting, cable or subscription programming, telecommunications, data processing/ hosting, and other information mediums.
- **Finance/Insurance/Real Estate:** Includes businesses associated with banking, consumer lending, credit intermediation, securities brokerage, commodities exchanges, health/life/medical/title/ property/casualty insurance agencies and brokerages, and real estate rental/leasing/sales.

- **Professional/Management:** Includes activities that specialize in professional/ scientific/technical services, management of companies and enterprises, and administrative and support services. Establishment types may include law offices, accounting services, architectural/engineering firms, specialized design services, computer systems design and related services, management consulting firms, scientific research and development services, advertising firms, office administrative services, and facilities support services.
- **Education/Health:** Organizations include elementary and secondary schools, junior colleges, universities, professional schools, technical and trade schools, medical offices, dental offices, outpatient care centers, medical and diagnostic laboratories, hospitals, nursing and residential care facilities, social assistance services, emergency relief services, vocational rehabilitation services, and child day care services.
- **Leisure/Hospitality:** Includes activities involved in the performing arts, spectator sports, museums, amusement/recreation, travel accommodations, and food and drink services.
- **Public Administration:** Includes public sector organizations, such as legislative bodies, public finance institutions, executive and legislative offices, courts, police services, parole offices, fire protection, correctional institutions, administration of governmental programs, research and technology, and national security.
- **Other Services:** Includes, for example, automotive repair and maintenance, personal and household goods repair and maintenance, personal laundry services, dry-cleaning and laundry services, religious services, social advocacy organizations, professional organizations, and private households.
- **Non-Classified:** All other work activities that are not included in the North American Industry Classification System.

Retail Sales Section

Retail sales data is obtained from the California Board of Equalization, which does not publish individual point-of-sale data. All data is adjusted for inflation.

Education Section

Student enrollment data is based on public school campuses that are located within each jurisdiction's respective boundary. Enrollment numbers by grade within a given jurisdiction are tabulated based upon data obtained from the California Department of Education. Enrollment year is based on the end date of the school year; for example, enrollment data for the year 2000 refers to the 1999-2000 school year. City boundaries used for all years is based on data provided by the Local Agency Formation Commission for each county in the region.

Public Health Section

Data sources for city and county obesity rates (share of population with a BMI of 30 or higher) and rates of physical activity (share of population that walked a minimum of 150 minutes each day) was obtained through the California Health Interview Survey (AskCHIS: Neighborhood Edition). Chronic disease incidence rates were also obtained through the California Health Interview Survey.

Regional Highlights

Information for this section was developed through data from CoreLogic/DataQuick and the California Board of Equalization.

Data Sources Section

In choosing data sources for use in this report, the following factors were considered:

- Availability for all jurisdictions in the SCAG region
- The most recognized source on the subject
- Data sources available within the public domain
- Data available on an annual basis

The same data sources are used for all Local Profiles (except where noted) to maintain overall reporting consistency. Jurisdictions are not constrained from using other data sources for their planning activities.

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XIV. ACKNOWLEDGMENTS

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Notes:



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Appendix G

Land Use Analysis

SCAG Land Use Analysis

Any parcels more than 50% contained within the City of Vernon Water Service Area boundary were considered serviced by the City.

The table that follows is a summary of all parcels that meet the above description organized by land use code. A description of the land use code follows the table.

LU Code	Land Use Description	Number of Parcels	Total Area (acres)
1110	Single Family Residential	90.00	13.23
1111	High-Density Single Family Residential	-	-
1112	Low-Density Single Family Residential	-	-
1120	Multi-Family Residential	44.00	27.21
1121	Mixed Multi-Family Residential	-	-
1122	Duplexes, Triplexes and 2- or 3-Unit Condominiums and Townhouses	-	-
1123	Low-Rise Apartments, Condominiums, and Townhouses	-	-
1124	Medium-Rise Apartments and Condominiums	-	-
1125	High-Rise Apartments and Condominiums	-	-
1130	Mobile Homes and Trailer Parks	-	-
1131	Trailer Parks and Mobile Home Courts, High-Density	-	-
1132	Mobile Home Courts and Subdivisions, Low-Density	-	-
1140	Mixed Residential	-	-
1100	Residential	-	-
1150	Rural Residential	-	-
1210	General Office Use	7.00	5.44
1211	Low- and Medium-Rise Major Office Use	-	-
1212	High-Rise Major Office Use	-	-
1213	Skyscrapers	-	-
1200	Commercial and Services	1.00	0.25
1220	Retail Stores and Commercial Services	88.00	89.61
1221	Regional Shopping Center	-	-
1222	Retail Centers (Non-Strip With Contiguous Interconnected Off-Street Parking)	-	-
1223	Retail Strip Development	-	-
1230	Other Commercial	-	-
1231	Commercial Storage	-	-
1232	Commercial Recreation	-	-
1233	Hotels and Motels	-	-
1240	Public Facilities	27.00	44.20
1241	Government Offices	2.00	8.81

LU Code	Land Use Description	Number of Parcels	Total Area (acres)
1242	Police and Sheriff Stations	-	-
1243	Fire Stations	-	-
1244	Major Medical Health Care Facilities	-	-
1245	Religious Facilities	-	-
1246	Other Public Facilities	-	-
1247	Public Parking Facilities	1.00	0.28
1250	Special Use Facilities	-	-
1251	Correctional Facilities	-	-
1252	Special Care Facilities	-	-
1253	Other Special Use Facilities	-	-
1260	Educational Institutions	-	-
1261	Pre-Schools/Day Care Centers	-	-
1262	Elementary Schools	-	-
1263	Junior or Intermediate High Schools	-	-
1264	Senior High Schools	-	-
1265	Colleges and Universities	-	-
1266	Trade Schools and Professional Training Facilities	-	-
1270	Military Installations	-	-
1271	Base (Built-up Area)	-	-
1272	Vacant Area	-	-
1273	Air Field	-	-
1274	Former Base (Built-up Area)	-	-
1275	Former Base Vacant Area	-	-
1276	Former Base Air Field	-	-
1300	Industrial	57.00	33.33
1310	Light Industrial	5.00	11.90
1311	Manufacturing, Assembly, and Industrial Services	279.00	146.71
1312	Motion Picture and Television Studio Lots	-	-
1313	Packing Houses and Grain Elevators	-	-
1314	Research and Development	-	-
1320	Heavy Industrial	644.00	1,045.87
1321	Manufacturing	5.00	4.24
1322	Petroleum Refining and Processing	-	-
1323	Open Storage	-	-
1324	Major Metal Processing	-	-
1325	Chemical Processing	-	-
1330	Extraction	-	-
1331	Mineral Extraction - Other Than Oil and Gas	-	-
1332	Mineral Extraction - Oil and Gas	-	-
1340	Wholesaling and Warehousing	434.00	863.56

LU Code	Land Use Description	Number of Parcels	Total Area (acres)
1400	Transportation, Communications, and Utilities	-	-
1410	Transportation	-	-
1411	Airports	379.00	504.49
1412	Railroads	1.00	3.37
1413	Freeways and Major Roads	-	-
1414	Park-and-Ride Lots	-	-
1415	Bus Terminals and Yards	-	-
1416	Truck Terminals	-	-
1417	Harbor Facilities	-	-
1418	Navigation Aids	-	-
1420	Communication Facilities	1.00	0.94
1430	Utility Facilities	-	-
1431	Electrical Power Facilities	7.00	95.43
1432	Solid Waste Disposal Facilities	-	-
1433	Liquid Waste Disposal Facilities	-	-
1434	Water Storage Facilities	-	-
1435	Natural Gas and Petroleum Facilities	-	-
1436	Water Transfer Facilities	-	-
1437	Improved Flood Waterways and Structures	5.00	4.13
1438	Mixed Utilities	-	-
1440	Maintenance Yards	-	-
1441	Bus Yards	-	-
1442	Rail Yards	-	-
1450	Mixed Transportation	7.00	8.52
1460	Mixed Transportation and Utility	-	-
1500	Mixed Commercial and Industrial	4.00	0.65
1600	Mixed Residential and Commercial	-	-
1800	Open Space and Recreation	-	-
1810	Golf Courses	-	-
1820	Local Parks and Recreation	-	-
1830	Regional Parks and Recreation	-	-
1840	Cemeteries	-	-
1850	Wildlife Preserves and Sanctuaries	-	-
1860	Specimen Gardens and Arboreta	-	-
1870	Beach Parks	-	-
1880	Other Open Space and Recreation	-	-
2000	Agriculture	5.00	7.95
2100	Cropland and Improved Pasture Land	-	-
2110	Irrigated Cropland and Improved Pasture Land	-	-
2120	Non-Irrigated Cropland and Improved Pasture Land	-	-

LU Code	Land Use Description	Number of Parcels	Total Area (acres)
2200	Orchards and Vineyards	-	-
2300	Nurseries	-	-
2400	Dairy, Intensive Livestock, and Associated Facilities	-	-
2500	Poultry Operations	-	-
2600	Other Agriculture	-	-
2700	Horse Ranches	-	-
3000	Vacant	-	-
3100	Vacant Undifferentiated	1.00	4.64
3200	Abandoned Orchards and Vineyards	-	-
3300	Vacant With Limited Improvements	-	-
3400	Beaches (Vacant)	-	-
1900	Urban Vacant	45.00	70.07
4000	Water	42.00	160.27
4100	Water, Undifferentiated	-	-
4200	Harbor Water Facilities	-	-
4300	Marina Water Facilities	-	-
4400	Water Within a Military Installation	-	-
4500	Area of Inundation (High Water)	-	-
1700	Under Construction	-	-
8888	Undevelopable or Protected Land	-	-
9999	Unknown	1.00	0.69

SOUTHERN CALIFORNIA 1990 AERIAL LAND USE STUDY

LAND USE CODE DESCRIPTIONS AND KEY SIGNATURES Level III/IV

The land use definitions and descriptions were developed by Aerial Information Systems, Inc. as a Modified Anderson Land Use Classification. This classification uses a hierarchical system, allowing easy aggregation and disaggregation of classes. Most uses in the 1990 Land Use Study of Southern California were mapped to the fourth level. The user may elect to use the second or third level, or any variation, in analyses or display. The descriptions below apply to land use characteristics in southern California, and may not apply to other geographic areas. Key signatures are described using natural color aerial photography.

1000 URBAN OR BUILT-UP

Areas of built-up land characterized by intensive land use, where most of the land is covered by man-made structures because of human activity.

1100 RESIDENTIAL

The residential category includes areas of single family residences, multi unit dwellings, and mobile homes. Also included is a mixed residential category that consists of two or more of the aforementioned groups. The units/acre listed can be used as an indicator of relative density to aid in analysis when using the land use study.

1110 SINGLE FAMILY RESIDENTIAL

These residential areas are typically made up of detached dwellings, where each structure houses a single family, located in an urban or suburban setting. (Single family residential units located in a rural setting are classified as code 1151 or code 1152 under Rural Residential.) These single family residences are usually served by all utilities, are on paved streets, and are provided with or have access to all urban facilities such as schools, parks, police, and fire stations.

Single family residential neighborhoods are normally large contiguous areas of residential lots. Some areas have subdivisions or tracts of homes with similar size or architectural design. In these areas the roofs may be similar in shape or color when viewed on the aerial photo. Typically, single family lots contain landscaped front and back yards, one driveway, and one walkway either to the sidewalk or to the driveway. The house usually contains one chimney, and one air-conditioning unit. Some lots may have swimming pools in the back yards. High or low density is determined by the size of the lot on which the residence is located. If an area is under construction, and the residential lots or pads are easily identifiable, then the unit may be coded with the appropriate density category.

1111 High Density Single Family Residential

This category contains single family detached residential units with a unit density of >2 units/acre. These units are typically found in modern urban and suburban subdivisions.

1112 Low Density Single Family Residential

This category contains single family detached residential units with a unit density of <2 units/acre. These units may include areas of urban ranch homes or estates. Also included are urban areas where single family lots have been established but houses have not been built on all of them and are not likely to be built in the near future. The homes are spaced at a density of <2 units/acre. In some situations, a low density area may be rural in appearance because it was once a rural area but is now within the urban setting or a transitional area.

1120 MULTI-FAMILY RESIDENTIAL

Multi-family units are attached residences, apartments, condominiums, and townhouses. Multi-family residences are usually served by all utilities, are on paved streets, and are provided with or have access to all urban facilities such as schools, parks, police and fire stations. Senior citizen apartment buildings are included in these classes. Also included are off-campus university owned housing and off-campus fraternity/sorority houses.

1121 Mixed Multi-Family Residential

This category is used when there is a mixture of multi-family uses (duplexes, triplexes, apartments, condominiums, and/or townhouses of any type), none of which is over 2.5 acres in size, and no one type dominates. This situation may occur in older neighborhoods.

1122 Duplexes, Triplexes, and 2- or 3-Unit Condominiums and Townhouses

This category is composed of duplexes, triplexes, and 2- or 3-unit condominiums and townhouses that are attached multi-family structures.

Duplex and triplex residences may occur together or mixed with single family houses in some older neighborhoods (see code 1121 and 1140). Typically the multi-unit structure is one story located on a lot approximately the same size as nearby single family residential lots. There may be minimal landscaping or yard space. On the aerial photo, one may be able to count the driveways, sidewalks, entryway overhangs, chimneys, or air conditioning units corresponding to the number of units in the structure. Some newer duplexes and triplexes occur as 2- or 3-unit structures in complexes as condominiums and townhouses, with common grounds.

1123 Low-Rise Apartments, Condominiums, and Townhouses

This category includes multi-family structures of one to two stories and approximately 10 to 18 units/acre. The area consists of either a large single structure or a group of structures, of four or more units each, in a complex with associated common grounds, facilities and parking areas.

Typically low-rise apartments, condominiums, and townhouses occur together in large contiguous areas since land use is restricted to multi-family zoned areas. However, in some areas one to a few buildings may occur on individual lots in single family residential neighborhoods. In newer neighborhoods they may appear as a large complex composed of many structures of similar architecture with common grounds and facilities. Some older structures are U-shaped or O-shaped with a swimming pool in the middle. A parking level may be located underneath the living area, in which case it is not counted as a story. Parking for larger complexes may include garages or carports along the periphery of the complex. Low-rise apartments and condominiums are the most common types of multi-family structures in the study area. Also included are off-campus fraternity/sorority houses and senior citizen apartments. Residential units located above first floor commercial in buildings along a commercial strip are considered commercial use (1223, 1224). An area mapped as Low-Rise Apartments, Condominiums, and Townhouses may contain an occasional Medium-Rise building.

1124 Medium-Rise Apartments and Condominiums

This category includes multi-family structures of three to four stories and >18 units/acre. The area consists of a large single structure or a group of structures, of four or more units each, in a complex with associated common grounds, facilities and parking areas.

Many medium-rise apartments and condominiums occur in older areas as hotel/apartments. Several may be located next to each other in compact areas. Some may occur as large complexes, composed of many structures of similar architecture, with common grounds and facilities. Medium-rise apartments and condominiums are not as common as low-rise. Senior citizen apartments are included. If an area contains commercial use on the first floor and multi-family residential use on the upper floors, then the area is considered strip commercial (codes 1223, 1224). Some older urban core cities contain apartment and condominium buildings predominantly of three, four, or more stories. An area mapped as Medium-Rise may contain occasional Low-Rise or High-Rise buildings. Use of stereoscopic viewing of aerial photos is essential in determining relative height in relation to other structures in the area.

1125 High-Rise Apartments and Condominiums

This category includes multi-family structures of five stories or greater and >18 units/acre. The area consists of either a single large structure or a group of adjacent structures with common grounds, facilities

and parking areas.

Many high-rise apartments and condominiums occur as single or groups of high residential towers. Parking may be underground or in an adjacent parking structure. Smaller high-rise structures may contain only residential units with no other uses. High-rise residential structures are configured to maximize availability of window access to each individual residential unit. Thus the building may be long and narrow, or contain narrow lateral wings that provide window access. Senior citizen apartments are included. If an area contains commercial use on the first floor and multi-family residential use on the upper floors, then it is considered High-Rise Apartments and Condominiums.

1130 MOBILE HOMES AND TRAILER PARKS

These residential units are composed of mobile homes, trailers and pre-fabricated housing that are either stationary with foundations or that is on wheels and capable of being moved. Included are vacant and occupied spaces, and associated storage facilities for the complex. Mobile homes and trailer parks are usually served by all utilities, are on paved streets, and are provided with or have access to all urban facilities, such as schools, parks, police, and fire stations. This category does not include transient facilities such as recreational vehicle parks or campgrounds (see code 1880).

Mobile homes are typically long, narrow, and rectangular in shape. Most have a white signature when represented on an aerial photo, although some modern mobile homes may have a less reflective or colored roofing material. Some newer modular home or mobile home courts and subdivisions contain homes with false facades, giving the impression of an apartment or condominium complex, or single family houses.

1131 Trailer Parks and Mobile Home Courts, High Density

This category includes typical mobile home or trailer parks and pre-fabricated homes (>6 units per acre) that are in a contiguous area with trailer or mobile home spaces and associated facilities.

Trailer courts and mobile home parks normally have a high, closely spaced density of units within the lot with very limited landscaping. The mobile homes are parked side by side in parallel rows with an access drive along the front of the row. Also included are associated recreational vehicle storage lots within or next to the mobile home park.

1132 Mobile Home Courts and Subdivisions, Low Density

This category includes typical mobile and pre-fabricated homes located in lower density mobile home park or in a single family residential subdivision pattern on curbed named streets (<6 units per acre).

Individual mobile homes appear as in the description above (1131), although there may be additional architectural modification associated with it. Units are more widely spaced, with landscaping as in front and back yard areas of a normal subdivision. Each lot has its own driveway or walkway, similar to single family residential areas. Also included are associated recreational vehicle storage lots within or next to the mobile home park.

1140 MIXED RESIDENTIAL

1140 Mixed Residential

This category includes areas where there is a combination of single family detached and multi-family dwellings of any type occurring together. Each individual residential type does not meet the 2.5-acre minimum mapping resolution and neither dominates. Typically these are located in older neighborhoods, where duplexes, triplexes, and apartment buildings occur among single family houses.

1150 RURAL RESIDENTIAL

Rural Residential units include ranches, farmsteads, single mobile homes, and residences located in a rural setting. Typically these areas have limited urban services.

1151 Rural Residential High Density

This category is composed of a group of homes in a rural setting at a density of >2 units/acre. Units may contain backyard animal shelters or pens for non-commercial livestock. This class does not include commercial agricultural land, but does include backyard non-commercial agricultural activity, including field crops, groves, horse facilities, barns, and other agricultural uses. Backyard agricultural is mapped as part of the 1151 polygon.

1152 Rural Residential Low Density

This category includes homes located in a rural setting at a density of <2 units/acre. Included are backyard animal shelters or pens for non-commercial livestock. This class does not include commercial agricultural land, but does include backyard non-commercial agricultural type activity including improved pastureland, field crops, groves, horse facilities, barns, and other agricultural uses. If the backlot agricultural use meets the MMU (2.5 acres), it will be mapped as a separate polygon and coded with the appropriate land use class.

1200 COMMERCIAL AND SERVICES

Commercial and Services includes areas used predominantly for business or the sale of products and their associated services. Also included are some non-commercial uses such as government and public service offices.

This class does not include industrial activities.

1210 GENERAL OFFICE USE

Included are areas of office buildings usually used for financial, personnel, business, medical and other professional services. The unit includes associated facilities and parking areas.

1211 Low- to Medium-Rise Major Office Use

This category includes office buildings of one to ten stories in height.

Office buildings are usually located on or adjacent to major streets, depending on the need for high visibility. Offices have parking areas either behind or around the buildings. Typically there are two styles of building structures. Normally, the low-rise office buildings (one to four stories in height) try to maximize window access, resulting in buildings that are long and narrow, containing a central courtyard, or have lateral wings. Medium-rise office buildings (five to ten stories in height) tend to be square, or rectangular in shape. Landscaping can vary from minimal to extensive, although modern larger office buildings do have considerable surrounding landscaped areas. Utility administrative offices are included in this category. Some corporate or business parks may be entirely made up of, or predominantly contain office space, although they may be similar to light industrial complexes (1311) or mixed commercial and industrial complexes (1500).

If an area contains commercial strip use on the first floor and offices on the upper floors (3 - 10 stories), then the area is considered Low- to Medium-Rise Major Office Use. A commercial strip of two-story structures containing offices on the upper floors is considered strip commercial (1223, 1224).

1212 High-Rise Major Office Use

This category includes office buildings that are eleven to forty stories in height.

The characteristics of the smaller high-rise office buildings are similar to medium-rise office buildings as described above. The taller office buildings are typically rectangular, with no particular regard for window accessibility. Older office buildings may be located side by side with retail commercial on the first floor. Modern suburban office buildings may have their own parking areas or landscaped surroundings. Many taller office buildings will have underground parking, or parking on the first few levels.

1213 Skyscrapers

This category includes office buildings greater than forty stories in height.

Skyscrapers are the tallest buildings built, normally occurring in downtown areas of larger cities, although they can also be located in business districts not associated with a downtown area. Retail commercial use usually occurs on the ground floor, with office use on the upper floors. Their relative height compared to surrounding areas is evident when the photos are viewed in stereo. Parking may be underground, on the first few levels, or in adjacent parking structures.

1220 RETAIL STORES AND COMMERCIAL SERVICES

Areas composed primarily of retail stores, restaurants, offices, and personal services, including associated facilities and parking areas.

1221 Regional Shopping Center

This category includes large retail centers composed of one or more major department stores and a full range of smaller shops, restaurants, offices and commercial services.

Most regional centers are enclosed malls, which are typically one to three stories in height, elongate in shape, with large square protrusions formed by the large department stores, the areas between being the smaller retail stores, services, and restaurants. Usually parking areas totally surround the building, some of which may be parking structures. Businesses located within the contiguous parking area are included with the regional shopping center. In urban areas, where open space may be limited, the mall building may be located over an entire block, with parking underground, and no visible surface parking. Factory outlet centers are included in this category.

1222 Retail Centers (Non-Strip with Contiguous Interconnected Off-Street Parking)

This category includes a large magnet store, with smaller retail stores, restaurants, service shops, and offices located in shopping centers with contiguous interconnected off-street parking. These centers are normally located along major highways and traffic corridors to take advantage of the increased customer exposure. Included are gasoline stations, restaurants and other stores whose parking area is contiguous with the center. Included are some grocery store, drug store, and department store shopping centers.

Retail or shopping centers contain buildings that are typically rectangular in shape with some architectural protrusions spaced at intervals when viewed on an aerial photo. The smaller stores are housed in long, narrow portions of the building, the larger stores are in the larger square portions. The building is usually situated toward the rear of the lot, with parking on the street side. There may be smaller commercial buildings within the parking area. Usually there is minimal to no landscaping.

Also included in this category are thematic commercial centers that function as a tourist attraction with specialty shops and restaurants.

1223 Modern Strip Development

This category includes retail stores, restaurants, service shops, and offices aligned along major highways and traffic corridors to take advantage of the increased customer exposure. Included are gasoline stations, auto repair shops, convenience stores, liquor stores, small bank branch offices, clothing stores, restaurants, furniture stores, discount stores, novelty stores, car dealerships or auto centers, drug stores, small corner markets, auctions, and mini-malls. In addition to on-street parking, there is easy access to off-street parking areas, that can be found in the front, on the side, as well as behind the commercial establishments. This category includes most newer style business corridors built since the 1950's.

Included are modern commercial corridors, usually containing a mixture of commercial uses along major highways. Some lots contain one building toward the back of the lot with no major store, and a small parking lot on the street side. Strip Development areas are typically located on major streets to take advantage of the high visibility. Usually there is minimal to no landscaping. Mini-malls are similar to shopping centers except they contain no large or magnet store. In two- or three-story structures, if offices or apartments are located over first floor commercial in a commercial strip, then the site is considered strip commercial also. Older style strip development areas are included in class 1224.

1224 Older Strip Development

This category includes strip development areas of little or no parking, such as the older business districts of small suburban cities. Any available parking is normally on the street, or in non-attended public parking areas. This category includes most older style business corridors built prior to the 1960's.

Older strip development areas contain storefronts and restaurants that directly abut the street or sidewalk, with very limited parking on the street or in back. Commercial units are positioned one immediately adjacent to another along the street. The strip development is composed mostly of specialty stores, offices, service shops, and restaurants. Adjacent parking areas that are less than the 2.5-acre minimum mapping resolution are included. In two- or three-story structures, if offices or apartments are located over first floor commercial in a commercial strip, then the site is considered strip commercial also. Adjacent non-attended public parking areas that are greater than 2.5 acres are mapped as class 1247.

1230 OTHER COMMERCIAL

Commercial uses other than general office, typical retail stores, and/or personal services. Included in this category are associated facilities and parking areas.

1231 Commercial Storage

This category includes public mini storage unit facilities and small commercial storage yards. This class does not include large storage warehouses (see code 1340).

Mini storage facilities are normally composed of a series of long, narrow parallel rectangular buildings, sometimes encompassed by a U-shaped or L-shaped building. Also included in this category are RV or large vehicle storage lots which, in some cases, are adjacent to mini storage unit facilities.

1232 Commercial Recreation

This category includes areas of commercial recreational use, such as sports stadiums (not associated with schools), car and horse race tracks, indoor shooting ranges, amusement parks, fairgrounds, gambling facilities (card halls and Indian bingo), and movie theaters (all drive-in and some walk-in types). Zoos are not included in this class, but are mapped as class 1850.

School sports facilities are mapped with the appropriate school category (e.g. a high school track would be called "High School"). Race tracks in this category do not include isolated or rural horse exercise or training tracks (see code 2700). Drive-in theaters are pie slice-shaped areas with concentric arcs within, as seen on aerial photos. Other examples include walk-in theaters not located in a mall or retail center, bowling alleys, ice and roller skating rinks, miniature golf courses, and small amusement facilities. Facilities such as bowling alleys and skating rinks may need to be verified and coded in the field since, on the photo, they resemble other types of land uses. Some categories, such as race tracks, some amusement parks, and fairgrounds, may already be identified on the collateral maps.

1233 Hotels and Motels

This category includes all major hotels and motels. Small or inactive motels which may be less than 2.5 acres may be classified as strip commercial. Large hotels usually contain varied commercial activity on-site (e.g. restaurant, barber/beauty salons, bar, gift shops, etc.). Motels, however, tend to be limited to an office and individual units.

Hotels, motels, suites, inns, and motor lodges tend to be located along major transportation corridors, near airports, large amusement parks, convention centers, civic centers, and/or downtown areas to take advantage of the potential market of transient overnight or extended-stay travellers. Smaller facilities normally contain a series of one- or two-story buildings with parking within the complex, or surrounding the buildings. Landscaping may be minimal. Usually there is a swimming pool toward the front or middle of the lot. Restaurants and gas stations are located in the immediate area. Large hotels tend to be

greater than three stories in height. In order to maximize window access the building configurations are long and narrow in shape, or contain narrow lateral wings. Parking may be underground, in parking structures, or in open areas around the hotel complex. Older hotels and motel may be located along what once was a major transportation corridor, but the major corridor has since been moved to a freeway in another location.

1234 Attended Pay Public Parking Facilities

This category includes stand alone public parking areas and parking structures that have an attendant-cashier present, and is not associated with another use.

Collateral data is required to map attended pay public parking areas. Parking structures will appear as a multi-story structure when the photos are viewed in stereo. Other areas appear as open ground level parking areas. Heavily commercial or downtown areas typically contain pay parking facilities, especially in the larger city core areas.

1240 PUBLIC FACILITIES

Public Facilities include government offices and other public service facilities, major health care facilities, religious facilities, and public and private educational facilities. This class also includes associated facilities and parking areas. Collateral data aids in the identification of these facilities.

1241 Government Offices

This category includes federal, state, regional, county or municipal administrative office buildings. Also included in this category are post offices, courthouses, and school district offices.

The aerial photo signature will appear similar to Commercial General Office Use (see code 1211). In the suburban areas the offices will usually be one to two stories in height, with landscaping and parking.

1242 Police and Sheriff Stations**

This category includes all municipal, county sheriff, and state highway patrol police stations. Police stations in a military installation are not included.

Collateral data is required to map these facilities. Normally these facilities are below the 2.5-acre minimum mapping resolution. As a critical land use, these facilities will be mapped at a minimum as a one acre polygon so that they can be included in this data base.

1243 Fire Stations**

This category includes all state, county and municipal fire stations. Seasonal fire stations are also included. Fire stations in a military installation are not included.

Collateral data is required to map these facilities. Normally these facilities are below the 2.5-acre minimum mapping resolution. As a critical land use, these facilities will be mapped at a minimum as a one acre polygon so that they can be included in this data base.

1244 Major Medical Health Care Facilities

This category includes public and private general medical health care facilities (hospitals) that give short-term care.

Larger hospitals are normally multi-storied, with split-level recessed/tiered upper floors that may form long and narrow lateral wings in order to maximize availability of window access for patient rooms. The area may contain other associated buildings, parking structures, parking areas, and landscaping. Smaller hospitals are one to two stories in height, with parking areas and landscaping. In both cases there may be circular drives with covered main entrances. Some facilities contain a number of buildings forming a complex. Medical offices are often located in close proximity to medical health care facilities. Some medical school facilities may be included as part of a major medical health care facility complex.

1245 Religious Facilities

This category includes churches, mosques, synagogues, temples, tabernacles, and other places of worship or religious pursuit. Religious monasteries, convents, etc. are also included in this category. Not included are schools (see 1262 through 1264), communication (see code 1420) and mass media facilities (see code 1211 and 1212) associated with a religious denomination.

Worship facilities are normally below the 2.5-acre minimum mapping resolution. They appear as one main building with landscaping and parking areas. Some facilities have a grass play area, or other smaller buildings. Monasteries and convents may appear as large office-type or apartment-type buildings in a closed compound with parking areas and substantial landscaping. Religious facilities may be identified on the topographic base maps, but that source may not be current. Small cemeteries, less than 2.5 acres, that are associated with an adjacent church are included with the church. Religious camps are mapped as code 1880. Retreat or conference centers are mapped as code 1253.

1246 Other Public Facilities

This category includes convention centers, and other public facilities, such as libraries, community centers, auditoriums, live indoor and outdoor theater facilities, observatories and museums, which are not

covered by other categories.

Convention centers may appear as very large rectangular to square building complexes with some architectural design. There is much landscaping and surface parking, parking structures, or underground parking. Convention centers are usually located in downtown civic center areas, central business districts, or near major airports.

Many public facilities in this category resemble office buildings in appearance. Outdoor theaters appear as large amphitheater areas with concentric seating pattern. Libraries, auditoriums, observatories, museums, and community centers are usually identified on collateral sources.

1247 Non-Attended Public Parking Facilities

This category includes free or metered public parking areas where no attendant-cashier is present. Only parking facilities greater than the 2.5-acre minimum mapping resolution are included. Facilities smaller than minimum mapping resolution are mapped with the adjacent use.

Most non-attended public parking facilities occur in older strip development areas (code 1224). Most of these parking facilities are located in the central business districts of suburban cities or community centers. The parking facility is usually located behind or across the street from the old commercial strip.

1250 SPECIAL USE FACILITIES

Special Use Facilities include institutional type facilities such as correctional institutions, mental health institutions, convalescent health care facilities, non-profit institutions, and fraternal organizations.

1251 Correctional Facilities

This category includes large facilities providing institutional services, such as juvenile halls, youth correctional facilities, county jailhouses, federal and state prisons, and state correctional mental hospitals (also see code 1252).

These institutions may be several acres in size, with many "office-type" or "apartment-type" buildings, landscaping, and parking areas, all confined to a closed complex. Other uses, such as agriculture, occurring within the correctional facility grounds are mapped separately.

1252 Special Care Facilities

This category includes public and private institutional care, such as convalescent and rehabilitation facilities, nursing homes, mental health facilities, sanitariums and state non-correctional mental hospitals.

Also included are reform schools, orphanages, and homes for abused, neglected, or other special needs children. This class does not include senior citizen apartments (see codes 1121, 1122, 1123, 1124, and 1125).

Larger facilities are normally multi-storied, with split level recess-tiered upper floors that may form long and narrow lateral wings in order to maximize availability of window access for patient or resident rooms. The area may contain other associated buildings, parking structures, parking areas, and landscaping. Smaller facilities are one to two stories in height, with parking areas and landscaping. In both cases there may be circular drives with covered main entrances. Residential and mental health facilities may contain "office-type" or "apartment-type" buildings, landscaping, and parking areas in a closed complex.

1253 Other Special Use Facilities

This category includes fraternal and other non-profit organizations, such as Salvation Army, Goodwill Industries, YMCA, youth organizations, homeless shelters, etc. Also included are retreat or conference centers.

This category includes a wide range of photo signatures. Many of the facilities in this category are similar to office buildings in appearance. Some may occur in retail commercial areas. Some fraternal organizations, however, may take on the appearance of churches or other religious facilities. YMCA and YWCA facilities may contain recreational facilities such as swimming pools, gymnasiums, baseball fields, etc. Some facilities may appear in industrial areas, such as Goodwill Industries.

1260 EDUCATIONAL INSTITUTIONS

All levels of public and private schools, colleges, universities, seminaries, and training centers are covered by this category. Includes buildings, open space, dormitories, and parking areas. Also included are all athletic facilities, such as ball fields, stadiums, soccer fields, swimming pools, and tennis courts.

1261 Pre-Schools/Day Care Centers

This category includes public and private pre-schools, nursery schools, and day care centers. Facilities associated with other educational institutions or religious facilities are not included in this category.

Most pre-schools/day care centers are below the 2.5-acre minimum mapping resolution. Typically, pre-schools and day care centers are located in commercial areas within close proximity to residential neighborhoods. The facility can appear similar to any commercial type use, however, it will usually contain playground equipment within a fenced lot.

1262 Elementary Schools**

This category includes public and private schools, kindergarten through sixth grade, kindergarten through eighth grade, or other beginning grade levels, depending on local school board or administration policy.

Normally buildings are one or two stories in height, though some higher storied buildings may be present. The area contains landscaping and walkways. Buildings are either long and rectangular or have long narrow wings to maximize availability of window access. The play area can be a gray photo signature of asphalt, or a green signature of grass, or both. Elementary schools are usually much smaller than the other types of schools, normally less than 10 acres in size. The parking lot is very small, and may contain a bus loading curb or area. Because this class is a critical land use, any schools that are below the 2.5-acre minimum mapping resolution will be mapped at their actual size, or at a one-acre minimum. If a school serves a narrower or wider range of grade levels, then the school is assigned the class that the facility typically resembles.

1263 Junior High Schools**

This category includes public and private schools for grades seven through eight, seven through nine, or other intermediate grade levels, depending on local school board or administration policy. Intermediate and Middle Schools may be included in this category.

Normally buildings are one or two stories in height, though some higher storied buildings may be present. The area contains landscaping and walkways. The buildings are either long and rectangular or have long narrow wings to maximize availability of window access. The athletic area may have a gray photo signature representing asphalt and a larger area of grass which is used as the soccer field/baseball diamond/track. Some schools will have a swimming pool or tennis courts. A parking lot with bus loading curb area may be visible. Junior high schools appear similar to high schools, but have smaller parking and athletic facilities. A junior high school lot is normally about 10 to 20 acres in size. Because this class is a critical land use, any schools that are below the 2.5-acre minimum mapping resolution will be mapped at their actual size or at a one acre minimum. If a school serves a narrower or wider range of grade levels, then the school is assigned the class that the facility typically resembles.

1264 Senior High Schools**

This category includes public or private schools for grades ten through twelve, nine through twelve, or other upper grade levels, which are authorized to grant a high school diploma. Both regular, alternative, and extended day or adult education campuses are included. Seminary high schools are also included.

Normally buildings are one or two stories in height, though three- or four-story buildings may be present.

The area contains landscaping, walkways, and glades. Buildings are either long and rectangular or have long narrow wings to maximize availability of window access. The athletic area may be a gray signature of asphalt, with a larger area of grass for a soccer field. There are also separate baseball diamond/fields, football fields/stadiums, and track ovals.

Some schools will have a swimming pool and tennis courts. A parking lot with bus loading curb area may be visible. One may find a series of buses parked there. A senior high school lot is normally about 20 to 50 acres in size. However some private high schools may be below the 2.5-acre minimum mapping resolution and will be mapped as a one acre polygon at minimum in order to be included in the data base. If the school serves a narrower or wider range of grade levels, then the school is assigned the class that the facility typically resembles.

1265 Colleges and Universities

This category includes all public or private schools that offer courses at grade level 13 or higher, conferring either professional or academic degrees. Post-high school seminaries are also included.

Normally buildings are one to four stories in height, though higher storied buildings may be present. Buildings are either long and rectangular or have long narrow lateral wings to maximize availability of window access. Some buildings, such as libraries, auditoriums, and gymnasiums, may be rectangular in shape. Many buildings have architectural design in their shapes and features. Areas within the school may be well landscaped, containing walkways, glades, quads, squares, large lawn areas, greens, or malls. Athletic areas may be separate from the main school area. Asphalt areas for basketball may be present. There are also separate baseball fields, football stadiums, track ovals, tennis courts, and swimming pools. Small streets and parking areas may be located throughout the complex. Dormitories and on-campus fraternity/sorority houses are included. Off-campus university-owned housing and off-campus fraternity/sorority houses may be mapped as a multi-family or single-family residential category.

1266 Trade Schools

This category includes all schools which provide technical, vocational, occupational, or professional training (e.g. vocational schools, occupational training centers, police academies, secretarial schools, nursing academies, technical institutes, or art institutes).

These facilities are normally smaller than and may identify themselves as, a college or university. Most facilities will be smaller than a high school and without the athletic facilities normally associated with other schools. Buildings may be any size, but normally one to two stories in height, resembling office buildings. Some buildings may be long and narrow to maximize availability of window access. The

facility will have an adjacent parking area.

1270 MILITARY INSTALLATION

Areas of military installations and associated facilities administered by the United States Armed Forces or the California National Guard. Water bodies within a military installation are coded as 4400.

1271 Base (Built-Up Area)

This category includes all developed lands (except agriculture (1272), airfields (1273), and water (4400)) within a military installation. Includes bases, camps, armories, ordnance depots, and missile sites.

Built up area may contain office buildings, residential units, industrial areas, equipment storage facilities, administrative buildings, other support facilities, parking areas, landscaping, glades, walkways, and athletic facilities. Small areas of vacant land within this category are considered part of the built-up area. Some government contracted research or industrial facilities may be located within a military reserve. Collateral data is necessary to delineate the boundaries of the military reservations.

1272 Vacant Area

This category includes all large areas of undeveloped lands within a military installation.

Includes large areas of vacant land within the military installation boundary. Small areas of vacant land within the built-up base area are considered part of the base (1271). Also included in this category are agricultural areas within the military reservation. Collateral data is necessary to delineate the boundaries of the military reservations.

1273 Air Field

This category includes air fields and associated facilities within a military installation.

Includes the landing strip, tarmac, taxiways, aircraft storage areas, hangars, and repair areas. Vacant areas within the airfield complex are included. On the aerial photos the hangars appear as large square buildings, two to three stories in height with aircraft parked nearby, with direct access to the air strip and taxiways.

1274 Former Military Base (Built-Up Area)

This category includes all developed lands (except agriculture (1272), airfields (1273), and water (4400)) within a former military installation. Includes bases, camps, armories, ordnance depots, and missile sites.

Built up area may contain office buildings, residential units, industrial areas, equipment storage facilities,

administrative buildings, other support facilities, parking areas, landscaping, glades, walkways, and athletic facilities. Small areas of vacant land within this category are considered part of the built-up area. Some government contracted research or industrial facilities may be located within a military reserve. Collateral data is necessary to delineate the boundaries of the military reservations.

1275 Former Military Vacant Area

This category includes all large areas of undeveloped lands within a former military installation.

Includes large areas of vacant land within the military installation boundary. Small areas of vacant land within the built-up base area are considered part of the base (1271). Also included in this category are agricultural areas within the military reservation. Collateral data is necessary to delineate the boundaries of the military reservations.

1276 Former Military Air Field

This category includes airfields and associated facilities within a former military installation.

Includes the landing strip, tarmac, taxiways, aircraft storage areas, hangars, and repair areas. Vacant areas within the airfield complex are included. On the aerial photos the hangars appear as large square buildings, two to three stories in height with aircraft parked nearby, with direct access to the air strip and taxiways.

1300 INDUSTRIAL

Areas where manufacturing, assembly, processing, packaging, or storage of products takes place.

1310 LIGHT INDUSTRIAL

Design, assembly, finishing, packaging, and storage of products or materials which have been processed at least once. These activities are characterized as "clean", since they produce a relatively small amount of smoke or other effluents, noise, and dust. Includes associated facilities and parking.

1311 Manufacturing, Assembly, and Industrial Services

This category includes all types of light industrial activity except those associated with the motion picture industry. Associated areas used for open storage of heavy equipment are mapped as 1323.

Most light industrial manufacturing and assembly buildings appear as large square or rectangular structures, all located in an contiguous area usually zoned for such operations. Some buildings may be long and narrow; most buildings are one story and may have very high ceilings. On the aerial photo one

can note a series of evenly spaced air conditioning units or air turbines on the roof. Many newer industrial buildings will have a white roof photo signature. The buildings are usually located in the middle of the lot, though that is not an essential requirement. There will be parking areas surrounding the building for employee parking. There is also minimal to no landscaping. Some light industrial manufacturing establishments occur together in a business, corporate, or industrial park. Others may occur in an industrial or commercial park mixed with commercial uses or offices (see code 1500). Included in this category are wholesale lumber yards and lumber milling and cutting operations. Lumber operations are distinguishable on the photo by the many large stacks of wood, pallets, and trusses. Also included are breweries, wineries, and food processing facilities. Small extractive sand and gravel operations as part of a small brick making operation are included in this category unless the extractive (code 1331) area is large enough to map as a unit by itself. Metal reprocessing facilities and recycling centers are also included. Industrial facilities located within a military reserve are mapped as military (code 1271).

1312 Motion Picture and Television Studio Lots

This category includes motion picture company and television production studios as well lots or open areas used for outdoor sets. Also included are permanent remote lots used for production.

Various types of structures may appear on the lot. Offices would appear as long narrow buildings, possibly with wings. Sound stages may appear as very larger square or rectangular buildings. The buildings may appear in a series or in rows. The back lot areas may appear as non-descript open areas with various smaller structures and vegetation.

1313 Packing Houses and Grain Elevators

This category includes facilities used for the packing and storage of produce for shipment to markets or processing plants.

Packing houses and grain elevators are usually located adjacent to railway lines. They can occur in urban industrial areas, although they are normally located in rural agricultural areas. Packing houses are large, rectangular warehouse type buildings. Grain elevators consist of one to several adjacent, tall, cylindrical metallic structures. The elevators may be adjacent to associated buildings.

1314 Research and Development

This category includes industrial complexes where product, technology, or idea development and research is the primary function.

Normally research and development is part of a commercial or industrial business and is housed within structures of that primary use. However, some research and development takes place in separate areas or structures apart from or adjacent to its associated parent facility. Research and development facilities contain office buildings and laboratories. Some light industrial-type structures may also be present. Off-campus university field laboratories are included. Academic institutions, however, are not included in this class. Research and development facilities located within a military reserve are mapped as military (code 1271).

1320 HEAVY INDUSTRIAL

Industrial and manufacturing facilities of a large magnitude involving the processing of raw materials. It is considered relatively "dirty" since wastes such as smoke, slag, dust, and liquid effluent, as well as noise, are often generated. Includes associated facilities and parking areas.

1321 Manufacturing

This category includes large operations of manufacturing activities such as large brick, cement, and asphalt production facilities. This category does not include Petroleum Refining and Processing (see code 1322), Open Storage (see code 1323), Major Metal Processing (see code 1323), and Chemical Processing (see code 1325).

These facilities may appear as several large buildings or as a complex on a large lot, with parking. The layout of the complex buildings may not be orderly. The facility may have access to several spurs of a railroad system taking advantage of the transportation network. Raw materials may be stored in the open or in large silos. The area appears to be very "dirty" from the fallout of raw materials or industrial waste products.

Manufacturing plants are usually located in an area of other similar operations or with light industrial areas.

1322 Petroleum Refining and Processing

This category includes major oil refineries, as well as associated petrochemical plants.

Petroleum operation photo signatures have a "dirty" gray to black appearance over the entire facility. Large pipes, vats and storage tanks are compactly situated over the entire area. Typically there are acres of storage tanks situated in a matrix formation. Petroleum refining facilities are located adjacent to major harbor facilities, or may be located on the coast where tankers may unload their crude oil from offshore intake pipes. This category does not include oil well or exploration areas (see code

1332).

1323 Open Storage

This category includes wrecking yards, junk yards, storage of heavy equipment not related to maintenance, and other salvage and recycling operations. Also included are outdoor areas used for storage of light or heavy industrial products. This class does not include open storage of new cargo at harbor facilities (see code 1411).

The photo signature for wrecking and junk-yards appears as a lot containing many cars in high concentration lined up in columns or rows with dirt access "lanes" in between. Other junk-yards may appear as non-descript areas of large metallic material lying in an area in no particular order or arrangement. Open storage of light or heavy industrial products appear as large yards in an industrial area with a relatively neat organization of heavy equipment. Also included are non-commercial lots containing what appears to be abandoned equipment, usually stored in a disorderly fashion. Cargo storage areas located in railroad yards are coded as Railroad (code 1412).

1324 Major Metal Processing

This category includes all foundries, smelters, stamp mills, and other heavy metal manufacturing or processing plants, with the exception of recycling centers or wrecking yards.

The photo signature appears as an area, many acres in size, containing many square to rectangular or long narrow buildings, with air turbines or air conditioning units on the roofs. Situated within the area are numerous smoke stacks and pipes. The area is also tinged with a "dirty" gray color. Also included are associated "slag heaps".

1325 Chemical Processing

This category includes major chemical refining plants and their associated facilities.

Chemical processing plants may appear as office type buildings used for administrative purposes, with larger industrial type buildings, large pipes, and tanks for movement and storage of necessary liquids or gases.

1330 EXTRACTION

Areas whose use is devoted to the extraction of mineral and rock products. Includes associated mining area, facility structures, and parking areas.

1331 Mineral Extraction - Other Than Oil and Gas

This category includes surficial extraction of minerals and rock products, including sand, gravel, clay, diatomaceous earth, metals and other non-metals. Includes quarries, open pit mines, and borrow pits.

Also included are surficial structures related to below ground mine activities. This class does not include oil and gas extraction (see code 1332).

Most quarries will appear as a giant hole dug in the earth, with steep-sided edges. On the top surface and down in the pit there will be little or no vegetation due to the disturbance of the ground by earth movers. Ponds of water may be located in the pit or on the upper ground surface. Tailing piles may be located nearby, adjacent to, or on the mining site. Sand and gravel operations are usually located in or near river floodplains. Sand and gravel pits may have the extracted material piled in the pit or adjacent to the pit on the upper ground surface, with storage bins and long linear conveyor belts crossing the piles. Borrow pits may appear only as small one- to 3-acre areas of graded land with little or no vegetation located near a highway or built up area. The borrow pit was extracted for fill dirt. Some short escarpments may be found at the edges of the borrow pit. Most underground mining operations have limited surface exposure. Some shaft or mining operation out-buildings may be located in a mappable cluster, with some adjacent tailings.

1332 Mineral Extraction - Oil and Gas

This category includes oil and gas extraction and associated surface storage facilities. Subsurface known or suspected reserves are not included. Offshore oil and gas extraction is not included.

Oil and gas extraction fields can be distinguished by the presence of a series of tall oil derrick towers or oil pumps. The derricks appear as a group of concentrated long shadows on the aerial photo. Some areas have only the oil pumps, without derricks, scattered within a field area. Some oil field pumps may be located in a built-up area. By itself, a pump is below mapping resolution, but when situated in a group, the area may be mappable. An oil field area appears on the aerial photo as an extensive network of roads and small clearings usually located on a hill or mountain slope. Most fields are identified on the basemap. Built-up uses take precedence over the mapping of pumps.

1340 WHOLESALING AND WAREHOUSING

1340 Wholesaling and Warehousing

This category includes storage, supply, or distribution warehousing or wholesale shipping centers other than those which are integral parts of airports, transportation centers, and harbor facilities.

The warehouse structures appear similar to light industrial manufacturing buildings in that most are large squares or rectangular in size and shape, with few or no air turbines or air conditioning units on the roof. The building is typically located near the middle of the lot, with very little employee parking. On the aerial photo one may be able to see long narrow truck trailers lining the edges at the loading docks. Other truck trailers may be parked within the lot. Usually there is little or no landscaping, and very little parking. Only large high volume operations may have larger employee parking areas. This category does not include Truck Terminals (1416). Open storage of heavy equipment is coded 1323.

1400 TRANSPORTATION, COMMUNICATION, AND UTILITIES

Major structures and facilities associated with forms of transportation, communication, and utilities.

1410 TRANSPORTATION

Areas devoted to major transportation, such as airports, freeways, roads, railways, and harbors facilities.

1411 Airports

This category includes all airports, air fields, and air strips, heliports, and their associated parking and storage facilities.

The airport area includes repair and storage hangars, aircraft parking areas, taxiways, and the vacant areas at the ends of and between runways. On the aerial photo the hangars will appear as large rectangular or square structures adjacent to the runway/taxiway and aircraft parking area. In major airports, passenger terminals and automobile parking areas are also included, as well as air freight facilities. Also included in this class are heliports and land associated with seaplane bases. Also included are car rental establishments located within the airport complex. Off-site car rental locations are mapped as modern strip development (code 1223). Vacant and agricultural areas within the airport boundary are coded 3100 and 2110 or 2120 respectively.

1412 Railroads

This category includes train terminals, stations, associated parking areas, roundhouses, repair and switching yards, and railbed rights-of-way, including spurs and sidings. Also included are cargo storage and transfer areas located within the railroad yards. The width of the rights-of-way must be at least half the width of a 2.5-acre square to be included.

Railroad beds appear on the aerial photo as a continuous dark, narrow line with an adjacent band of off-white on each side. The railroad beds appear very similar to minor roadway beds, except they are

narrower and are continuous for miles. Terminals and switching yards appear as an abrupt multi-branching of the line, becoming polygonal areas, rather than linear. One may be able to see the railroad cars on the photo. Spurs and sidings may be below resolution. They appear as two or three tracks branching off side by side next to the main track or as a branch of the track veering off in another direction. Railroad rights-of-way are normally below minimum mapping resolution, so only those areas meeting the minimum resolution are mapped. Major railroad stations will appear as a large facility with parking and a large building adjacent to the railroad tracks. The tracks may be under a large covering, or have covered platforms adjacent to each track.

1413 Freeways and Major Roads

This category includes freeways, interchanges, major roadways, and their adjacent rights-of-way. The delineations include the roadbed, landscaped areas, access routes, and associated adjacent drainage ways. Also included are rest areas, weigh stations, and toll booths.

All freeways are to be mapped, as well as major roadways that are at least half the width of a 2.5-acre square. Freeways appear as two to six lane roadways with adjacent landscaping and center divider, with interchanges, overpasses, and underpasses. The freeway lane signature is gray to white. Rest areas appear as landscaped areas with small structures (bathrooms and picnic overhangs) and parking areas. On the photo one may be able to see cars and large trucks parked. Normally there is a rest area located on each side of a freeway at the same location. There is an off-ramp and an on-ramp from the freeway to each rest area. Toll booth plazas appear as a sudden widening of the roadway into many lanes that run into a long, narrow covered area dissecting the roadway. On the other side of the booths, the lanes converge again to form the freeway lanes. Road cuts are mapped as vacant land (3100), not as part of the 1413.

1414 Park and Ride Lots

This category includes Cal Trans park and ride lots provided for commuter ridesharing, buspooling, vanpooling, and carpooling purposes.

Park and ride facilities appear similar to parking lots and are located near major freeways or highways. Some park and ride lots are located in retail center parking lots. Collateral data is necessary to map these facilities.

1415 Bus Terminals and Yards

This category includes areas used as bus terminal facilities, including bus storage and maintenance.

Major bus terminals and storage/maintenance yards appear as large parking areas for buses. On the aerial photo one may be able to see a number of buses parked side by side or one behind the other. School bus yards are also included. School buses will appear as yellow in color, with a white roof and, in some cases, large black numbers painted on top.

1416 Truck Terminals

This category includes areas used as truck or highway freight terminals, freight transfer, or large truck stops where there is a high level of truck activity.

Truck terminals and freight transfer structures will appear as small rectangular buildings with the large truck trailers parked all around at the loading docks. Additional trailers may be parked on the lot. There is not very much employee parking. Warehousing is not included in this category (1340). Large truck stops are located adjacent to freeways and contain services such as gas stations, restaurants, motels, and truck repair. On the aerial photo one can see a large truck trailer parking area, with trucks. Small truck stops are mapped as part of modern strip development (code 1223).

1417 Harbor Facilities

This category includes port and dock facilities and associated storage areas. Includes shipyards, dry-docks, locks, waterway control structures, buildings and associated parking areas. Marinas are included in Other Open Space and Recreation (see codes 1880 and 4300). Harbor-use in the adjacent water body are included in Water (code 4200).

Major harbor facilities are located at the ocean, within close proximity to or within a large metropolitan area. Numerous wide channels and "sea lanes" are available for ships to pass in, out and through the facility. There are numerous slips and berths for loading and unloading of cargo, as well as large areas for container or cargo storage. Other facilities include ship repair and ship building areas. There may also be tanks for storage of petroleum products not associated with a refinery. Other adjacent facilities, such as heavy or light industrial are mapped into their respective categories. All water associated with the harbor facilities is included in class 4200, Harbor Water Facilities.

1418 Navigation Aids

This category includes areas occupied by facilities necessary to aid navigation, such as lighthouses.

Lighthouses will appear on the coast at prominent points where sea navigation may be hazardous. There is usually an area set aside for the light itself, keepers quarters, other navigation and

communication antennas, as well as some landscaping. When viewed in stereo one may be able to discern the lighthouse tower. Other navigation aids such as beacons, horns, and communication antennae, and VORTACs may be below minimum mapping resolution.

1420 COMMUNICATION FACILITIES

1420 Communication Facilities

This category includes areas used for airwave communications, including radio, radar, television, telephone, and microwave facilities.

Most communication facilities are below minimum mapping resolution, unless many antennae towers and structures are located together. These facilities are normally made up of one or more antennae or towers, sometimes including one to a few small square or rectangular buildings. Radio towers occur as a set of 3 tall towers on a lot, whereas TV towers occur as one large, tall tower. Microwave towers are usually individual, shorter towers. Telephone central offices are normally enclosed in a one- or two-story, square or rectangular building in a built-up area.

1430 UTILITY FACILITIES

Areas which are used for the production and transmission of electricity, and the treatment or transportation of water, sewage, and fuels.

1431 Electrical Power Facilities

This category includes facilities engaged directly in the generation and distribution of electricity. Included are power generating stations (thermal, nuclear, hydroelectric, coal, steam, wind energy farms), substations, and transmission line rights-of-way. Transmission line rights-of-way are mapped if the width of the corridor is at least half the width of a 2.5-acre square. This class does not include administrative offices.

Electrical power plants appear similar to heavy industrial operations. The facility contains smoke or steam stacks with vents, piping, tanks, towers, and racks containing transformers and other electrical equipment. Several transmission line corridors converge at power plant sites. Substations appear as metal racks containing the transformers and other electrical equipment. They may be as small as 1/4 acre to as large as several acres. The racks are normally located near the center of the lot, with the ground surfaced in gravel. One to several transmission line corridors converge at the substation. The transmission line corridor appears as a linear swath of land traversing the landscape. The corridor may be located along the side of a street and be very narrow or located in vacant areas and be as wide

as 1/4 mile if the corridor contains several transmission line towers. On the aerial photo one may be able to see the individual tower areas as a white dot immediately surrounded by a small graded area. Leaning away from each dot one may be able to see the black shadow of the tower or power pole. One can follow these dots from tower to tower along the corridor, from substation to substation or power plant. Some corridors contain other uses such as nurseries, orchards, cropland, or pastures within the right-of-way. The other uses underlying a transmission line take precedence. If the underlying use is vacant, the electric transmission line corridor takes precedence. Only corridors that are above the minimum mapping resolution are mapped.

1432 Solid Waste Disposal Facilities

This category is used for active dumps and sanitary landfill operations, and their associated facilities.

Most landfills in southern California are located in old excavated gravel pits or in canyons. They will appear as large extents of graded area, or if located on a plain, will appear as an extensive graded mound. The pit or canyon may appear to be partially or significantly filled, with tractors or other heavy excavating equipment on its surface. These facilities are normally located away from areas of human habitation or areas of high human concentration or activity. Other uses overlying a closed, abandoned, or inactive landfill take precedence.

1433 Liquid Waste Disposal Facilities

This category includes sewage treatment and liquid waste treatment plants and associated spreading grounds, aeration fields, and water injection plants. Also included are associated facilities and parking areas.

The aerial photo signature will normally show about four circular tanks, each with a linear pipe forming a radius within the tank. Surrounding the tanks may be some small ponds, site office, and parking facilities.

1434 Water Storage Facilities

This category includes most small water reservoirs and water tanks used for domestic water supply. Included are any associated facilities and dams.

The reservoirs include all covered water storage facilities and water tanks. Open water bodies used for water storage are included if they are below 5 acres in area, otherwise they are mapped as Water (see code 4100). Water tanks appear on the photo as a small round light colored structure. Covered reservoirs may be circular, oval, or rectangular in shape. Dams associated with water storage

reservoirs are included. Dams associated with flood control are mapped as code 1437.

1435 Natural Gas and Petroleum Facilities

This category includes major natural gas and petroleum distribution systems. Included are pumping facilities, and storage facilities not associated with a refinery. Not included are underground storage facilities.

Pipeline rights-of-way at least half the width of a 2.5-acre square are mapped. Most of the facilities require collateral data in order to be mapped. Large tank farms not associated with a refinery are included.

1436 Water Transfer Facilities

This category includes major above-ground water distribution channels, aqueducts, water treatment, filtration (non-sewage), reclamation (non-sewage), and pumping facilities.

Examples of water transfer are the California Aqueduct and Coachella Canal which appear on the aerial photo as a linear open water, concrete lined canal; and the Los Angeles Aqueduct which appears as a linear, large, above-ground pipeline. Most of the facilities can be identified on the collateral data. This category does not include improved flood channels and structures (see code 1437).

1437 Improved Flood Waterways and Structures

This category includes flood control channels and dams, detention ponds, percolation basins, and debris dams.

Most improved flood control channels are channelized and/or lined with concrete. The photo signature shows a white to off-white color representing the concrete lining. Percolation basins are a series of basins adjacent to a flood control channel where flood water is allowed to recharge the groundwater. Debris dams are normally earthen, but may contain a concrete spillway. They are located at the mouth of canyons or downstream of the canyon, and contain a vegetated, though dry to intermittent back pond. Dams associated with water storage are mapped as code 1434. The improved flood waterways and structures are usually identified on the collateral data.

1438 Mixed Wind Energy Generation and Percolation Basin

This category is used where electrical power facilities such as wind energy generation farms and improved flood structures, such as percolation basins occur together in a double use fashion. The

wind energy towers are located on the levees between the basins.

1440 MAINTENANCE YARDS

1440 Maintenance Yards

This category includes maintenance facilities owned and operated by a major utility or government agency. Included are repair and storage yards.

Maintenance yards normally contain an L-shaped or long, narrow rectangular, single story building. The lot contains a number of parked company vehicles and heavy equipment or machinery. Also stored on the lot is other maintenance or replacement equipment. Construction materials may also be stored on the lot. Collateral data and field verification are required for mapping.

1450 MIXED TRANSPORTATION

1450 Mixed Transportation

This category includes areas where more than one transportation use is present and neither dominates.

This class may be used when a highway occurs adjacent to a railroad and together the width of the right-of-way is above the 2.5-acre minimum mapping resolution. Each individual right-of-way may be below resolution. Where a 1450 is crossed by a freeway (1413), the freeway takes precedence in the overlap area.

1460 MIXED TRANSPORTATION AND UTILITY

1460 Mixed Transportation and Utility

This category includes areas where a transportation and utility right-of-way occur together or side by side and neither use dominates.

This class may be used when a highway or railroad occurs adjacent to a transmission line corridor or an improved flood control channel. Together the combined right-of-way is above the 2.5-acre minimum mapping resolution. Each individual right-of-way may be below resolution.

1500 MIXED COMMERCIAL AND INDUSTRIAL

1500 Mixed Commercial and Industrial

This category includes both commercial and industrial land uses occurring together, or in close

proximity. Each individual land use unit is below the 2.5-acre minimum mapping resolution and neither use dominates.

Typically this class occurs at some "industrial", "commercial" or "business" parks that contain a mixture of light industrial use, offices, warehouse/distribution use, retailing, and personal services. These complexes usually contain one or more buildings rectangular in shape, with minimal landscaping. Each building is similar to a typical light industrial building. Buildings composed predominantly of retail businesses are coded 1223, and those composed predominantly of light industrial are coded 1311. This class is also used in areas not located in a complex, but the industrial and commercial classes do follow the definition above. Also included are areas where a combination of commercial and industrial use occur within the same building.

1600 MIXED URBAN

1600 Mixed Urban

This category includes built-up areas where there is a mixture of uses occurring within a specific area, and no one class dominates.

In these areas no one class can be mapped above the 2.5-acre minimum mapping resolution. This class typically occurs in smaller towns or villages where there are various uses in a small area. It may also occur in older areas where consistent zoning was not in force at the time of construction of structures. Also included are areas where a mixture of uses occur within the same building. For example, an older commercial strip may contain adjacent buildings where commercial use occurs on the first floor and, in all buildings, either residential or offices occur in the upper floors.

1700 UNDER CONSTRUCTION

1700 Under Construction

This category includes facilities that were under construction at the time aerial photography was taken, or at the time of field verification. Structure use and/or extent cannot be or is difficult to determine.

The aerial photo signature shows a newly graded area with no vegetation. Pad platforms or foundations may be visible. Partly constructed structures may also be visible. If the use and its extent can be determined, then the polygon is categorized with its known use.

1800 OPEN SPACE AND RECREATION

Developed open areas within urban settings, and urban and non-urban open areas developed for recreational activities.

1810 Golf Courses

This category includes public and private courses including driving ranges, greens, fairways, links, hazards, buildings, and parking areas.

Golf courses appear on the photo as areas containing long green grass areas lined with trees. The greens have hazard ponds and white sand traps adjacent to them. There can be nine or eighteen fairways/greens. Typically there is a main building serving as the clubhouse/office/restaurant. Driving ranges not associated with a golf course are mapped as Other Open Space and Recreation (code 1880). Most golf courses are identified on the collateral data. Residential areas within golf courses are mapped separately as their residential type. Water bodies that are greater than 2.5 acres are mapped as 4100.

1820 Local Parks and Recreation

This category includes neighborhood, city, town, or community parks, and sports fields, and their associated parking facilities. Beach parks are not included (see code 1870).

Local parks are typically small, up to several city blocks in size, but basically serve the immediately surrounding community. The photo signature shows a green grass area with trees scattered throughout, though trees are not a requirement of this class. The park may contain limited sports facilities. Parking is usually on the street, though there may be one or more parking lots. The sports fields are usually softball fields, basketball courts, tennis courts, or soccer fields, though some parks also contain swimming pools. Some parks also contain a recreational building or multi-purpose building, with offices and indoor sports facilities. Private parks serving a development or subdivision are included. Most parks are identified from collateral sources. In some cities, school athletic field/playground areas are also considered parks, therefore these areas were mapped as parks.

1830 Regional Parks and Recreation

This category includes developed land within parks designed to serve a regional area. All facilities within the park, such as campgrounds, marinas, or boat launching facilities, are included in this class.

Regional parks are typically large, and may include undeveloped areas. The undeveloped portions of parks are mapped as vacant (see code 3100). The photo signature shows green grass areas, as well as

tree-covered areas. The park may have one or more roads winding through it, depending on the size of the park. The park usually contains a number of sports facilities, such as basketball courts, tennis courts, softball fields, soccer fields, and swimming facilities. Water bodies within regional parks that are above mapping resolution are coded 4100. Beach parks are not included (see code 1870). Where multiple uses occur within a regional park, for example golf course, agriculture, flood control, etc., the use other than Regional Park takes precedence. Most regional parks are identified on collateral sources.

1840 Cemeteries

This category includes public and private cemeteries, memorial parks, mausoleums, and other burial grounds. Included are associated facilities and parking areas.

Cemeteries appear on the photo as green grass areas, similar to local parks. Cemeteries, however, contain roads configured as a grid network or with a center oval. The interpreter may be able to see subtle lineation representing the tombstones, plaques, and flowers at each grave. One or more buildings are found on the lot which may include a mortuary, chapel, office, or crematory. A line of cars may be seen on the photo if a funeral was in progress at the time of exposure.

1850 Wildlife Preserves and Sanctuaries

This category includes public and private facilities, and developed areas devoted to the preservation of wildlife species and habitats. This class includes such uses as zoos, wild animal parks, duck ponds, exotic animal farms, etc.

Zoos appear as large areas with many buildings and much vegetation in a confined area, with numerous walkways. A large parking lot is adjacent to the facility. Other wild animal facilities are typically located outside the urban area in canyons and are not open to the general public. Most wild-life preserves and sanctuaries will be identified on collateral data. Undeveloped areas within national and state preserves and sanctuaries are mapped as 3100.

1860 Specimen Gardens and Arboreta

This category includes botanical gardens or arboreta devoted to preserving living specimens of vegetation for scientific or cultural purposes.

These facilities are identified on collateral data. The photo signature will show a well manicured, highly vegetated area, with numerous walkways, buildings, and greenhouses, with an adjacent parking area. Arboreta associated with colleges or universities are mapped as 1860.

1870 Beach Parks

This category includes all public and private beach parks. The facilities include bathhouses, barbecue pits, parking areas, sports areas, as well as the beach area.

Beach parks are identified on the collateral data. The aerial photo signature shows a white to tan color for the sand area, and a gray signature for parking areas. Some buildings may be located adjacent to the parking lots.

1880 Other Open Space and Recreation

This category includes developed portions of public and private recreational facilities that are not described in the other open space and recreational categories above. Included are camps, campgrounds (unless within a regional park (1830)), outdoor shooting ranges, ski areas, marinas, and driving ranges not associated with a golf course. Also included are maintained grass areas not used or designated as a local park.

Most of these facilities are identified on the collateral data. Marinas are located adjacent to harbors, and contain small piers, with numerous boats. The water portion of a marina, where the boats are moored, is mapped in the Water category (see code 4300). Ski areas are typically located in mountains above 5000 feet. The area contains a series of wide linear clearings that may braid with each other. A series of towers representing the chairlift system can be seen on the aerial photo. Campgrounds appear as an area with narrow roads circling within, with offshoot segments representing each campsite area. Campgrounds are also identified on collateral sources.

1900 URBAN VACANT

1900 Urban Vacant

This category includes open undeveloped land within urban areas that are not associated with a particular facility.

Typically these areas are vacant lots. They normally contain no structures but may have such improvements as curbs and sidewalks. The land may be in a graded condition showing little or no vegetation, or may be in a successional vegetated state, with numerous shrubs and grasses, in a non-uniform, unkept condition. Not included in this class are terraced erosion control embankments (see 3100).

2000 AGRICULTURE

Agriculture includes land used primarily for the production of food, fiber, and livestock. Included in these classes are associated structures and facilities.

2100 CROPLAND AND IMPROVED PASTURE LAND

Included here are active field and row cropland areas and improved pasture lands. The croplands include cultivated, in crop, harvested, fallow or temporarily idle land. The improved pasture land may be in pasture year-around or be in the cropland seasonal rotation. Improved pasture land does not include rangeland (see code 3100).

2110 Irrigated Cropland and Improved Pasture Land

This category includes all irrigated field and row cropland areas, and irrigated improved pasture land.

The majority of row crops in southern California is irrigated. The photo signature for active cropland will show one of several signatures. If the land is in field crop, the signature will show a uniform, smooth texture area, with a green color. Land that is in row crop will appear similar to field crop, except the individual rows can be distinguished as narrow parallel lineations. Land that is being made ready for crop or has been harvested will appear as a uniform, smooth texture of off-white to tan color representing the just graded or plowed field. Fallow fields will appear similar to vacant lots or disturbed vacant land. The area will appear unkempt, with a non-uniform texture representing a mixture of shrubs and grasses in a successional state. Fallow land will occur in close proximity to in-crop areas. The improved pasture land photo signature may appear similar to the cropland signature. Most improved pasture lands are mapped as non-irrigated (2120). In many cases post-harvest field crop, row crop, or fallow area will be used for pasture of livestock. Cropland and improved pastures may occur within electrical transmission line rights-of-way.

2120 Non-Irrigated Cropland and Improved Pasture Land

This category includes all non-irrigated cropland, including dry-farmed field crops.

Most non-irrigated cropland is represented by dry-farmed field crops such as peas, beans, barley, oats, and hay. The photo signature for field crop will show a dull green to mottled brown color with smooth, uniform texture. Furrows or plow marks may also be visible. Dry farmed areas may appear very similar to natural grass vegetation. Land that is being made ready for crop or has been harvested will appear as a uniform, smooth texture of off-white to tan color representing the just graded or plowed field. Fallow fields will appear similar to vacant lots or disturbed vacant land. The area will appear unkempt, with a non-uniform texture representing a mixture of shrubs and grasses in a

successional state. Fallow land will occur in close proximity to in-crop areas.

2200 ORCHARDS AND VINEYARDS

2200 Orchards and Vineyards

This category includes commercially productive tree, bush, and vine crops.

Orchards include fruit and nut trees, and bush crops. The photo signature for citrus orchards appear as dark green, coarse textured areas, where the individual trees are distinguishable. The trees are aligned in a matrix form, with crowns appearing to abut each other. Nut and other fruit trees are similar, however, the color will be a lighter shade of green. The trees are aligned in a matrix form, with crowns abutting each other. Bush crops are similar to orchards, however, they may be configured in rows rather than a matrix, and are much shorter in height. The photo signature for vineyards will appear as dark green, coarse-textured, thin linear rows that, when measured, will be approximately five to ten feet apart. The height of vineyards is shorter than orchards. The orchard and vineyard areas will be neat and uniform. Orchard areas typically are formed as square plots of land, whereas vineyard plots typically form two sections on a similar-sized plot of land. In many cases orchards occur within electrical transmission line rights-of way. It is important to use stereo viewing, to avoid confusing vineyards with row crops.

2300 NURSERIES

2300 Nurseries

This category includes land managed for the production of ornamental trees, plants and flowers, vegetable seedlings, seed farms, sod farms, and wholesale greenhouses.

Nurseries typically appear similar to row crops in configuration. The photo signature, however, reveals that it is an area of non-uniformity, where a few rows appear similar, then the next few rows are of a different type of plant, and so on. Trees may occur in some rows, then plants in the next section. Greenhouses or hot houses may also occur in some row areas, or in separate areas altogether. Greenhouses typically appear as long narrow structures abutting each other with steeply pitched roofs.

Together the roofs give an accordion effect.

In many cases nurseries occur within electrical transmission line rights-of-way. Also included in this

category are Christmas tree farms, which appear on the photo as groves with uneven spacing, smaller crown cover, and open space between the trees. On the aerial photo, sod farms appear similar to pasture or field crop; therefore, some field verification is necessary. Abandoned greenhouse structures are mapped as 2300.

2400 DAIRY AND INTENSIVE LIVESTOCK, AND ASSOCIATED FACILITIES

2400 Dairy and Intensive Livestock, and Associated Facilities

This category includes large, specialized livestock and other specialty farms. These areas have a high concentration of animal population in a relatively small area. This class includes beef cattle feed lots, dairies, hog farms, and goat farms.

Livestock feedlots and dairies appear similar in that both contain a series of small fenced areas with a very high concentration of animals. Dairies contain simple rectangular shade structures that are evenly and widely spaced over the area. Structures for protecting stored hay bales may be present. Dairies also contain structures used for milking.

Both feedlot and dairies contain fenced areas with a very dark to black photo signature representing dung piles. Large fertilizer mounds associated with dairies are mapped as 2600. Pasture and field crop adjacent to and associated with dairies are mapped as 2110. Abandoned dairy structures are mapped as 2400.

2500 POULTRY OPERATIONS

2500 Poultry Operations

This category includes poultry operations such as chicken, turkey, and egg farms.

Poultry farms typically contain a series of long, narrow enclosed structures in a parallel, side-by-side configuration. The photo signature shows each structure as having a white pitched roof, typically with air conditioning units. Grain feed storage structures may be located at the ends of the building. One to ten structures may occur in each group. Major poultry manure spreading grounds are coded 2600.

2600 OTHER AGRICULTURE

2600 Other Agriculture

This category includes other miscellaneous agricultural facilities not described in the agricultural categories above. These facilities include storage facilities, dairy fertilizer piles, poultry manure spreading grounds, hydroponic farms, fish hatcheries, apiaries, and worm farms. Also included are backyard lots of mixed agricultural/non-agricultural use that meet the MMU.

Storage facilities can include isolated barns, or other structures located in, or adjacent to an agricultural area. Also included are small plots of land where heavy equipment or machinery is stored within the agricultural field area. Fish hatcheries may be identified on the basemap or on the collateral maps. Typically they appear as a series of small square or rectangular ponds adjacent to several small buildings. Track ovals not associated with a horse ranch are coded 2600. Backyard agriculture may include improved pastures, barns, and/or corrals. These areas are mapped as part of the residential class if the land use is less than 2.5 acres in size.

2700 HORSE RANCHES

2700 Horse Ranches

This category includes commercial and non-commercial horse ranches, stables, tracks, barns, and corral areas, and improved pastureland. The 2700 class also includes backyard horse facilities, i.e. track ovals, walking rings, stables, barns, etc., that meet the MMU. Horse racing track facilities are mapped as Commercial Recreation (code 1232).

Stables appear as one or more long, narrow buildings within a farm complex, adjacent to pastures (irrigated pastures are coded as 2110). Horse tracks are large dirt oval tracks located at the horse ranches. Track ovals not associated with a horse ranch are coded 2600. Corral areas, included horse corrals associated with residential areas, are coded 2700. Improved pasture areas are fenced, containing water troughs, and possibly shade structures or enclosures. Improved pastures differ from fenced rangeland in that pasture contains smaller fenced areas, typically with individual enclosures of less than one hundred acres. Horse ranches may also occur within electrical transmission line rights-of-way.

3000 VACANT

Vacant areas include land that has not been built-up with man-made structures, and contains no agriculture or

waterbody. The area is open, containing natural or disturbed natural vegetation. Rangeland is included in this category. Areas containing abandoned structures are mapped as their previous use.

3100 Vacant Undifferentiated

This category represents most occurrences of vacant land.

This class does not include vacant lots in urbanized areas (see code 1900), although terraced erosion control embankments are included. Also included in this category are road cuts. Undeveloped areas of parks are also included. Most vacant land is in a natural state, containing tree, brush/shrub, and/or grassland vegetation. No or few significant structures or improvements are present. Rangeland may be open land or fenced over large areas. Rangeland vegetation may be no different than open vacant land, or may contain grassland for grazing livestock. Eucalyptus groves are also included.

3200 Abandoned Orchards and Vineyards

This category includes orchards and vineyards, formerly productive, now abandoned and not in commercial production.

Abandoned orchards and vineyards may contain successional or weedy vegetation between the rows. The photo signature may show and the field check may verify an unkept condition. Many trees or vine plants may be dead, or totally removed. If a significant number of trees remain on the lot, then the polygon is coded 3200. If most trees have been removed, then the polygon is mapped as Urban Vacant (code 1900) or Vacant Undifferentiated (code 3100).

3300 Vacant With Limited Improvements

This category includes areas where streets have been laid in a subdivision pattern, but no further building or improvements have occurred over time.

Typically, the photo will show a network of streets, dirt or paved, but with no structures. The lots will be vacant, with natural vegetation.

3400 Beaches (Vacant)

This category is used for vacant coastal beach areas not associated with a national, state, county, or municipal beach park.

The photo shows a white to tan signature of the sand area. The collateral data does not show these areas to be beach parks.

4000 WATER

Water includes open water bodies which are greater than 2.5 acres in size.

4100 Water, Undifferentiated

This category includes all open water bodies greater than 2.5 acres in area not associated with water storage; and all water bodies associated with water storage that are greater than 5 acres in size.

Included in this class are oceans, lakes, reservoirs, golf course ponds, rivers, estuaries, and channels.

The water must occur perennially.

Water body delineations follow those depicted on the 7.5 minute U.S.G.S. topographic quadrangles, unless the configuration of the water body has changed significantly. Water bodies at low water levels are mapped at their normal levels to account for drought years. The photo signature for water is blue to dark blue.

4200 Harbor Water Facilities

This category includes the water portion of harbor facilities. These include the slips and berths where the ships load and unload, the shipping channels, and outer harbor area within the outer jetty.

4300 Marina Water Facilities

This category includes the water portion of marina facilities composed primarily of the boat mooring areas. The aerial photo will show an area of buoys or anchorages where the small pleasure boats moor or "park".

4400 Water Within a Military Installation

This category includes all water bodies within a Military Installation of 2.5 acres or larger in size.

4500 Area of Inundation (High Water)

This category includes the areas of water inundation. This occurs at the Salton Sea and includes the area from the basemap's designated shoreline to the 1990 shoreline as shown on the aerial photo.

This situation also occurs at Lake Skinner where the 1990 shoreline is greater than the basemap shoreline.

9999 No Photo Coverage

Areas in which no photo coverage was available for land use mapping in the study. Lack of coverage

was usually due to air space restrictions near military reservations.

Appendix H

Central Basin Adjudication

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County of Los Angeles

DEC 23 2013

Sherri R. Carter, Executive Officer/Clerk
By Marisela Fragoso, Deputy

8 SUPERIOR COURT OF THE STATE OF CALIFORNIA
9 FOR THE COUNTY OF LOS ANGELES

10 CENTRAL AND WEST BASIN WATER
11 REPLENISHMENT DISTRICT, etc.,

12 Plaintiff,

13 vs.

14 CHARLES E. ADAMS, et al.,

15 Defendant

16
17 CITY OF LAKEWOOD, a municipal
18 corporation,

19 Cross-Complainant

20 vs.

21 CHARLES E. ADAMS, et al.,

22 Cross-Defendants.

Case No.: 786,656

23 THIRD AMENDED JUDGMENT

24 (Declaring and establishing
25 water rights in Central Basin,
26 enjoining extractions
27 therefrom in excess of
28 specified quantities
and providing for the storage and
extraction of stored water.)

Assigned for all purposes to
Hon. Abraham Khan
Dept. 51

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1 The original judgment in this action was entered on or about August 27, 1965. Pursuant
2 to the reserved and continuing jurisdiction of the court under the Judgment herein, certain
3 amendments to said Judgment and temporary orders have heretofore been made and entered.
4 Continuing jurisdiction of the court for this action is currently assigned to Hon. Abraham Khan.

5 The Motion of Plaintiff WATER REPLENISHMENT DISTRICT OF SOUTHERN
6 CALIFORNIA (which originally brought this action under its former name “Central and West
7 Basin Water Replenishment District”), and of defendants, City of Lakewood, City of Long
8 Beach, Golden State Water Company, California Water Service Company, City of Los Angeles,
9 City of Cerritos, City of Downey, City of Signal Hill, Pico Water District, Bellflower-Somerset
10 Mutual Water Company, LaHabra Heights County Water District, City of Norwalk, Orchard
11 Dale Water District, Montebello Land & Water Company, South Montebello Irrigation District,
12 Sativa Los Angeles County Water District, City of Vernon and Central Basin Municipal Water
13 District (“Moving Parties”) herein for further amendments to the Judgment, notice thereof and of
14 the hearing thereon having been duly and regularly given to all parties, came on for hearing in
15 Department 51 of the above-entitled court on December 18, 2013 at 9:00 a.m. before said Hon.
16 Abraham Khan. This “Third Amended Judgment” incorporates amendments and orders
17 heretofore made to the extent presently operable and amendments pursuant to said last
18 mentioned motion. To the extent this Amended Judgment is a restatement of the Judgment as
19 heretofore amended, it is for convenience in incorporating all matters in one document, is not a
20 readjudication of such matters and is not intended to reopen any such matters. As used
21 hereinafter the word “Judgment” shall include the original Judgment entered in this action as
22 amended to date, including this Third Amended Judgment.

23 There exists in the County of Los Angeles, State of California, an underground water
24 basin or reservoir known and hereinafter referred to as the “Central Basin” or “Basin” described
25 in Appendix “1” to this Judgment.

26 Within this Judgment, the following terms, words, phrases and clauses are used by the
27 Court with the following meanings:

28 “Adjudicated Storage Capacity” means 220,000 acre-feet of the Available Dewatered

1 Space which has been apportioned herein for Individual Storage Accounts and Community
2 Storage.

3 “Administrative Body” is defined in Section II(A).

4 “Administrative Year” means the twelve (12) month period beginning July 1 and ending
5 June 30.

6 “Allowed Pumping Allocation” is that quantity in acre feet which the Court adjudges to
7 be the maximum quantity which a party should be allowed to extract annually from Central
8 Basin as set forth in Part I hereof, which constitutes 80% of such party’s Total Water Right.

9 “Allowed Pumping Allocation for a particular Administrative Year” and “Allowed
10 Pumping Allocation in the following Administrative Year” and similar clauses, mean the
11 Allowed Pumping Allocation as increased in a particular Administrative Year by any authorized
12 carryovers pursuant to Section III(A) of this Judgment and as reduced by reason of any over-
13 extractions in a previous Administrative Year.

14 “Artificial Replenishment” is the replenishment of Central Basin achieved through the
15 spreading or injection of imported or recycled water for percolation thereof into Central Basin by
16 a governmental agency, including WRD.

17 “Artificial Replenishment Water” means water captured or procured by WRD to
18 replenish the Basin, either directly by percolating or injecting the water into the Basin, or
19 through in lieu replenishment by substituting surface water (or payment therefor) in lieu of
20 production and use of groundwater.

21 “Available Dewatered Space” means the total amount of space available to hold
22 groundwater within the Central Basin without causing Material Physical Harm, which space is
23 allocated between Adjudicated Storage Capacity and Basin Operating Reserve.

24 “Base Water Right” is the highest continuous extractions of water by a party from Central
25 Basin for a beneficial use in any period of five consecutive years after the commencement of
26 overdraft in Central Basin and prior to the commencement of this action, as to which there has
27 been no cessation of use by that party during any subsequent period of five consecutive years.
28 As employed in the above definition, the words “extractions of water by a party” and “cessation

of use by that party” include such extractions and cessations by any predecessor or predecessors in interest.

“Basin Operating Reserve” means a total of 110,000 acre feet of Available Dewatered Space available for Basin operations as provided in Section IV(L). The Basin Operating Reserve added to the Adjudicated Storage Capacity equals the amount of Available Dewatered Space.

“Calendar Year” is the twelve month period commencing January 1 of each year and ending December 31 of each year.

“Carryover” is defined in Section III(A).

“Carryover Conversion” means the process of transferring water properly held as Carryover into Stored Water, or the water so converted to Stored Water.

“Central Basin” is the underground basin or reservoir underlying the Central Basin Area, the exterior boundaries of which Central Basin are the same as the exterior boundaries of Central Basin Area.

“Central Basin Area” is the territory described in Appendix “1” to this Judgment and is a segment of the territory comprising Plaintiff District.

“Central Basin Water Rights Panel” means the constituent body of Watermaster consisting of seven (7) Parties elected from among parties holding Allowed Pumping Allocations as provided in Section II(B).

“CEQA” refers to the California Environmental Quality Act, Public Resources Code §§ 21000 *et seq.*

“Community Storage Pool” is defined in Section IV(E).

“Declared Water Emergency” means a period commencing with the adoption of a resolution of the Board of Directors of WRD declaring that conditions within the Central Basin relating to natural and imported supplies of water are such that, without implementation of the water emergency provisions of this Judgment, the water resources of the Central Basin risk degradation. Such Declaration may be made as provided in Section III(A)(3).

“Disadvantaged Community” means any area that is served by a Water Purveyor and that consists of one or more contiguous census tracts which, based upon the most-recent United

1 States Census data, demonstrates a median household income which is less than eighty percent
2 (80%) of the median household income for all Census Tracts within the state of California. The
3 identification of Disadvantaged Communities shall be made by Watermaster following each
4 decennial census.

5 “Extraction,” “extractions,” “extracting,” “extracted,” and other variations of the same
6 noun and verb, mean pumping, taking, diverting or withdrawing groundwater by any manner or
7 means whatsoever from Central Basin.

8 “Imported Water” means water brought into Central Basin Area from a non-tributary
9 source by a party and any predecessors in interest, either through purchase directly from
10 Metropolitan Water District of Southern California (“MWD”), the Central Basin Municipal
11 Water District (“CBMWD”), or any other MWD member agency and additionally, as to the
12 Department of Water and Power of the City of Los Angeles, water brought into the Central Basin
13 Area by that party by means of the Owens River Aqueduct. In the case of water imported for
14 storage by a party pursuant to this Judgment, “Imported Water” means water brought into the
15 Central Basin from any non-tributary source as one method for establishing storage in the
16 Central Basin.

17 “Imported Water Use Credit” is the annual amount, computed on a calendar year basis, of
18 Imported Water which any party and any predecessors in interest, who have timely made the
19 required filings under Water Code Section 1005.1, have imported into Central Basin Area in any
20 calendar year and subsequent to July 9, 1951, for beneficial use therein, but not exceeding the
21 amount by which that party and any predecessors in interest reduces his or their extractions of
22 groundwater from Central Basin in that calendar year from the level of his or their extractions in
23 the preceding calendar year, or in any prior calendar year not earlier than the calendar year 1950,
24 whichever is the greater.

25 “Individual Storage Allocation” is defined in Section IV(D).

26 “Majority Protest” means a written protest filed with the Administrative Body of
27 Watermaster within sixty (60) days following a protested event or decision, which evidences the
28 concurrence of a majority of the Allowed Pumping Allocations held within the Basin as of the

1 date thereof.

2 “Material Physical Harm” means material physical injury or a material diminution in the
3 quality or quantity of groundwater available within the Basin to support extraction of Total
4 Water Rights or Stored Water, that is demonstrated to be attributable to the placement, recharge,
5 injection, storage or recapture of Stored Water in the Central Basin, including, but not limited to,
6 degradation of water quality, liquefaction, land subsidence and other material physical injury
7 caused by elevated or lowered groundwater levels. Material Physical Harm does not include
8 “economic injury” that results from other than direct physical causes, including any adverse
9 effect on water rates, lease rates, or demand for water. Once fully mitigated, physical injury
10 shall no longer be considered to be material.

11 “Natural Replenishment” means and includes all processes other than “Artificial
12 Replenishment” by which water may become a part of the groundwater supply of Central Basin.

13 “Natural Safe Yield” is the maximum quantity of groundwater, not in excess of the long
14 term average annual quantity of Natural Replenishment, which may be extracted annually from
15 Central Basin without eventual depletion thereof or without otherwise causing eventual
16 permanent damage to Central Basin as a source of groundwater for beneficial use, said maximum
17 quantity being determined without reference to Artificial Replenishment.

18 “Outgoing Watermaster” is the State of California, Department of Water Resources, the
19 Watermaster appointed pursuant to the terms of the Judgment before this Third Amendment.

20 “Overdraft” is that condition of a groundwater basin resulting from extractions in any
21 given annual period or periods in excess of the long term average annual quantity of Natural
22 Replenishment, or in excess of that quantity which may be extracted annually without otherwise
23 causing eventual permanent damage to the basin.

24 “Party” means a party to this action. Whenever the term “party” is used in connection
25 with a quantitative water right, or any quantitative right, privilege or obligation, or in connection
26 with the assessment for the budget of the Watermaster, it shall be deemed to refer collectively to
27 those parties to whom are attributed a Total Water Right in Part I of this Judgment.

28 “Person” or “persons” include individuals, partnerships, associations, governmental

1 agencies and corporations, and any and all types of entities.

2 “Recycled Water” means water that has been reclaimed through treatment appropriate for
3 its intended use in compliance with applicable regulations.

4 “Regional Disadvantaged Communities Incentive Program” means a program to be
5 developed by Watermaster in the manner provided in Section II(H) of this Judgment, and
6 approved by the Court, whereby a portion of the Community Storage Pool is made available to
7 or for the benefit of Disadvantaged Communities, on a priority basis within the Central Basin.

8 “Replenishment Assessment” means the replenishment assessment imposed by WRD
9 upon each acre-foot of groundwater extracted from the Central Basin pursuant to WRD’s
10 enabling act, California Water Code §§ 60000 et seq.

11 “Small Water Producers Group” means a body consisting of parties holding no greater
12 than 5,000 acre-feet of Allowed Pumping Allocation, as set forth on Appendix 3 hereto and as
13 may be modified from time to time by the Group’s own procedures and the requirements set
14 forth in Appendix 3.

15 “Storage Panel” or “Central Basin Storage Panel” means a bicameral constituent body of
16 Watermaster consisting of (i) the Central Basin Water Rights Panel and (ii) the Board of
17 Directors of WRD.

18 “Storage Project” means an activity pertaining to the placement, recharge, injection,
19 storage, transfer, or recapture of Stored Water within the Basin, but does not include actions by
20 WRD undertaken in connection with its replenishment activities.

21 “Stored Water” means water, including Recycled Water, held within Available
22 Dewatered Space as a result of spreading, injection, in-lieu delivery, or Carryover Conversion,
23 where there is an intention to subsequently withdraw the water for reasonable and beneficial use
24 pursuant to this Judgment.

25 “Total Water Right” is the quantity arrived at in the same manner as in the computation
26 of “Base Water Right,” but including as if extracted in any particular year the Imported Water
27 Use Credit, if any, to which a particular party may be entitled.

28 “Water” includes only non-saline water, which is that having less than 1,000 parts of

1 chlorides to 1,000,000 parts of water.

2 “Water Augmentation Project” means pre-approved physical actions and management
3 activities that provide demonstrated appreciable increases in long-term annual groundwater yield
4 in the Basin that are initiated as provided in this Judgment after January 1, 2013.

5 “Water Purveyor” means a Party (and successors in interest) which sells water to the
6 public, whether a regulated public utility, mutual water company or public entity. As that term is
7 used in Section III(B)(6), “Water Purveyor,” in addition to the foregoing, means a Party which
8 has a connection or connections for the taking of Imported Water through the Metropolitan
9 Water District of Southern California (“MWD”), or through a MWD-member agency, or access
10 to such Imported Water through such connection, and which normally supplies at least a part of
11 its customers’ water needs with such Imported Water.

12 “Watermaster” is defined in Part II and is comprised of (i) the Administrative Body, (ii)
13 the Central Basin Water Rights Panel, and (iii) the Central Basin Storage Panel. Watermaster,
14 and the various constituent bodies of Watermaster, as designated in this Judgment, exist as a
15 special master pursuant to this Judgment and Watermaster serves at the pleasure of the Court.
16 Nothing herein shall be construed as creating an independent designation of “Watermaster” as a
17 public agency subject to the provisions of CEQA, nor does membership or participation as the
18 designated Watermaster expand any statutory, constitutional, or other powers of the members
19 serving as part of the Watermaster.

20 “West Coast Basin” is the groundwater basin adjacent to the Central Basin which is the
21 subject of a separate adjudication of groundwater rights in *California Water Service Company, et*
22 *al. v. City of Compton, et al.*, Los Angeles Superior Court Case No. 506806.

23 “WRD” or “Water Replenishment District” is the plaintiff herein, the Water
24 Replenishment District of Southern California, a special district of the State of California, which
25 brought this action under its former name, “Central and West Basin Water Replenishment
26 District.”

27 In those instances where any of the above-defined words, terms, phrases or clauses are
28 utilized in the definition of any of the other above-defined words, terms, phrases and clauses,

1 such use is with the same meaning as is above set forth.

2
3 NOW THEREFORE, IT IS ORDERED, DECLARED, ADJUDGED AND DECREED
4 WITH RESPECT TO THE ACTION AND CROSS-ACTION AS FOLLOWS:

5
6 I. DECLARATION AND DETERMINATION OF WATER RIGHTS OF
7 PARTIES; RESTRICTION ON THE EXERCISE THEREOF.¹

8 A. Determination of Rights of Parties.

9 (1) Each party, except defendants The City of Los Angeles and
10 Department of Water and Power of the City of Los Angeles, whose name is set
11 forth in Appendix 2 and by this reference made a part hereof, and after whose
12 name there appears under the column "Total Water Right" a figure other than "0,"
13 is the owner of and has the right to extract annually groundwater from Central
14 Basin for beneficial use in the quantity set forth after that party's name under said
15 column "Total Water Right" as of the close of the Administrative Year ending
16 June 30, 2012 in accordance with the Watermaster Reports on file with this Court
17 and the records of the Plaintiff. This tabulation does not take into account
18 additions or subtractions from any Allowed Pumping Allocation of a producer for
19 the 2012-2013 Administrative Year, nor other adjustments not representing
20 change in fee title to water rights, such as leases of water rights, nor does it
21 include the names of lessees of landowners where the lessees are exercising the
22 water rights. The exercise of all water rights is subject, however, to the
23 provisions of this Judgment as hereinafter contained. All of said rights are of the
24 same legal force and effect and are without priority with reference to each other.
25 Each party whose name is set forth in the tabulation in Appendix "2" of this

26
27 ¹ Headings in the Judgment are for purposes of reference and the language of said headings do not constitute, other
28 than for such purpose, a portion of this Judgment.

1 Judgment, and after whose name there appears under the column “Total Water
2 Right” the figure “0,” owns no rights to extract any groundwater from Central
3 Basin, and has no right to extract any groundwater from Central Basin.

4 (2) Defendant The City of Los Angeles is the owner of the right to
5 extract fifteen thousand (15,000) acre feet per annum of groundwater from
6 Central Basin, but it has the right and ability to purchase or lease additional rights
7 to extract groundwater and increase its Allowed Pumping Allocation. Defendant
8 Department of Water and Power of the City of Los Angeles has no right to extract
9 groundwater from Central Basin except insofar as it has the right, power, duty or
10 obligation on behalf of defendant The City of Los Angeles to exercise the water
11 rights in Central Basin of defendant The City of Los Angeles. The exercise of
12 said rights is subject, however, to the provisions of this Judgment hereafter
13 contained, including but not limited to, sharing with other parties in any
14 subsequent decreases or increases in the quantity of extractions permitted from
15 Central Basin, pursuant to continuing jurisdiction of the Court, on the basis that
16 fifteen thousand (15,000) acre feet (and any increase in its Allowed Pumping
17 Allocation) bears to the Allowed Pumping Allocations of the other parties.

18 (3) No party to this action is the owner of or has any right to extract
19 groundwater from Central Basin except as herein affirmatively determined.

20 B. Parties Enjoined as to Quantities of Extractions.

21 (1) Each party, other than The State of California and The City of Los
22 Angeles and Department of Water and Power of The City of Los Angeles, is
23 enjoined and restrained in any Administrative Year commencing after the date
24 this Judgment becomes final from extracting from Central Basin any quantity of
25 Water greater than the party’s Allowed Pumping Allocation as hereinafter set
26 forth next to the name of the party in the tabulation appearing in Appendix 2 at
27 the end of this Judgment, subject to further provisions of this Judgment. Subject
28 to such further provisions, the officials, agents and employees of The State of

1 California are enjoined and restrained in any such Administrative Year from
2 extracting from Central Basin collectively any quantity of water greater than the
3 Allowed Pumping Allocation of The State of California as hereinafter set forth
4 next to the name of that party in the same tabulation. Each party adjudged and
5 declared above not to be the owner of and not to have the right to extract
6 groundwater from Central Basin is enjoined and restrained in any Administrative
7 Year commencing after the date this Judgment becomes final from extracting any
8 groundwater from Central Basin, except as may be hereinafter permitted to any
9 such party under this Judgment.

10 (2) The total extraction right for each party includes a party's Allowed
11 Pumping Allocation (to the extent not transferred by agreement or otherwise), any
12 contractual right acquired through lease or other agreement to extract or use the
13 rights of another party, and any right to extract Stored Water or Carryover as
14 provided in this Judgment. No party may extract in excess of 140% of the sum of
15 (i) the party's Allowed Pumping Allocation and (ii) the party's leased water,
16 except upon prior approval by the applicable body of Watermaster as required
17 pursuant to Section IV(J) as provided herein. Upon application, the body specified
18 in Section IV(J) shall approve a party's request to extract water in excess of such
19 limit, provided there is no Material Physical Harm. Requests to extract water in
20 excess of such limit shall be reviewed and either approved or denied within thirty
21 (30) days of such request.

22 (3) Defendant The City of Los Angeles is enjoined and restrained in
23 any Administrative Year commencing after the date this Judgment becomes final
24 from extracting from Central Basin any quantity of water greater than fifteen
25 thousand (15,000) acre feet or its Allowed Pumping Allocation, as recognized by
26 the Watermaster, if it acquires additional rights to pump groundwater through
27 purchase or lease, subject to further provisions of this Judgment, including but not
28 limited to, sharing with other parties in any subsequent decreases or increases in

1 the quantity of extractions permitted from Central Basin by parties, pursuant to
2 continuing jurisdiction of the Court, on the basis that fifteen thousand (15,000)
3 acre feet (or the adjusted Allowed Pumping Allocation if additional rights are
4 acquired) bears to the Allowed Pumping Allocations of the other parties.
5 Defendant Department of Water and Power of The City of Los Angeles is
6 enjoined and restrained in any Administrative Year commencing after the date
7 this Judgment becomes final from extracting from Central Basin any quantity of
8 water other than such as it may extract on behalf of defendant The City of Los
9 Angeles, and which extractions, along with any extractions by said City, shall not
10 exceed that quantity permitted by this Judgment to that City in any Administrative
11 Year. Whenever in this Judgment the term "Allowed Pumping Allocation"
12 appears, it shall be deemed to mean as to defendant The City of Los Angeles the
13 quantity of fifteen thousand (15,000) acre feet unless the City of Los Angeles has
14 acquired through purchase or lease right to extract additional groundwater. The
15 limit on extraction as provided in the preceding Section I(B)(1) shall also apply to
16 The City of Los Angeles.

17 (4) Any rights decreed and adjudicated herein may be transferred,
18 assigned, licensed or leased by the owner thereof provided, however, that no such
19 transfer shall be complete until compliance with the appropriate notice procedures
20 established by Watermaster.

21 (5) Unless a party elects otherwise, production of water from the Basin
22 for the use or benefit of the parties hereto shall be counted against the party's total
23 extraction right in the following order: (i) Increased extractions by certain
24 qualified water rights holders pursuant to Section IV(K), (ii) Exchange Pool
25 production, (iii) production of Carryover water, (iv) production of leased water, ,
26 (v) production of Allowed Pumping Allocation, (vi) production of Stored Water,
27 (vii) production of Drought Carryover (according to Watermaster's Rules), and
28 (viii) production of water under an agreement with WRD during a period of

1 emergency pursuant to Section III(B)(6).

2 C. Parties Enjoined as to Export of Extractions.

3 Except as expressly authorized herein, or upon further order of the Court, all
4 parties are enjoined and restrained from transporting water extracted from the Central
5 Basin outside the boundaries of the Central Basin Area. For purposes of this Section,
6 water supplied by a Water Purveyor to its customers located within any of its service
7 areas contiguous to the Central Basin or within WRD's service area shall be exempt from
8 the export prohibition of this Section provided that the Water Purveyor also provides
9 water to a service area that overlies the Basin in whole or in part. The foregoing
10 exemption is not made, nor is it related to, a determination of an underflow between the
11 basins, a cost or benefit allocation, or any other factor relating to the allocation of the
12 Replenishment Assessment by WRD. Further, this injunction and restriction does not
13 apply to export of water that will take place pursuant to contractual obligations
14 specifically identified on Appendix 4, nor does it apply to export of Stored Water not
15 having its origin in Carryover Conversion. The export identified on Appendix 4 may
16 continue to the extent that any such extraction does not violate any other provisions of
17 this Judgment, provided however that no such export identified on Appendix 4 shall
18 exceed 5,000 acre-feet in any Year.

19
20 II. APPOINTMENT OF WATERMASTER; WATERMASTER ADMINISTRATION
21 PROVISIONS.

22 The particular bodies specified below are, jointly, hereby appointed Watermaster,
23 for an indefinite term, but subject to removal by the Court, to administer this Judgment. Such
24 bodies, which together shall constitute the "Watermaster," shall have restricted powers, duties
25 and responsibilities as specified herein, it being the court's intention that particular constituent
26 bodies of Watermaster have only limited and specified powers over certain aspects of the
27 administration of this Judgment. The Outgoing Watermaster will exercise reasonable diligence
28 in the complete transition of Watermaster duties and responsibilities within a reasonable time

1 following entry of this order, and to make available to the new Watermaster all records
2 concerning Watermaster activities. The chair of the Central Basin Water Rights Panel (defined
3 below) shall thereafter represent the Watermaster before the Court.

4 A. The Administrative Body.

5 Plaintiff Water Replenishment District of Southern California (“WRD”) is
6 appointed the Administrative Body of the Central Basin Watermaster (“Administrative
7 Body”). In order to assist the Court in the administration of the provisions of this
8 Judgment and to keep the Water Rights Panel and the Court fully advised in the
9 premises, the Administrative Body shall have the following duties, powers and
10 responsibilities:

11 (1) To Require Reports, Information and Records.

12 In consultation with the Water Rights Panel, the Administrative Body
13 shall require the parties to furnish such reports, information and records as may be
14 reasonably necessary to determine compliance or lack of compliance by any party
15 with the provisions of this Judgment.

16 (2) Storage Projects.

17 The Administrative Body shall exercise such powers as may be
18 specifically granted to it under this Judgment with regard to Stored Water.

19 (3) Annual Report.

20 The Administrative Body shall prepare, on or before the 15th day of the
21 fourth month following the end of the preceding Administrative Year, an annual
22 report for the consideration of the Water Rights Panel. The Chair of the Water
23 Rights Panel shall submit to the Court either (1) the annual report prepared by the
24 Administrative Body, following the adoption by the Water Rights Panel, or (2) an
25 annual report separately prepared and adopted by the Water Rights Panel. The
26 annual report prepared by the Administrative Body shall be limited to the
27 following, unless otherwise required by the Court:

28 (a) Groundwater extractions

- 1 (b) Storage Accounts maintained by each party
2 (c) Status of the Regional Disadvantaged Community
3 Incentive Program, if approved by the Court
4 (d) Exchange Pool operation
5 (e) Use of Imported Water
6 (f) Violations of this Judgment and corrective action taken by
7 bodies of Watermaster having jurisdiction as provided in this
8 Judgment
9 (g) Change of ownership of Total Water Rights
10 (h) Watermaster administration costs
11 (i) Water spread or imported into the Basin
12 (j) Water Augmentation Projects
13 (k) Whether the Administrative Body has become aware of the
14 development of a Material Physical Harm, or imminent threat of the
15 development of a Material Physical Harm, as required pursuant to
16 Section IV(B) of this Judgment
17 (l) Other matters as agreed with the Water Rights Panel
18 (m) Recommendations, if any.

19 In consultation with the Water Rights Panel, the Administrative Body shall
20 provide reasonable notice to all parties of all material actions or determinations by
21 Watermaster or any constituent body thereof, and as otherwise provided by this
22 Third Amended Judgment.

23 (4) Annual Budget and Appeal Procedure in Relation Thereto.

24 By April 1 of each Administrative Year, the Administrative Body shall
25 prepare a proposed administrative budget for the subsequent year stating the
26 anticipated expense for performing the administrative functions specified in this
27 Judgment (the “Administrative Budget”). The Administrative Body shall mail a
28 copy of the proposed Administrative Budget to each of the Parties at least 60 days

1 before the beginning of each Administrative Year. The Administrative Budget
2 mailed to the Parties shall provide sufficient detail in the Administrative Budget
3 to demonstrate a separation in accounting between the Administrative Budget and
4 WRD's Replenishment Assessment and operating budget. For the first
5 Administrative Year of operation under this Third Amended Judgment, if the
6 Administrative Body is unable to meet the above time requirement, the
7 Administrative Body shall mail said copies as soon as possible. The first year the
8 Administrative Budget is prepared, the amount of that budget shall not exceed an
9 amount equal to fifty percent (50%) of the 2012-2013 charge for Watermaster
10 service for the Central Basin collected from Parties by the California Department
11 of Water Resources. At all times, the Administrative Body shall maintain a
12 separation in accounting between the Administrative Budget and WRD's
13 Replenishment Assessment and operating budget. All increases in future budgets
14 for the Administrative Body above the amount set forth above shall be subject to
15 approval by the Water Rights Panel following a public meeting to be held prior to
16 the beginning of the Administrative Year, provided that the approved budget shall
17 not be less than the amount of the first-year budget for the Administrative Body,
18 except upon further order of the Court. Any administrative function by WRD
19 already paid for by the Replenishment Assessment shall not be added as an
20 expense in the Administrative Budget. Similarly, any expense paid for by the
21 Administrative Budget shall not be added to WRD's operating budget, or
22 otherwise added to the calculation of the Replenishment Assessment. While WRD
23 may approve the proposed Administrative Budget at the same meeting in which
24 WRD adopts its annual Replenishment Assessment or annual budget, the
25 Administrative Body's budget shall be separate and distinct from the
26 Replenishment Assessment imposed pursuant to Water Code §60317 and WRD's
27 operating budget.

28 If approval by the Water Rights Panel is required pursuant to the

1 foregoing, the Water Rights Panel shall act upon the proposed budget within 15
2 calendar days after the public meeting. If the Water Rights Panel does not
3 approve the budget prior to such deadline, the matter may be appealed to the
4 Court within sixty (60) days. If any Party hereto has any objection to the
5 Administrative Budget, it shall present the same in writing to Watermaster within
6 15 days after the date of mailing of said tentative budget by the Administrative
7 Body. The Parties shall make the payments otherwise required of them to the
8 Administrative Body even though an appeal of such budget may be pending.
9 Upon any revision by the Court, the Administrative Body shall either remit to the
10 Parties their pro rata portions of any reduction in the budget, or shall credit their
11 accounts with respect to their budget assessments for the next ensuing
12 Administrative Year, as the Court shall direct.

13 The amount of the Administrative Budget to be assessed to each party
14 shall be determined as follows: If that portion of the final budget to be assessed to
15 the Parties is equal to or less than \$20.00 per party then the cost shall be equally
16 apportioned among the Parties. If that portion of the final budget to be assessed to
17 Parties is greater than \$20.00 per party then each Party shall be assessed a
18 minimum of \$20.00. The amount of revenue expected to be received through the
19 foregoing minimum assessments shall be deducted from that portion of the final
20 budget to be assessed to the Parties and the balance shall be assessed to the Parties
21 having Allowed Pumping Allocation, such balance being divided among them
22 proportionately in accordance with their respective Allowed Pumping Allocation.

23 Payment of the assessment provided for herein, subject to adjustment by
24 the Court as provided, shall be made by each such party prior to beginning of the
25 Administrative Year to which the assessment relates, or within 40 days after the
26 mailing of the tentative budget, whichever is later. If such payment by any Party
27 is not made on or before said date, the Administrative Body shall add a penalty of
28 5% thereof to such party's statement. Payment required of any Party hereunder

1 may be enforced by execution issued out of the Court, or as may be provided by
2 order hereinafter made by the Court, or by other proceedings by the Watermaster
3 or by any Party on the Watermaster's behalf.

4 Any money unexpended at the end of any Administrative Year shall be
5 applied to the budget of the next succeeding Administrative Year. The
6 Administrative Body shall maintain no reserves.

7 Notwithstanding the above, no part of the budget of the Administrative
8 Body shall be assessed to WRD or to any Party who has not extracted water from
9 Central Basin for a period of two successive Administrative Years prior to the
10 Administrative Year in which the tentative budget should be mailed by the
11 Administrative Body under the provisions of this subparagraph (4).

12 (5) Rules.

13 The Administrative Body may adopt, and amend from time to time, rules
14 consistent with this Judgment as may be reasonably necessary to carry out duties
15 under the provisions of this Judgment within its particular area of responsibility.
16 The Body shall adopt its first set of rules and procedures within three (3) months
17 following entry of this Third Amended Judgment. The rules shall be effective on
18 such date after the mailing thereof to the Parties as is specified by the Body, but
19 not sooner than thirty (30) days after such mailing.

20 B. The Central Basin Water Rights Panel.

21 The Central Basin Water Rights Panel of the Central Basin Watermaster ("Water Rights
22 Panel") shall consist of seven (7) members, each of which is a Party. The term of each member
23 of the Panel, with the exception of the seat held by the Small Water Producers Group, as
24 provided herein, shall be limited to four years. The Court will make the initial appointments to
25 the Central Basin Water Rights Panel upon motion by Parties consistent with the categories set
26 forth below at or about the time of entry of this Third Amended Judgment, and shall establish a
27 procedure for the staggered terms of such members. Thereafter, elections of members of the
28 Panel shall be held as provided herein. One (1) such member of the Water Rights Panel shall be

1 elected by vote of the Small Water Producers Group conducted in accordance with its own
2 procedures, provided such Group, as of the date of the election, consists of at least five (5)
3 members who are Water Purveyors. One (1) such member of the Water Rights Panel shall be
4 elected by vote of Parties with Allowed Pumping Allocation of less than 5,000 acre-feet who are
5 not members of the Small Water Producers Group or, if the Small Water Producers Group does
6 not then qualify following a continuous six-month period of non-qualification as provided
7 herein, then two (2) such members shall be so selected. One (1) such member of the Water
8 Rights Panel shall be elected by vote of Parties with Allowed Pumping Allocation of at least
9 5,000 acre-feet but less than 10,000 acre-feet. Three (3) such members of the Water Rights
10 Panel shall be elected by vote of Parties with Allowed Pumping Allocation of 10,000 acre-feet or
11 greater. One (1) such member of the Water Rights Panel shall be elected by a vote of all holders
12 of Allowed Pumping Allocations, with each such holder being entitled to one vote, such member
13 to be elected by a plurality of the votes cast, following a nomination procedure to be established
14 in the Water Rights Panel's rules. In the event of a tie, the seventh member shall be determined
15 as may be provided in the Water Rights Panel's rules, or otherwise by the court. Except as
16 otherwise provided in this Section, each such rights holder shall have the right to cast a total
17 number of votes equal to the number of acre-feet of its Allowed Pumping Allocation (rounded to
18 the next highest whole number). With the exception of voting for the seventh member, Parties
19 shall be entitled to vote only for candidates within the category(ies) that represent that Party's
20 Allowed Pumping Allocation. For example, parties who are members of the Small Water
21 Producers Group are entitled to vote only for the Small Water Producer Group member and the
22 seventh member of the Water Rights Panel, and so on. Parties are not permitted to split votes.
23 The results of such election shall be reported to the Court for confirmation of each member's
24 appointment to the Water Rights Panel of Watermaster. The elected members of the Water
25 Rights Panel shall be those candidates receiving the highest vote total in their respective
26 categories. The Water Rights Panel shall hold its first meeting within thirty (30) days of the date
27 this Third Amended Judgment becomes final. The Water Rights Panel shall develop rules for its
28 operation consistent with this Judgment. The Water Rights Panel shall take action, including the

1 election of its Chair, by majority vote of its members. Election of the Chair shall occur every
2 two years, with no Party serving as Chair for consecutive terms. Members of the Water Rights
3 Panel shall serve without compensation. All references to Annual Pumping Allocation, as used
4 herein, are as determined by the last published Watermaster report.

5 (1) The Water Rights Panel shall have the following duties and
6 responsibilities:

7 (a) Enforcement of Adjudicated Rights. As against the other
8 bodies of Watermaster, the Water Rights Panel shall have exclusive
9 authority to move the Court to take such action as may be necessary to
10 enforce the terms of the Judgment with regard to the extraction of
11 Allowed Pumping Allocation and the maintenance of adjudicated
12 groundwater extraction rights as provided in this Judgment.

13 (b) Requirement of Measuring Devices. The Water Rights
14 Panel shall require all parties owning or operating any facilities for the
15 extraction of groundwater from Central Basin to install and maintain at
16 all times in good working order at such party's own expense,
17 appropriate measuring devices at such times and as often as may be
18 reasonable under the circumstances and to calibrate or test such
19 devices.

20 (c) Inspections by Watermaster. The Water Rights Panel may
21 make inspections of groundwater production facilities, including
22 aquifer storage and recovery facilities, and measuring devices at such
23 times and as often as may be reasonable under the circumstances and
24 to calibrate or test such devices.

25 (d) Reports. Annually, the Water Rights Panel, in cooperation
26 with the Administrative Body, shall report to the Court, concerning
27 any or all of the following:

28 (i) Groundwater extractions

- (ii) Exchange Pool operation
- (iii) Status of the Regional Disadvantaged Community Incentive Program, if approved by the Court
- (iv) Violations of this Judgment and corrective action taken or sought
- (v) Change of ownership of Total Water Rights
- (vi) Assessments made by the Water Rights Panel and any costs incurred
- (vii) Whether the Water Rights Panel has become aware of the development of a Material Physical Harm, or imminent threat of the development of a Material Physical Harm, as required pursuant to Section IV(B) of this Judgment
- (viii) Recommendations, if any.

As provided in Section II.A(3), the Water Rights Panel may adopt the annual report prepared by the Administrative Body, and submit the same to the Court, or the Water Rights Panel may prepare, adopt and submit to the Court a separate report. The Chair of the Water Rights Panel shall be responsible for reporting to the Court concerning adjudicated water rights issues in the Basin.

(2) Assessment. The Water Rights Panel shall assess holders of water rights within the Central Basin an annual amount not to exceed \$1.00 per acre-foot of Allowed Pumping Allocation, by majority vote of the members of the Water Rights Panel. The body may assess a higher amount, subject to being overruled by Majority Protest. The assessment is intended to cover any costs associated with reporting responsibilities, any Judgment enforcement action, and the review of storage projects as a component of the “Storage Panel” as provided below. It is anticipated that this body will rely on the Administrative Body’s staff for the functions related to the Administrative Body’s responsibilities, but the

1 Water Rights Panel may engage its own staff if required in its reasonable
2 judgment. Assessments will constitute a lien on the water right assessed,
3 enforceable as provided in this Judgment.

4 (3) Rules. The Water Rights Panel may adopt and amend from time to
5 time, at an open meeting of that Panel, rules consistent with this Judgment as may
6 be reasonably necessary to carry out duties under the provisions of this Judgment
7 within its particular area of responsibility. The Panel shall adopt its first set of
8 rules and procedures within three (3) months following entry of this Third
9 Amended Judgment. The rules shall be effective on such date after the mailing
10 thereof to the Parties as is specified by the Panel, but not sooner than thirty (30)
11 days after such mailing.

12 C. The Storage Panel.

13 The Storage Panel of the Central Basin Watermaster (“Storage Panel”) shall be a
14 bicameral body consisting of (i) the Water Rights Panel and (ii) the Board of Directors of
15 WRD. Action by the Storage Panel shall require separate action by a majority of each of
16 its constituent bodies. The Storage Panel shall have the duties and responsibilities
17 specified with regard to the Provisions for the Storage and Extraction of Stored
18 Groundwater as set forth in Part IV and the other provisions of this Judgment.

19 D. Use of Facilities and Data Collected by Other Governmental Agencies.

20 Where practicable, the three bodies constituting the Central Basin Watermaster
21 should not duplicate the collection of data relative to conditions of the Central Basin
22 which is then being collected by one or more governmental agencies, but where
23 necessary each such body may collect supplemental data. Where it appears more
24 economical to do so, the Watermaster and its constituent bodies are directed to use such
25 facilities of other governmental agencies as are available to it under either no cost or cost
26 agreements with respect to the receipt of reports, billings to parties, mailings to parties,
27 and similar matters.

28 E. Appeal from Watermaster Decisions.

1 Appeals concerning the budget proposed by the Administrative Body shall be
2 governed by Section II(A)(4) of this Judgment. Appeals concerning decisions by the
3 Storage Panel shall be governed by Section IV(P) of this Judgment. With respect to all
4 other objections by a Party to any action or decision by the Watermaster, such objections
5 will be governed by this Section II(E). Any party interested therein who objects to any
6 rule, determination, order or finding made by the Watermaster or any constituent body
7 thereof, may object thereto in writing delivered to the Administrative Body within 30
8 days after the date the Watermaster, or any constituent body thereof, mails written notice
9 of the making of such rule, determination, order or finding. Within 30 days after such
10 delivery the Watermaster, or the affected constituent body thereof, shall consider said
11 objection and shall amend or affirm his rule, determination, order or finding and shall
12 give notice thereof to all parties. Any such party may file with the Court within 60 days
13 from the date of said notice any objection to such rule, determination, order or finding of
14 the Watermaster, or any constituent body thereof, and bring the same on for hearing
15 before the Court at such time as the Court may direct, after first having served said
16 objection upon all other parties. The Court may affirm, modify, amend or overrule any
17 such rule, determination, order or finding of the Watermaster or its affected constituent
18 body. Any objection under this paragraph shall not stay the rule, determination, order or
19 finding of the Watermaster. However, the Court, by *ex parte* order, may provide for a
20 stay thereof on application of any interested party on or after the date that any such party
21 delivers to the Watermaster any written objection.

22 F. Effect of Non-Compliance by Watermaster With Time Provisions.

23 Failure of the Watermaster to perform any duty, power or responsibility set forth
24 in this Judgment within the time limitation herein set forth shall not deprive the
25 Watermaster or its applicable constituent body of authority to subsequently discharge
26 such duty, power or responsibility, except to the extent that any such failure by the
27 Watermaster may have rendered some otherwise required act by a party impossible.

28 G. Limitations on Administrative Body.

1 WRD shall not acquire Central Basin water rights, nor lease Central Basin water
2 or water rights to or from any Party or third party. However, the foregoing shall (i) not be
3 interpreted to restrict WRD's ability or authority to acquire water from any source for
4 purposes of Artificial or Natural Replenishment or for water quality activities, and (ii)
5 not restrict WRD's authority under California Water Code Section 60000 et seq. to
6 develop reclaimed, recycled or remediated water for groundwater replenishment
7 activities.

8 H. Regional Disadvantaged Communities Incentive Program.

9 The Water Rights Panel, acting through the General Manager of WRD, shall
10 develop a Regional Disadvantaged Communities Incentive Program, pursuant to which a
11 portion of the Community Storage Pool is reserved for the benefit of Disadvantaged
12 Communities within the Central Basin. Nothing in this Judgment, nor the establishment
13 of such a program, shall diminish the rights otherwise granted to Parties under this
14 Judgment, including but not limited to the right to place water in storage in the
15 Community Storage Pool. The Water Rights Panel shall meet within thirty (30) days of
16 its formation to identify and consider potential third-party independent consultants who
17 may be retained to design the program, including those recommended by the General
18 Manager of WRD. The Water Rights Panel shall select a consultant within thirty (30)
19 days thereafter. In the event the General Manager of WRD objects to the selected
20 consultant, in writing, then the Water Rights Panel and the General Manager of WRD
21 shall exchange a list of no more than two (2) consultants each for further consideration.
22 If the Water Rights Panel and the General Manager of WRD are unable to agree to a
23 consultant within an additional thirty (30) days, then the Chair of the Water Rights Panel
24 shall file a request with the Court for an order appointing a consultant. Upon selection of
25 a third-party independent consultant, whether through the Water Rights Panel process or
26 the court process identified herein, the consultant shall design a detailed program and
27 deliver it to the Water Rights Panel within ninety (90) days of the consultant's retention.
28 All costs associated with design of the program shall be paid for out of the Water Rights

1 Panel's assessment, as provided in Section II.B(2). The Water Rights Panel shall present
2 the program to the Court for its review and approval within one year of entry of this
3 Third Amended Judgment. If approved by the Court, the Water Rights Panel, acting
4 through the General Manager of WRD, shall be responsible for administration of the
5 Regional Disadvantaged Communities Incentive Program, including insuring that any
6 funds generated through the program benefit Disadvantaged Communities. Any Storage
7 Project established pursuant to this Program shall have priority to use up to 23,000 acre-
8 feet of Available Storage within the Community Storage Pool, as further provided in
9 Section IV.E(2). Watermaster shall report to the Court concerning such program as a
10 part of its annual report.
11

12 III. PROVISIONS FOR PHYSICAL SOLUTION TO MEET THE WATER
13 REQUIREMENTS IN CENTRAL BASIN.

14 In order to provide flexibility to the injunction set forth in Part I of the Judgment, and to
15 assist in a physical solution to meet water requirements in Central Basin, the injunction so set
16 forth is subject to the following provisions.

17 A. Carryover of Portion of Allowed Pumping Allocation.

18 (1) Amount of Carryover.

19 Each party adjudged to have a Total Water Right or water rights and who,
20 during a particular Administrative Year, does not extract from Central Basin a
21 total quantity equal to such party's Allowed Pumping Allocation for the particular
22 Administrative Year, less any allocated subscriptions by such party to the
23 Exchange Pool, or plus any allocated requests by such party for purchase of
24 Exchange Pool water, is permitted to carry over (the "One Year Carryover") from
25 such Administrative Year the right to extract from Central Basin in the next
26 succeeding Administrative Year so much of said total quantity as it did not extract
27 in the particular Administrative Year, not to exceed (i) the Applicable Percentage
28 of such party's Allowed Pumping Allocation for the particular Administrative

1 Year, or 20 acre-feet, whichever of said percentage or 20 acre-feet is the larger,
2 less (ii) the total quantity of water then held in that party's combined Individual
3 and Community Storage accounts, as hereinafter defined, but in no event less than
4 20% of the party's Allowed Pumping Allocation for the particular Administrative
5 Year. For purposes of this Section, the "Applicable Percentage" shall be as
6 follows for the years indicated:

7
8 For the Administrative Year in which this
9 Third Amended Judgment becomes final: 30%
10 For the next Administrative Year: 40%
11 For the next Administrative Year: 50%
12 For the next Administrative Year and years
13 following: 60%

14 (2) Conversion of Carryover to Stored Water.

15 A party having Carryover may, from time to time, elect to convert all or
16 part of such party's Carryover to Stored Water as authorized herein ("Carryover
17 Conversion") upon payment of the Replenishment Assessment to WRD. Such
18 Stored Water shall be assigned to that party's Individual Storage Allocation, if
19 available, and otherwise to the Community Storage Pool.

20 (3) Declared Water Emergency.

21 The Board of Directors of WRD may, from time to time, declare a water
22 emergency upon a determination that conditions within the Central Basin relating
23 to natural and imported water supplies are such that, without implementation of
24 the Declared Water Emergency provisions of this subsection, the water resources
25 of the Central Basin risk degradation. In making such declaration, the Board of
26 Directors shall consider any information and requests provided by water
27 producers, purveyors and other affected entities and shall, for that purpose, hold a
28 public hearing in advance of such declaration. A Declared Water Emergency

1 shall extend to the end of the Administrative Year during which such resolution is
2 adopted, unless sooner ended by similar resolution.

3 (4) Drought Carryover.

4 Following the declaration of a Declared Water Emergency and until the
5 Declared Water Emergency ends either by expiration or by resolution of the
6 Board of Directors of WRD, each party adjudged to have a Total Water Right or
7 water rights and who, during a particular Administrative Year, does not extract
8 from Central Basin a total quantity equal to such party's Allowed Pumping
9 Allocation for the particular Administrative Year, less any allocated subscriptions
10 by such party to the Exchange Pool, or plus any allocated requests by such party
11 for purchase of Exchange Pool water, is permitted to carry over (the "Drought
12 Carryover") from such Administrative Year the right to extract from Central
13 Basin so much of said total quantity as it did not extract during the period of the
14 Declared Water Emergency, to the extent such quantity exceeds the One Year
15 Carryover, not to exceed an additional 35% of such party's Allowed Pumping
16 Allocation, or additional 35 acre feet, whichever of said 35% or 35 acre feet is the
17 larger, less the amount of such party's Stored Water. Carryover amounts shall
18 first be allocated to the One Year Carryover and any remaining carryover amount
19 for that year shall be allocated to the Drought Carryover.

20 (5) Accumulated Drought Carryover.

21 No further amounts shall be added to the Drought Carryover following the
22 end of the Declared Water Emergency, provided however that in the event
23 another Declared Water Emergency is declared, additional Drought Carryover
24 may be added, to the extent such additional Drought Carryover would not cause
25 the total Drought Carryover to exceed the limits set forth above. The Drought
26 Carryover shall be supplemental to and shall not affect any previous drought
27 carryover acquired by a party pursuant to previous order of the court.

28 B. When Over-Extractions May be Permitted.

1 (1) Underestimation of Requirements for Water.

2 Any party hereto without Stored Water, having an Allowed Pumping
3 Allocation, and not in violation of any provision of this Judgment may extract in
4 an Administrative Year an additional quantity of water not to exceed: (a) 20% of
5 such party's Allowed Pumping Allocation or 20 acre feet, whichever is greater,
6 and (b) any amount in addition thereto which may be approved in advance by the
7 Water Rights Panel of Watermaster.

8 (2) Reductions in Allowed Pumping Allocations in Succeeding Years
9 to Compensate for Permissible Overextractions.

10 Any such party's Allowed Pumping Allocation for the following
11 Administrative Year shall be reduced by the amount over-extracted pursuant to
12 paragraph 1 above, provided that if the Water Rights Panel determines that such
13 reduction in the party's Allowed Pumping Allocation in one Administrative Year
14 will impose upon such a party an unreasonable hardship, the said reduction in said
15 party's Allowed Pumping Allocation shall be prorated over a period of five (5)
16 Administrative Years succeeding that in which the excessive extractions by the
17 party occurred. Application for such relief to the Water Rights Panel must be
18 made not later than the 40th day after the end of the Administrative Year in which
19 such excessive pumping occurred. The Water Rights Panel shall grant such relief
20 if such over-extraction, or any portion thereof, occurred during a period of
21 Declared Water Emergency.

22 (3) Reductions in Allowed Pumping Allocations for the Next
23 Succeeding Administrative Year to Compensate for Overpumping.

24 Whenever, pursuant to Section III(B)(1), a party over-extracts in excess of
25 such party's Allowed Pumping Allocation plus that party's available One-Year
26 Carryover and any Stored Water held by that party, and such excess has not been
27 approved in advance by the Water Rights Panel, then such party's Allowed
28 Pumping Allocation for the following Administrative Year shall be reduced by an

1 amount equivalent to its total over-extractions in the particular Administrative
2 Year in which it occurred.

3 (4) Reports of Certain Over-extractions to the Court.

4 Whenever a party over-extracts in excess of 20% of such party's Allowed
5 Pumping Allocation for the particular Administrative Year plus that party's
6 available One-Year Carryover and any Stored Water held by that party, without
7 having obtained prior approval of the Water Rights Panel, such shall constitute a
8 violation of the Judgment and the Water Rights Panel shall make a written report
9 to the Court for such action as the Court may deem necessary. Such party shall be
10 subject to such injunctive and other processes and action as the Court might
11 otherwise take with regard to any other violation of such Judgment.

12 (5) Effect of Over-extractions on Rights.

13 Any party who over-extracts from Central Basin in any Administrative
14 Year shall not acquire any additional rights by reason of such over-extractions;
15 nor shall any required reductions in extractions during any subsequent years
16 reduce the Total Water Right or water rights of any party to the extent said over-
17 extractions are in compliance with paragraph 1 above.

18 (6) Pumping Under Agreement With Plaintiff During Periods of
19 Emergency.

20 Plaintiff WRD overlies Central Basin and engages in activities of
21 replenishing the groundwaters thereof. Plaintiff by resolution has appropriated
22 for use during emergencies the quantity of 17,000 acre feet of imported and
23 reclaimed water replenished by it into Central Basin, and pursuant to such
24 resolution Plaintiff reserves the right to use or cause the use of such quantity
25 during such emergency periods for the benefit of Water Purveyors.

26 (a) Notwithstanding any other provision of this Judgment,
27 parties who are Water Purveyors (including successors in interest) are
28 authorized to enter into agreements with Plaintiff for extraction of a

1 portion of Plaintiff's 17,000 acre-feet of appropriated water, in excess
2 of their respective Allowed Pumping Allocations for the particular
3 Administrative Year when the following conditions are met:

4 (i) Plaintiff is in receipt of a resolution of the
5 Board of Directors of the Metropolitan Water District of
6 Southern California ("MWD") that there is an actual or
7 immediately threatened temporary shortage of MWD's
8 imported water supply compared to MWD's needs, or a
9 temporary inability to deliver MWD's imported water
10 supply throughout its area, which will be alleviated by
11 overpumping from Central Basin.

12 (ii) The Board of Directors of both Plaintiff and
13 Central Basin Municipal Water District by resolutions
14 concur in the resolution of MWD's Board of Directors, and
15 the Board of Directors of Plaintiff finds in its resolution
16 that the average minimum elevation of water surface
17 among those wells in the Montebello Forebay of the
18 Central Basin designated as Los Angeles County Flood
19 Control District Wells Nos. 1601T, 1564P, 1615P, and
20 1626L, is at least 43.7 feet above sea level. This
21 computation shall be based upon the most recent "static
22 readings" taken, which shall have been taken not more than
23 four weeks prior. Should any of the wells designated above
24 become destroyed or otherwise be in a condition so that
25 readings cannot be made, or should the owner prevent their
26 use for such readings, the Board of Directors of the
27 Plaintiff may, upon appropriate engineering
28 recommendation, substitute such other well or wells as it

1 may deem appropriate.

2 (iii) In said resolution, Plaintiff's Board of
3 Directors sets a public hearing, and notice of the time, place
4 and date thereof (which may be continued from time to
5 time without further notice) is given by First Class Mail to
6 the current designees of the Parties, filed and served in
7 accordance with Section VI(C) of this Judgment. Said
8 notice shall be mailed at least five (5) days before the
9 scheduled hearing date.

10 (iv) At said public hearing, parties (including
11 successors in interest) are given full opportunity to be
12 heard, and at the conclusion thereof the Board of Directors
13 of Plaintiff by resolution decides to proceed with
14 agreements under this Section III(B)(6).

15 (b) All such agreements shall be subject to the following
16 requirements, and such others as Plaintiff's Board of Directors shall
17 require:

18 (i) They shall be of uniform content except as
19 to quantity involved, and any special provisions considered
20 necessary or desirable with respect to local hydrological
21 conditions or good hydrologic practice.

22 (ii) They shall be offered to all Water
23 Purveyors, excepting those which Plaintiff's Board of
24 Directors determines should not overpump because such
25 overpumping would occur in undesirable proximity to a sea
26 water barrier project designed to forestall sea water
27 intrusion, or within or in undesirable proximity to an area
28 within Central Basin wherein groundwater levels are at an

1 elevation where overpumping is under all the
2 circumstances then undesirable.

3 (iii) The maximum terms for the agreements
4 shall be four (4) months, which agreements shall
5 commence on the same date and end on the same date (and
6 which may be executed at any time within the four-month
7 period), unless an extension thereof is authorized by the
8 Court, under Part V of this Judgment.

9 (iv) They shall contain provisions requiring that
10 the Water Purveyor executing the agreement pay to the
11 Plaintiff a price in addition to the applicable replenishment
12 assessment determined on the following formula. The
13 normal price per acre-foot of Central Basin Municipal
14 Water District's (CBMWD) treated domestic and municipal
15 water, as "normal" price of such category of water is
16 defined in Section III(C)(10) (price to be paid for Exchange
17 Pool Water) as of the beginning of the contract term less
18 the deductions set forth in said paragraph 10 for the
19 Administrative Year in which the contract term
20 commences. The agreement shall provide for adjustments
21 in the first of said components for any proportional period
22 of the contract term during which the CBMWD said normal
23 price is changed, and if the agreement straddles two
24 administrative years, the said deductions shall be adjusted
25 for any proportionate period of the contract term in which
26 the amount thereof or of either subcomponent changes for
27 purposes of said paragraph 10. Any price for a partial acre-
28 foot shall be computed pro rata. Payments shall be due and

1 payable on the principle that over extractions under the
2 agreement are of the last water pumped in the
3 Administrative Year, and shall be payable as the agreement
4 shall provide.

5 (v) They shall contain provisions that: (1) All
6 of such agreements (but not less than all) shall be subject to
7 termination by Plaintiff if, in the Judgment of Plaintiff's
8 Board of Directors, the conditions or threatened conditions
9 upon which they were based have abated to the extent over
10 extractions are no longer considered necessary; and (2) that
11 any individual agreement or agreements may be terminated
12 if the Plaintiff's Board of Directors finds that adverse
13 hydrologic circumstances have developed as a result of
14 over extractions by any Water Purveyor(s) which have
15 executed said agreements, or for any other reason that
16 Plaintiff's Board of Directors finds good and sufficient.

17 (c) Other matters applicable to such agreements and
18 overpumping thereunder are as follows, without need for express
19 provisions in the agreements;

20 (i) The quantity of overpumping permitted shall
21 be additional to that which the Water Purveyor could
22 otherwise overpump under this Judgment.

23 (ii) The total quantity of permitted overpumping
24 under all said agreements during said four months shall not
25 exceed seventeen thousand (17,000) acre feet, but the
26 individual Water Purveyor shall not be responsible or
27 affected by any violation of this requirement. That total is
28 additional to over extractions otherwise permitted under

1 this Judgment.

2 (iii) Only one four month period may be utilized
3 by Plaintiff in entering into such agreements, as to any one
4 emergency or continuation thereof declared by MWD's
5 Board of Directors under Section III(B)(6)(a).

6 (iv) If any party claims it is being damaged or
7 threatened with damage by the over extractions by any
8 party to such an agreement, the first party or the Water
9 Rights Panel may seek appropriate action of the Court for
10 termination of any such agreement upon notice of hearing
11 to the party complaining, to the party to said agreement, to
12 the plaintiff, and to any parties who have filed a request for
13 special notice. Any termination shall not affect the
14 obligation of the party to make payments under the
15 agreement for over extractions which did occur thereunder.

16 (v) Plaintiff shall maintain separate accounting
17 of the proceeds from payments made pursuant to
18 agreements entered into under this Part. Said fund shall be
19 utilized solely for purposes of replenishment in
20 replacement of waters in Central Basin and West Basin.
21 Plaintiff shall as soon as practicable cause replenishment in
22 Central Basin by the amounts to be overproduced pursuant
23 to this Paragraph 6, whether through spreading, injection,
24 or in lieu agreements.

25 (vi) Over extractions pursuant to the agreements
26 shall not be subject to the "make up" provisions of the
27 Judgment as amended, provided that if any party fails to
28 make payments as required by the agreement, Plaintiff may

1 require such “make up” under Section III(B)(3) of this
2 Judgment.

3 (vii) A Water Purveyor under any such
4 agreement may, and is encouraged to enter into appropriate
5 arrangements with customers who have water rights in
6 Central Basin under or pursuant to this Judgment whereby
7 the Water Purveyor will be assisted in meeting the
8 objectives of the agreement.

9 (7) Exemption for Extractors of Contaminated Groundwater.

10 Any party herein may petition WRD for a Non-consumptive Water Use
11 Permit as part of a project to remedy or ameliorate groundwater contamination. If
12 the petition is granted as set forth in this paragraph, the petitioner may extract the
13 groundwater as permitted hereinafter, without the production counting against the
14 petitioner’s production rights.

15 (a) If the Board of WRD determines by Resolution that there is
16 a problem of groundwater contamination that a proposed program will
17 remedy or ameliorate, an operator may make extractions of
18 groundwater to remedy or ameliorate that problem without the
19 production counting against the petitioner’s production rights if the
20 water is not applied to beneficial surface use, its extractions are made
21 in compliance with all the terms and conditions of the Board
22 Resolution, and the Board has determined in the Resolution either of
23 the following:

24 (i) The groundwater to be extracted is unusable and
25 cannot be economically treated or blended for use with
26 other water.

27 (ii) The proposed program involves extraction of usable
28 water in the same quantity as will be returned to the

1 underground without degradation of quality.

2 (b) The Resolution may provide those terms and conditions the
3 Board deems appropriate, including, but not limited to, restrictions on
4 the quantity of the extractions to be so exempted, limitations on time,
5 periodic reviews, requirement of submission of test results from a
6 Board-approved laboratory, and any other relevant terms or conditions.

7 (c) Upon written notice to the operator involved, the Board
8 may rescind or modify its Resolution. The rescission or modification
9 of the Resolution shall apply to groundwater extractions occurring
10 more than ten (10) days after the rescission or modification. Notice of
11 rescission or modification shall be either mailed first class mail,
12 postage prepaid, at least two weeks prior to the meeting of the Board at
13 which the rescission or modification will be made to the address of
14 record of the operator or personally delivered two weeks prior to the
15 meeting.

16 (d) The Board's decision to grant, deny, modify or revoke a
17 permit or to interrupt or stop a permitted project may be appealed to
18 this court within thirty days of the notice thereof to the applicant and
19 upon thirty days' notice to the designees of all parties herein.

20 (e) WRD shall monitor and periodically inspect the project for
21 compliance with the terms and conditions for any permit issued
22 pursuant to these provisions.

23 (f) No party shall recover costs from any other party herein in
24 connection with determinations made with respect to this Part.

25 (8) "Call" on Carryover Converted to Stored Water.

26 Where any Party has elected, as permitted by Section III(A)(2), to convert
27 Carryover to Stored Water, any other Party which has not, within the previous ten
28 (10) years, been granted approval to extract Carryover Conversion under this

1 Section III(B)(8) more than five (5) times, may apply to the Storage Panel for the
2 right to extract all or a portion of that Carryover Conversion in the year such
3 Conversion occurs. The Storage Panel shall grant such request, providing there is
4 no Material Physical Harm, if it determines that leased groundwater to meet the
5 applicant's needs within the Basin cannot be obtained for less than forty-five
6 percent (45%) of MWD's Imported Water rate for delivery of untreated water to
7 the Central Basin spreading facilities (which rate is presently MWD's "Full
8 Service Untreated Volumetric Cost, Tier 1"), and that the applicant will fully
9 extract its Allowed Pumping Allocation, Carryover, and Stored Water, if any, in
10 addition to its permitted overextraction under Section III(B)(1), prior to accessing
11 such Carryover Conversion.

12 Upon such approval, the applicant may thereafter extract such water as
13 provided herein. A Party so extracting groundwater shall fully restore such
14 extracted water (either through under-extraction of its rights or through importing
15 water) during the five-year period following the Year in which the extraction
16 under this Section occurs. Otherwise, the extracting Party shall pay to the
17 Watermaster an amount equal to 100% of MWD's Imported Water rate for
18 purchase and delivery of untreated water to the Central Basin spreading facilities
19 (which rate is presently MWD's "Full Service Untreated Volumetric Cost, Tier
20 1") whether or not such water is available that year, for the year during which is
21 the fifth anniversary of the year during which such Carryover Conversion
22 extraction occurs, multiplied by the amount of Carryover Conversion so extracted
23 and not restored during such five-year period. Payment shall be made within
24 thirty (30) days of demand by Watermaster. No Replenishment Assessment shall
25 be due on Carryover Conversion so extracted. However, the Party must deposit
26 with the Watermaster an amount equal to the Replenishment Assessment that
27 would otherwise be imposed by WRD upon such extraction. If the party restores
28 the water within the 5-year repayment period, then the Watermaster shall

1 promptly return the deposit to the Party, without interest. If the Party does not
2 restore the water within the 5-year repayment period, the deposit shall be credited
3 towards the Party's obligation to pay 100% of MWD's Imported Water rate as
4 required herein.

5 Should there be multiple requests to so extract Carryover Conversion in
6 the same year, the Storage Panel shall allocate such extraction right such that each
7 requesting party may extract a pro rata portion of the available Carryover
8 Conversion for that year. No party may extract in excess of 2,500 acre feet of
9 groundwater pursuant to this Section III(B)(8) in a single Year. Amounts paid to
10 Watermaster hereunder shall be used by WRD solely for purchase of water for
11 replenishment in the Basin. Watermaster, through the Storage Panel, shall give
12 reasonable notice to the Parties of any application to so extract Carryover
13 Conversion in such manner as the Storage Panel shall determine, including,
14 without limitation, notice by electronic mail or by website posting, at least ten
15 (10) days prior to consideration of any such application.

16 C. Exchange Pool Provisions.

17 (1) Definitions.

18 For purposes of these Exchange Pool provisions, the following words and
19 terms have the following meanings:

20 (a) "Exchange Pool" is the arrangement hereinafter set forth
21 whereby certain of the parties, ("Exchangees") may, notwithstanding
22 the other provisions of the Judgment, extract additional water from
23 Central Basin to meet their needs, and certain other of the parties
24 ("Exchangors"), reduce their extractions below their Allowed Pumping
25 Allocations in order to permit such additional extractions by others.

26 (b) "Exchangor" is one who offers, voluntarily or otherwise,
27 pursuant to subsequent provisions, to reduce its extractions below its
28 Allowed Pumping Allocation in order to permit such additional

1 extractions by others.

2 (c) “Exchangee” is one who requests permission to extract
3 additional water from Central Basin.

4 (d) “Undue hardship” means unusual and severe economic or
5 operational hardship, other than that arising (i) by reason of any
6 differential in quality that might exist between water extracted from
7 Central Basin and water available for importation or (ii) by reason of
8 any difference in cost to a party in subscribing to the Exchange Pool
9 and reducing its extractions of water from Central Basin in an
10 equivalent amount as opposed to extracting any such quantity itself.

11 (2) Parties Who May Purchase Water Through the Exchange Pool.

12 Any party not having existing facilities for the taking of imported water as
13 of the beginning of any Administrative Year, and any party having such facilities
14 as of the beginning of any Administrative Year who is unable, without undue
15 hardship, to obtain, take, and put to beneficial use, through its distribution system
16 or systems existing as of the beginning of the particular Administrative Year,
17 imported water in a quantity which, when added to its Allowed Pumping
18 Allocation for that particular Administrative Year, will meet its estimated needs
19 for that particular Administrative Year, may purchase water from the Exchange
20 Pool, subject to the limitations contained in this Section III(C) (Subpart “C”
21 hereinafter).

22 (3) Procedure for Purchasing Exchange Pool Water.

23 Not later than the 40th day following the commencement of each
24 Administrative Year, each such party desiring to purchase water from the
25 Exchange Pool shall file with the Watermaster a request to so purchase, setting
26 forth the amount of water in acre feet that such party estimates that it will require
27 during the then current Administrative Year in excess of the total of:

28 (a) Its Allowed Pumping Allocation for that particular

Administrative Year; and

(b) The imported water, if any, which it estimates it will be able, without undue hardship, to obtain, take and put to beneficial use, through its distribution system or systems existing as of the beginning of that particular Administrative Year.

Any party who as of the beginning of any Administrative Year has existing facilities for the taking of imported water and who makes a request to purchase from the Exchange Pool must provide with such request substantiating data and other proof which, together with any further data and other proof requested by the Water Rights Panel, establishes that such party is unable without undue hardship, to obtain, take and put to beneficial use through its said distribution system or systems a sufficient quantity of imported water which, when added to its said Allowed Pumping Allocation for the particular Administrative Year, will meet its estimated needs. As to any such party, the Water Rights Panel shall make a determination whether the party has so established such inability, which determination shall be subject to review by the court under the procedure set forth in Part II of this Judgment. Any party making a request to purchase from the Exchange Pool shall either furnish such substantiating data and other proof, or a statement that such party had no existing facilities for the taking of imported water as of the beginning of that Administrative Year, and in either event a statement of the basis for the quantity requested to be purchased.

(4) Subscriptions to Exchange Pool.

(a) Required Subscription. Each party having existing facilities for the taking of imported water as of the beginning of any Administrative Year hereby subscribed to the Exchange Pool for purposes of meeting Category (a) requests thereon, as more particularly defined in paragraph 5 of this Subpart C, twenty percent

1 (20%) of its Allowed Pumping Allocation, or the quantity of imported
2 water which it is able, without undue hardship, to obtain, take and put
3 to beneficial use through its distribution system or systems existing as
4 of the beginning of the particular Administrative Year in addition to
5 such party's own estimated needs for imported water during that
6 Administrative Year, whichever is the lesser. A party's subscription
7 under this subparagraph (a) and subparagraph (b) of this paragraph 4 is
8 sometimes hereinafter referred to as a "required subscription."

9 (b) Report to Watermaster Water Rights Panel by Parties with
10 Connections and Unable to Subscribe 20%. Any party having existing
11 facilities for the taking of imported water and estimating that it will be
12 unable, without undue hardship, in that Administrative Year to obtain,
13 take and put to beneficial use through its distribution system or
14 systems existing as of the beginning of that Administrative Year,
15 sufficient imported water to further reduce its extractions from the
16 Central Basin by twenty percent (20%) of its Allowed Pumping
17 Allocation for purposes of providing water to the Exchange Pool must
18 furnish not later than the 40th day following the commencement of
19 such Administrative Year substantiating data and other proof which,
20 together with any further data and other proof requested by the Water
21 Rights Panel, establishes said inability or such party shall be deemed
22 to have subscribed twenty percent (20%) of its Allowed Pumping
23 Allocation for the purpose of providing water to the Exchange Pool.
24 As to any such party so contending such inability, the Water Rights
25 Panel shall make a determination whether the party has so established
26 such inability, which determination shall be subject to review by the
27 Court under the procedure set forth in Part II of this Judgment.

28 (c) Voluntary Subscriptions. Any party, whether or not having

1 facilities for the taking of imported water, who desires to subscribe to
2 the Exchange Pool a quantity or further quantity of its Allowed
3 Pumping Allocation, may so notify the Water Rights Panel in writing
4 of the quantity of such offer on or prior to the 40th day following the
5 commencement of the particular Administrative Year. Such
6 subscriptions are referred to hereinafter as “voluntary subscriptions.”
7 Any Exchangor who desires that any part of its otherwise required
8 subscription not needed to fill Category (a) requests shall be available
9 for Category (b) requests may so notify the Water Rights Panel in
10 writing on or prior to said 40th day. If all of that Exchangor’s
11 otherwise required subscription is not needed in order to fill Category
12 (a) requests, the remainder of such required subscription not so used,
13 or such part thereof as such Exchangor may designate, shall be deemed
14 to be a voluntary subscription.

15 (5) Limitations on Purchases of Exchange Pool Water and Allocation
16 of Requests to Purchase Exchange Pool Water Among Exchangors.

17 (a) Categories of Requests. Two categories of Exchange Pool
18 requests are established as follows:

19 (i) Category (a) requests. The quantity requested by
20 each Exchangee, whether or not that Exchangee has an
21 Allowed Pumping Allocation, which quantity is not in
22 excess of 150% of its Allowed Pumping Allocation, if any,
23 or 100 acre feet, whichever is greater. Requests or portions
24 thereof within the above criteria are sometimes hereinafter
25 referred to as “Category (a) requests.”

26 (ii) Category (b) requests. The quantity requested by
27 each Exchangee having an Allowed Pumping Allocation to
28 the extent the request is in excess of 150% of that Allowed

1 Pumping Allocation or 100 acre feet, whichever is greater,
2 and the quantity requested by each Exchangee having no
3 Allowed Pumping Allocation to the extent the request is in
4 excess of 100 acre feet. Portions of requests within the
5 above criteria are sometimes hereinafter referred to as
6 “Category (b) requests.”

7 (b) Filling of Category (a) Requests. All Exchange Pool
8 subscriptions, required and voluntary, shall be available to fill
9 Category (a) requests. Category (a) requests shall be filled first from
10 voluntary subscriptions, and if voluntary subscriptions should be
11 insufficient to fill all Category (a) requests required subscriptions shall
12 be then utilized to fill Category (a) requests. All Category (a) requests
13 shall be first filled before any Category (b) requests are filled.

14 (c) Filling of Category (b) Requests. To the extent that
15 voluntary subscriptions have not been utilized in filling Category (a)
16 requests, Category (b) requests shall be filled only out of any
17 remaining voluntary subscriptions. Required subscriptions will then
18 be utilized for the filling of any remaining Category (b) requests.

19 (d) Allocation of Requests to Subscriptions When Available
20 Subscriptions Exceed Requests. In the event the quantity of
21 subscriptions available for any category of requests exceeds those
22 requests in that category, or exceeds the remainder of those requests in
23 that category, such requests shall be filled out of such subscriptions
24 proportionately in relation to the quantity of each subscription.

25 (e) Allocation of Subscriptions to Category (b) Requests in the
26 Event of Shortage of Subscriptions. In the event available
27 subscriptions are insufficient to meet Category (b) requests, available
28 subscriptions shall be allocated to each request in the proportion that

1 the particular request bears to the total requests of the particular
2 category.

3 (6) Additional Voluntary Subscriptions.

4 If subscriptions available to meet the requests of Exchangees are
5 insufficient to meet all requests, additional voluntary subscriptions may be
6 solicited and received from parties by the Water Rights Panel. Such additional
7 subscriptions shall be allocated first to Category (a) requests to the extent unfilled,
8 and next to Category (b) requests to the extent unfilled. All allocations are to be
9 otherwise in the same manner as earlier provided in paragraph 5 (a) through 5 (e)
10 inclusive.

11 (7) Effect if Category (a) Requests Exceed Available Subscriptions,
12 Both Required and Voluntary.

13 In the event that the quantity of subscriptions available to fill Category (a)
14 requests is less than the total quantity of such requests, the Exchangees may,
15 nonetheless, extract the full amount of their Category (a) requests otherwise
16 approved by the Water Rights Panel as if sufficient subscriptions were available.
17 The amounts received by the Water Rights Panel on account of that portion of the
18 approved requests in excess of the total quantities available from Exchangors
19 shall be paid by the Water Rights Panel to WRD in trust for the purpose of
20 purchasing imported water and spreading the same in Central Basin for
21 replenishment thereof. Thereafter WRD may, at any time, withdraw said funds or
22 any part thereof so credited in trust for the aforesaid purpose, or may by the 40th
23 day of any Administrative Year utilize all or any portion of said funds for the
24 purchase of water available from subscriptions by Exchangors in the event the
25 total quantity of such subscriptions exceeds the total quantity of approved
26 requests by parties to purchase Exchange Pool water. To the extent that there is
27 such an excess of available subscriptions over requests and to the extent that the
28 existing credit in favor of WRD is sufficient to purchase such excess quantity at

1 the price established for Exchange Pool purchases during that Administrative
2 Year, the money shall be paid to the Exchangors in the same manner as if another
3 party had made such purchase as an Exchangee. WRD shall not extract any such
4 Exchange Pool water so purchased.

5 (8) Additional Pumping by Exchangees Pursuant to Exchange Pool
6 Provisions.

7 An Exchangee may extract from Central Basin in addition to its Allowed
8 Pumping Allocation for a particular Administrative Year that quantity of water
9 which it has requested to purchase from the Exchange Pool during that
10 Administrative Year and which has been allocated to it pursuant to the provisions
11 of paragraphs 5, 6 and 7. The first pumping by an Exchangee in any
12 Administrative Year shall be deemed to be pumping of the party's allocation of
13 Exchange Pool water.

14 (9) Reduction in Pumping by Exchangors.

15 Each Exchangor shall in each Administrative Year reduce its extractions
16 of water from Central Basin below its Allowed Pumping Allocation for the
17 particular year in a quantity equal to the quantity of Exchange Pool requests
18 allocated to it pursuant to the provisions of paragraphs 4, 5, 6 and 7 of this
19 Subpart C.

20 (10) Price to be Paid for Exchange Pool Water.

21 The price to be paid by Exchangees and to be paid to Exchangors per acre
22 foot for required and voluntary subscriptions of Exchangors utilized to fill
23 requests on the Exchange Pool by Exchangees shall be the dollar amount
24 computed as follows by the Water Rights Panel for each Administrative Year.
25 The "normal" price as of the beginning of the Administrative Year charged by
26 Central Basin Municipal Water District (CBMWD) for treated MWD
27 (Metropolitan Water District of Southern California) water used for domestic and
28 municipal purposes shall be determined, and if on that date there are any changes

1 scheduled during that Administrative Year in CBMWD's "normal" price for such
2 category of water, the weighted daily "normal" CBMWD price shall be
3 determined and used in lieu of the beginning such price; and there shall be
4 deducted from such beginning or weighted price, as the case may be, the
5 "incremental cost of pumping water in Central Basin" at the beginning of the
6 Administrative Year and any then current rate or rates, of assessments levied on
7 the pumping of groundwater in Central Basin by Plaintiff District and any other
8 governmental agency. The "normal" price charged by CBMWD shall be the
9 highest price of CBMWD for normal service excluding any surcharge or higher
10 rate for emergency deliveries or otherwise failing to comply with CBMWD rates
11 and regulations relating to earlier deliveries. The "incremental cost of pumping
12 water in Central Basin" as of the beginning of the Administrative Year shall be
13 deemed to be the Southern California Edison Company Schedule No. PA-1 rate
14 per kilowatt-hour, including all adjustments and all uniform authorized additions
15 to the basic rate, multiplied by 560 kilowatt-hours per acre-foot, rounded to the
16 nearest dollar (which number of kilowatt-hours has been determined to represent
17 the average energy consumption to pump an acre-foot of water in Central Basin).
18 In applying said PA-1 rate the charge per kilowatt-hour under the schedule shall
19 be employed and if there are any rate blocks then the last rate block shall be
20 employed. Should a change occur in Edison schedule designations, the Water
21 Rights Panel shall employ that applicable to motors used for pumping water by
22 municipal utilities.

23 (11) Carry-over of Exchange Pool Purchases by Exchangees.

24 An Exchangee who does not extract from Central Basin in a particular
25 Administrative Year a quantity of water equal to the total of (a) its Allowed
26 Pumping Allocation for that particular Administrative Year, reduced by any
27 authorized amount of carryover into the next succeeding Administrative Year
28 pursuant to the provisions of Section III(A) of this Judgment, and (b) the quantity

1 that it purchased from the Exchange Pool for that particular Administrative Year,
2 may carry over into the next succeeding Administrative Year the right to extract
3 from Central Basin a quantity equal to the difference between said total and the
4 quantity actually extracted in that Administrative Year, but not exceeding the
5 quantity purchased from the Exchange Pool for that Administrative Year. Any
6 such carryover shall be in addition to that provided in said Section III(A).

7 If the "Basinwide Average Exchange Pool Price" in the next succeeding
8 Administrative Year exceeds the "Exchange Pool Price" in the previous
9 Administrative Year any such Exchangee exercising such carryover rights
10 hereinabove provided shall pay to the Watermaster, forthwith upon the
11 determination of the "Exchange Pool Price" in said succeeding Administrative
12 Year, and as a condition to such carryover rights, an additional amount
13 determined by multiplying the number of acre feet of carryover by the difference
14 in "Exchange Pool Price" as between the two Administrative Years. Such
15 additional payment shall be miscellaneous income to the Watermaster which shall
16 be applied by it against that share of the Watermaster's Administrative Body's
17 budget to be paid by the parties to this Agreement for the second Administrative
18 Year succeeding that in which the Exchange Pool water was so purchased. For
19 purposes of this paragraph, the term Basinwide Average Exchange Pool Price
20 means the average price per acre foot paid for Exchange Pool water produced
21 within the Central Basin during the year for which such determination is to be
22 made, taking into account all Exchange Pool transactions consummated during
23 that year.

24 (12) Notification by Watermaster to Exchangors and Exchangees of
25 Exchange Pool Requests and Allocations Thereof and Price of Exchange Pool
26 Water.

27 Not later than the 65th day after the commencement of each
28 Administrative Year, the Administrative Body of Watermaster shall determine

1 and notify all Exchangors and Exchangees of the total of the allocated requests for
2 Exchange Pool water and shall provide a schedule divided into categories of
3 requests showing the quantity allocated to each Exchangee and a schedule of the
4 allocation of the total Exchange Pool requirements among the Exchangors. Such
5 notification shall also advise Exchangors and Exchangees of the prices to be paid
6 to Exchangors for subscriptions utilized and the Exchange Pool Price for that
7 Administrative Year as determined by the Water Rights Panel. The
8 determinations of the Watermaster in this regard shall be subject to review by the
9 Court in accordance with the procedure set forth in Part II of this Judgment.

10 (13) Payment by Exchangees.

11 Each Exchangee shall, on or prior to last day of the third month of each
12 Administrative Year, pay to the Watermaster one-quarter of said price per acre-
13 foot multiplied by the number of acre feet of such party's approved request and
14 shall, on or before the last day of each of the next succeeding three months, pay a
15 like sum to the Watermaster. Such amounts must be paid by each Exchangee
16 regardless of whether or not it in fact extracts or uses any of the water it has
17 requested to purchase from the Exchange Pool.

18 (14) Payments to Exchangors.

19 As soon as possible after receipt of moneys from Exchangees, the
20 Watermaster shall remit to the Exchangors their pro rata portions of the amount so
21 received in accordance with the provisions of paragraph 10 above.

22 (15) Delinquent Payments.

23 Any amounts not paid on or prior to any due date above shall carry interest
24 at the rate of 1% per month or any part of a month. Any amounts required to be
25 so paid may be enforced by the equitable powers of the Court, including, but not
26 limited to, the injunctive process of the Court. In addition thereto, the
27 Watermaster, as Trustee for the Exchangors and acting through the Water Rights
28 Panel, may enforce such payment by any appropriate legal action, and shall be

1 entitled to recover as additional damages reasonable attorneys' fees incurred in
2 connection therewith. If any Exchangee shall fail to make any payments required
3 of it on or before 30 days after the last payment is due, including any accrued
4 interest, said party shall thenceforward not be entitled to purchase water from the
5 Exchange Pool in any succeeding Administrative Year except upon order of the
6 Court, upon such conditions as the Court may impose.

7
8 IV. PROVISIONS FOR THE STORAGE OF WATER AND THE EXTRACTION
9 OF STORED WATER.

10 A. Adjudication of Available Dewatered Space, Storage Capacity and
11 Storage Apportionment.

12 There exists within the Basin a substantial amount of available space which has
13 not been optimally utilized for basin management and for storage of native and imported
14 waters. The Court finds and determines that (i) there is 330,000 acre feet of Available
15 Dewatered Space in the Basin; (ii) use of this Available Dewatered Space will increase
16 reasonable and beneficial use of the Basin by permitting the more efficient procurement
17 and management of Replenishment Water, conjunctive use, and for direct and in-lieu
18 recharge, thereby increasing the prudent storage and recovery of Stored Water for later
19 use by parties to this Judgment, conservation of water and reliability of the water supply
20 available to all Parties; and (iii) use of the Available Dewatered Space pursuant to the
21 terms and conditions of this Judgment will not result in Material Physical Harm.

22 B. Avoidance of Material Physical Harm.

23 It is essential that the use of the Available Dewatered Space be undertaken for the
24 greatest public benefit pursuant to uniform, certain, and transparent regulation that
25 encourages the conservation of water and reliability of the water supply, avoids Material
26 Physical Harm, and promotes the reasonable and beneficial use of water. Accordingly,
27 in the event Watermaster becomes aware of the development of a Material Physical
28 Harm, or imminent threat of the development of a Material Physical Harm, relating to the

1 use of the Available Dewatered Space, Watermaster shall, within thirty (30) days
2 thereafter, notice a hearing before the Court and concurrently file a report with the Court,
3 served on all parties, which shall explain the relevant facts then known to Watermaster
4 relating to the Material Physical Harm, or imminent threat thereof, including without
5 limitation, the location of the occurrence, the source or cause, existing and potential
6 physical impacts or consequences of the identified or threatened material Physical Harm,
7 and any recommendations to remediate the identified or threatened Material Physical
8 Harm.

9 C. Apportionment of Available Dewatered Space.

10 To fairly balance the needs of the divergent interests of parties having water rights
11 in the Basin, on the one hand, and the replenishment functions of WRD on the other
12 hand, and in consideration of the shared desire and public purpose of removing
13 impediments to the voluntary conservation, storage, exchange and transfer of water, all
14 of the Available Dewatered Space is hereby adjudicated and apportioned into
15 complimentary classifications of Stored Water and a Basin Operating Reserve as set
16 forth in this Part IV. The apportionment contemplates flexible administration of storage
17 capacity where use is apportioned among competing needs, while allowing all Available
18 Dewatered Space to be used from time to time on a “space available” basis, subject to the
19 priorities specified in this Judgment, and as further defined in Section IV(I) of this
20 Judgment. The Court further finds and determines that, of the Available Dewatered
21 Space, there is 220,000 acre-feet of storage capacity in the Central Basin which is
22 presently available (“Adjudicated Storage Capacity”). The use of Adjudicated Storage
23 Capacity as provided in this Judgment will not adversely affect the efficient operation of
24 the Basin or the recharge of water necessary for the production of the parties’ respective
25 Allowed Pumping Allocations. The apportionment of Adjudicated Storage Capacity as
26 provided herein will allow for flexible administration of groundwater storage within the
27 Basin. The Adjudicated Storage Capacity is hereby assigned to Individual Storage
28 Allocations and Community Storage as provided herein, provided however that if all

1 space in a particular classification is fully occupied then, on a “space available” basis, to
2 available space within the other classifications of Adjudicated Storage Capacity and,
3 only then, to available space within Basin Operating Reserve.

4 The Court further finds and determines that, out of the Available Dewatered
5 Space, there is 110,000 acre feet that should be set aside for use by WRD as a Basin
6 Operating Reserve, provided in Section IV(L), and subject to temporary occupancy by
7 Stored Water as permitted hereunder.

8 No storage of water shall occur in the Basin except in conformity with this
9 Judgment.

10 D. Individual Storage Allocation.

11 Each Party having an adjudicated groundwater extraction right hereunder shall
12 have a priority right to store water in an Individual Storage Account, through conversion
13 of Carryover to Stored Water as provided herein, or by any means authorized by this
14 Judgment, up to a maximum of 50% of such party’s Allowed Pumping Allocation. The
15 cumulative quantity of Adjudicated Storage Capacity subject to individual storage
16 allocation is 108,750 acre-feet. In recognition of prior importation of water which was
17 introduced into the Basin as Stored Water, and which has not yet been extracted, the
18 Court finds and determines that, as of the date of this Order, the following Parties have
19 occupied a portion of their respective Individual Storage Allocations and have all
20 associated rights therein, as follows:

21	City of Long Beach:	13,076.8 acre-feet
22	City of Lakewood:	500 acre-feet
23	City of Downey:	500 acre-feet
24	City of Cerritos	500 acre-feet

25 E. Community Storage; Regional Disadvantaged Communities Incentive
26 Program.

27 In addition to Individual Storage Allocation, a Party that has fully occupied its
28 Individual Storage allocation may, on a first in time, first in right basis (subject to the

limits expressed below) place water into storage in the “Community Storage Pool.” The cumulative quantity of Adjudicated Storage Capacity allocated to Community Storage shall be 111,250 acre-feet. So long as there is available capacity in the Community Storage Pool, any Party may store water in the Community Storage Pool through conversion of Carryover to Stored Water as provided herein, or by any other means authorized by this Judgment, provided such Party has first fully occupied that party’s available Individual Storage Allocation.

(1) Parties to this Judgment which, as of January 1, 2013, held Allowed Pumping Allocation of not greater than 5,000 acre-feet shall have a first priority right to occupy, in the aggregate, up to 10,000 acre-feet of storage space within the Central Basin Community Storage Pool, on the basis of first in time, first in right.

(2) Water stored pursuant to the Regional Disadvantaged Communities Incentive Program shall have a second priority right to occupy up to 23,000 acre-feet within the Community Storage Pool, on such terms as shall be determined by the Court.

(3) Any further storage in excess of the maximum quantity of Community Storage will be on a “space-available” interim basis. From time to time, and on a “space-available” basis, the total quantity of water available for storage is permitted to exceed Adjudicated Storage Capacity for the Community Storage Pool on an interim basis. This interim storage may occur if storage capacity exists as a result of unused Adjudicated Storage Capacity within other classifications, or available space exists in the Basin Operating Reserve. Such interim storage, however, is subject to priority rights to such Dewatered Space as provided in this Judgment. A party that seeks to convert the water temporarily held in interim storage to a more firm right, may contract for the use of another party’s Individual Storage Allocation, or may add such water to the Community Storage Pool once space therein becomes available.

1 (4) After a party occupies available storage capacity within the
2 Community Storage Pool and then withdraws water from the Community Storage
3 Pool, the storing party will be allowed a period of twenty-four (24) months to
4 refill the evacuated storage before the capacity will be determined excess and
5 available for use by other parties. Once the Basin's Community Storage Pool has
6 been filled for the first time, a party may exercise its twenty-four (24) month refill
7 priority only once, and then only provided there is then capacity available to
8 permit that party to refill the vacated space. Except to the extent Community
9 Storage space may be subject to such priority right to re-fill, all space therein shall
10 be occupied on a first in time, first in right basis.

11 (5) A party that has occupied storage in the Community Storage Pool
12 for ten (10) consecutive years shall be deemed to extract its Stored Water first in
13 subsequent years (notwithstanding the order of water production set forth in
14 Section I(B)(3)) until its entire Community Storage account has been extracted,
15 but thereafter may again make use of Community Storage on the same terms
16 available to other parties on a first in time, first in right, space-available basis.

17 (6) Any quantity of water held in the Community Storage Pool for a
18 term greater than ten (10) consecutive years shall be assessed an annual water loss
19 equal to 5% of the lowest quantity of water held within the party's Community
20 Storage Pool account at any time during the immediately preceding ten-year
21 period. The lowest quantity means the smallest amount of water held by the Party
22 in the Community Storage Pool during any of the preceding ten (10) years, with a
23 new loss calculation being undertaken every year. Water subject to the loss
24 assessment will be deemed dedicated to the Basin Operating Reserve in
25 furtherance of the physical solution without compensation. Water lost to the
26 Basin shall constitute water replenished into the Central Basin for the benefit of
27 all parties

28 F. Limit on Storage.

1 Irrespective of the category of storage utilized, each party to this Judgment may
2 not cumulatively have in storage at any time Stored Water totaling more than two
3 hundred percent (200%) of that party's Allowed Pumping Allocation. Subject to the
4 foregoing, the right to produce Stored Water may be freely transferred to another party to
5 this Judgment, or as otherwise permitted herein.

6 G. Extractions of Stored Water; Exemption from Replenishment Assessment.

7 The Court finds and declares that the extraction of Stored Water as permitted
8 hereunder does not constitute "production of groundwater" within the meaning of Water
9 Code Section 60317 and that no Replenishment Assessment shall be levied on the
10 extraction of Stored Water. WRD has stipulated to the same. This determination reflects
11 the practical application of certain provisions of this Judgment concerning storage of
12 water, including, without limitation, understanding the following: (1) payment of the
13 Replenishment Assessment is required upon the conversion of Carryover Water into
14 storage, and; (2) developed water introduced into the Basin for storage by or on behalf of
15 a Party through spreading or injection need not be replenished by WRD and should not
16 be subject to the Replenishment Assessment.

17 H. Storage Procedure.

18 The Administrative Body shall (i) prescribe forms and procedures for the orderly
19 reporting of Stored Water, (ii) maintain records of all water stored in the Basin, and (iii)
20 undertake monitoring and modeling of Stored Water as may be reasonably required. As
21 to any Storage Projects that will require review and approval by the Storage Panel, the
22 Administrative Body shall provide appropriate applications, and shall work with project
23 applicants to complete the application documents for presentation to the Storage Panel.
24 The Administrative Body shall be responsible for conducting any groundwater modeling
25 necessary to evaluate a proposed Storage Project. The proponent of a proposed project
26 will bear all costs associated with the review of the application for approval of the project
27 and all costs associated with its implementation. Nothing in this Judgment shall alter the
28 applicant(s) duty to comply with CEQA or to meet other legal requirements as to any

1 proposed Storage Project. Within thirty (30) days after final submission of the storage
2 application documents, the Administrative Body shall provide notice of the storage
3 application (either by electronic mail or U.S. postal mail), together with a copy of the
4 application documents, to all parties possessing an Allowed Pumping Allocation, and to
5 any other person requesting notice thereof. Following notice, any necessary hearings
6 before the Storage Panel shall be conducted as provided in Section IV(O) of this
7 Judgment.

8 I. Loss of Stored Water/Relative Priority.

9 To balance the need to protect priority uses of storage and to encourage the full
10 utilization of Adjudicated Storage Capacity and Basin Operating Reserve where it can be
11 accommodated without interference with priority uses, and except as otherwise provided
12 in this Judgment, no water held in any authorized storage account will be deemed lost
13 from that storage account unless the cumulative quantity of water held as Stored Water
14 plus the quantity of water held within the Basin Operating Reserve exceeds 330,000
15 acre-feet. Where all Adjudicated Storage Capacity and Basin Operating Reserve has
16 been occupied, the first Stored Water to be deemed lost shall be the last water stored as
17 Community Storage. Upon receipt of a bona fide request by another use entitled to
18 priority hereunder, Watermaster shall issue a notice requiring the other parties to
19 evacuate their Stored Water. Any Stored Water that is not evacuated shall be deemed
20 dedicated to the Basin Operating Reserve in furtherance of the physical solution without
21 compensation and accounted for accordingly.

22 J. Limits on Extraction.

23 Anything in this Judgment to the contrary notwithstanding, no party shall extract
24 greater than 140% of the sum of (i) the party's Allowed Pumping Allocation and (ii) the
25 party's leased water, except upon prior approval by the Water Rights Panel. For this
26 purpose, a party's total extraction right for a particular year shall include that party's
27 Allowed Pumping Allocation and any contractual right through lease or other means to
28 utilize the adjudicated rights of another party. Where such proposed extraction would

1 occur within the Central Basin Pressure Area as defined by Watermaster consistent with
2 historical records, the Water Rights Panel shall submit such request for review by the
3 Board of WRD. The Water Rights Panel shall not approve any request for over-
4 extraction within the Pressure Area without a written finding by the Board of WRD that
5 such over-extraction will not cause Material Physical Harm. The role of the Board of
6 WRD in this process shall not be read to expand or restrict WRD's statutory authority.
7 Consideration shall be on an expedited basis.

8 K. Increased Extractions in the Central Basin for Certain Water Purveyors.

9 (1) This Court also maintains continuing jurisdiction over the West
10 Coast Basin, which bounds the Central Basin to the west.

11 (2) Certain Water Purveyors are parties to both this Amended
12 Judgment and the judgment governing the West Coast Basin and serve
13 communities overlying both the Central Basin and the West Coast Basin.

14 (3) Certain Water Purveyors may exceed their Allowed Pumping
15 Allocation in any Administrative Year, subject to all of the following conditions:

16 (a) The Water Purveyor is one of the following eligible Parties:

17 (i) City of Los Angeles

18 (ii) Golden State Water Company

19 (iii) California Water Service Company.

20 (b) Increased extractions pursuant to this Section shall not
21 exceed 5,000 acre-feet per Water Purveyor for the particular
22 Administrative Year.

23 (c) Increased extractions pursuant to this Section shall not
24 exceed the Water Purveyor's unused "Adjudicated Rights" in the West
25 Coast Basin.

26 (d) Increased extractions pursuant to this Section shall not
27 result in Material Physical Harm.

28 (4) Notwithstanding the foregoing, nothing herein permits extraction

1 of water within the Central Basin in excess of 140% of Allowed Pumping
2 Allocation for the particular Administrative Year, except as otherwise permitted
3 under this Judgment.

4 (5) Replenishment of any water extracted from the Central Basin
5 pursuant to this Section shall occur exclusively in the Central Basin.

6 (6) The benefits of this Section are made available only to the certain
7 Water Purveyors that serve communities overlying the Central Basin and
8 communities overlying the West Basin, in recognition of the management of
9 water resources by those Water Purveyors to serve such overlying communities.
10 It is not made, nor is it related to, a determination of an underflow between the
11 basins, a cost or benefit allocation, or any other factor relating to the allocation of
12 the Replenishment Assessment.

13 L. Special Provisions for Temporary Storage within Community Storage
14 Pool.

15 The Central Basin Municipal Water District (“CBMWD”) shall take such action
16 as may be necessary to reduce its Allowed Pumping Allocation to five (5) acre-feet or
17 fewer by December 31, 2018, and has agreed, by stipulation, not to acquire any
18 additional Central Basin water rights. Upon application by CBMWD, the Storage Panel
19 may, after making each of the findings required in this subsection, approve storage of
20 water by CBMWD within the Community Storage Pool subject to the stated conditions.
21 The Storage Panel may only authorize such storage after finding each of the following to
22 be true as of the date of such approval:

23 (1) CBMWD (a) then owns five (5) acre-feet or fewer of Allowed
24 Pumping Allocation, and (b) has not produced water utilizing any extraction
25 rights it holds within the Basin but has only engaged in the sale or leasing of those
26 rights to others.

27
28 (2) There is available space for Storage within the Community Storage

1 Pool.

2
3 (3) CBMWD has identified a source of imported water that may be
4 brought into the Basin and stored underground.

5 (4) The water identified for storage (a) is unlikely to be acquired by
6 other parties through surface delivery for use within the Basin, and (b) was
7 offered to WRD to purchase for replenishment purposes at the same price that
8 CBMWD otherwise sells imported water to WRD and WRD declined to purchase
9 said water, within a reasonable period of time.

10
11 (5) There will be no Material Physical Harm associated with the
12 introduction of the water into storage, or its extraction, in the manner approved by
13 the Storage Panel.

14 The condition expressed in Section IV(L)(1)(a) above shall not be operative until
15 January 1, 2019, or upon reduction of CBMWD's Allowed Pumping Allocation
16 to five (5) acre-feet or fewer, whichever first occurs. CBMWD may not extract
17 the Stored Water, and may instead only transfer that Stored Water to a party
18 having extraction rights, or to WRD for replenishment purposes only. Such
19 Stored Water not so transferred within three (3) years following its storage may
20 be purchased by WRD, at its option, for replenishment purposes only, at a price
21 not exceeding the actual cost incurred by CBMWD in importing and storing the
22 water in the first instance, plus a reasonable administrative charge for overhead
23 not exceeding five percent (5%) of the price paid by CBMWD for the water with
24 no other fees or markups imposed by CBMWD. Except as otherwise permitted in
25 this Section, any such Stored Water held by CBMWD for a term greater than
26 three (3) years shall be assessed an annual water loss equal to 10% of the amount
27 of such Stored Water at the end of each year. Water subject to the loss
28

1 assessment will be deemed dedicated to the Basin Operating Reserve in
2 furtherance of the physical solution without further compensation. The Storage
3 Panel shall grant CBMWD one or more extensions of such term, not exceeding
4 total extensions of three (3) additional years, following public hearing, if the
5 Storage Panel determines that the Stored Water has been actively marketed by
6 CBMWD for transfer to Parties on reasonable terms in the previous year. The
7 Storage Panel may impose such additional reasonable conditions as it determines
8 to be appropriate. Any review by the Storage Panel hereunder shall only occur at
9 a public hearing held following at least 15 days' (but not more than 30 days')
10 mailed notice to all Parties to this Judgment, at which hearing an opportunity for
11 public comment shall be afforded in advance of any such decision. However, the
12 Storage Panel may consider an application on shorter notice under exigent
13 circumstances, including the potential loss of the water proposed to be stored if
14 action is not taken sooner. CBMWD shall have the right to appeal any action or
15 inaction by the Storage Panel to this court. The storage and extraction of Stored
16 Water hereunder shall otherwise be subject to all other provisions of this
17 Judgment. The court finds and declares that this subsection constitutes a "court
18 order issued by a court having jurisdiction over the adjudication of groundwater
19 extraction rights within the groundwater basin where storage is sought" within the
20 meaning of Water Code §71610(b)(2)(B). Nothing in this provision impedes
21 CBMWD's ability to store water pursuant to a contract with an adjudicated
22 groundwater extraction rights holder as permitted by Water Code
23 § 71610(b)(2)(A) and otherwise in accordance with this Judgment.

24 M. Basin Operating Reserve.

25 It is in the public interest and in furtherance of the physical solution for WRD to
26 prudently exercise its statutory discretion to purchase, spread, and inject Replenishment
27 Water, to provide for in-lieu replenishment, and otherwise to fulfill its replenishment
28 function within the Basin as provided in Water Code Section 60000 et. seq. Hydrologic,

1 regulatory and economic conditions now prevailing within the State require that WRD be
2 authorized to exercise reasonable discretion and have flexibility in the accomplishment
3 of its replenishment function. Accordingly, WRD may pre-purchase or defer the
4 purchase of Replenishment Water, and may otherwise purchase and manage available
5 sources of Replenishment Water under the most favorable climatic and economic
6 conditions as it may determine reasonable and prudent under the circumstances. It is the
7 intent of the parties to preserve space for such replenishment activities, including capture
8 of natural inflows during wet years, recapture of water when possible, and artificial
9 replenishment when water is available at discounted rate, for the benefit of the Basin and
10 the parties to the Judgment. The Basin Operating Reserve is intended to allow WRD to
11 meet its replenishment needs to make APA available for extraction by all water rights
12 holders. Accordingly, WRD shall have a priority right to occupy up to 110,000 acre-feet
13 of the Available Dewatered Space as the “Basin Operating Reserve” for the acquisition
14 and replenishment of water, or to ensure space remains available in the Basin to capture
15 natural inflows during wet years for the benefit of the parties to the Judgment, to offset
16 over-production. The priority right is not intended to allow WRD to sell or lease stored
17 water, storage, or water rights. To the extent WRD does not require the use of all of such
18 Basin Operating Reserve, that portion of the Basin Operating Reserve that is not then
19 being used shall be available to other Parties to store water on a temporary and space-
20 available basis. No Party may use any portion of the Basin Operating Reserve for space-
21 available storage unless that Party has already maximized its allowed Storage pursuant to
22 its Individual Storage Allocation and all available Community Storage is already in use.
23 WRD’s failure to use any portion of its Basin Operating Reserve shall not cause
24 forfeiture or create a limitation of its right to make use of the designated space in the
25 future. WRD’s first priority right to this category of space shall be absolute. To the
26 extent that there is a conflict between WRD and a third party regarding the availability of
27 and desire to use any portion of the space available for replenishment up to the maximum
28 limits set forth in this section, the interests of WRD will prevail. If a party other than

1 WRD is using the Basin Operating Reserve space on a “space available” basis and a
2 conflict develops between WRD and the storing party, the storing party will, upon notice
3 from WRD, evacuate the Stored Water within ninety (90) days thereafter. In such event,
4 temporary occupancy within the Basin Operating Reserve shall be first in time, first in
5 right, and the last Party to store water shall be required to evacuate first until adequate
6 space shall be made available within the Basin Operating Reserve to meet WRD’s needs.
7 The storing party or parties assume all risks of waste, spill and loss regardless of the
8 hardship. Stored Water that is not evacuated following WRD’s notice of intent to occupy
9 the Basin Operating Reserve will be deemed dedicated to the Basin Operating Reserve in
10 furtherance of the physical solution without compensation and accounted for
11 accordingly. Nothing herein shall permit WRD to limit or encumber, by contract or
12 otherwise, its right to use the Basin Operating Reserve for Replenishment purposes for
13 any reason, or to make space therein available to any person by any means.
14 Notwithstanding the foregoing, to the extent excess space is available, water evacuated
15 from the Basin Operating Reserve as provided in this Section shall be deemed added to
16 available space within the Individual Storage Allocations and Community Storage Pool,
17 subject to the priority rights otherwise provided in this Judgment.

18 N. Water Augmentation.

19 The parties, in coordination with WRD, may undertake projects that add to the
20 long-term reliable yield of the Basin. Innovations and improvements in practices that
21 increase the conservation and maximization of the reasonable and beneficial use of water
22 should be promoted. To the extent that Parties to the Judgment, in coordination with
23 WRD, implement a project that provides additional long-term reliable water supply to the
24 Central Basin, the annual extraction rights in the Central Basin will be increased
25 commensurately in an amount to be determined by the Storage Panel to reflect the actual
26 yield enhancement associated with the project. Augmented supplies of water resulting
27 from such a project may be extracted or stored as permitted in this Judgment in the same
28 manner as other water. Participation in any Water Rights Augmentation Project shall be

1 voluntary. A party may elect to treat a proposed project as a Water Augmentation
2 Project (for the purpose of seeking an increase in that party's Allowed Pumping
3 Allocation) or may elect to treat such a project as a Storage Project under the other
4 provisions of this Judgment. The terms of participation in any Water Augmentation
5 Project will be at the full discretion of the participating parties. All Water Augmentation
6 Projects will be approved by the Storage Panel.

7 (1) Participating Parties.

8 Parties who propose a Water Augmentation Project ("Project Leads") may
9 do so in their absolute discretion, upon such terms as they may determine. All
10 other parties to this Judgment will be offered an opportunity to participate in the
11 Water Augmentation Project on condition that they share proportionally in
12 common costs and benefits, and assume the obligation to bear exclusively the cost
13 of any improvements that are required to accommodate their individual or
14 particular needs. Notice shall be provided which generally describes the project
15 and the opportunity to participate with sufficient time for deliberation and action
16 by any of these parties who could potentially participate. Disputes over the
17 adequacy of notice shall be referred to the Storage Panel, and then to the Court
18 under its continuing jurisdiction. Parties who elect to participate ("Project
19 Participants") may do so provided they agree to offer customary written and
20 legally binding assurances that they will bear their proportionate costs attributable
21 to the Water Rights Augmentation Project, or provide other valuable
22 consideration deemed sufficient by the Project Leads and the Project Participants.

23 (2) Determination of Additional Extraction Rights.

24 The amount of additional groundwater extraction as a result of a Water
25 Augmentation project will be determined by the Storage Panel, subject to review
26 by the Court. The determination will be based upon substantial evidence which
27 supports the finding that the Water Augmentation project will increase the long-
28 term sustainable yield of the respective Basin by an amount at least equal to the

1 proposed increase in extraction rights.

2 (3) Increase in Extraction Rights.

3 A party that elects to participate and pays that party's full pro-rata share of
4 costs associated with any Water Augmentation Project and/or reaches an
5 agreement with other participants based upon other valuable consideration
6 acceptable to the Project Leads and Project Participants, will receive a
7 commensurate increase in extraction rights. Non-participating parties will not
8 receive an increase or a decrease in extraction rights. Any party that elects not to
9 participate will not be required to pay any of the costs attributable to the particular
10 Water Augmentation Project, whether directly or indirectly as a component of the
11 WRD Replenishment Assessment.

12 (4) Nominal Fluctuations.

13 Because water made available for Water Rights Augmentation will be
14 produced annually, fluctuations in groundwater levels will be temporary, nominal
15 and managed within the Basin Operating Reserve.

16 (5) Availability of New Water.

17 The amount of additional groundwater extraction established as a result of
18 a Water Augmentation Project shall be equal to the quantity of new water in the
19 Basin that is attributable to that Water Augmentation Project. No extraction shall
20 occur and no extraction right shall be established until new water has been
21 actually introduced into the Basin as a result of the Project. Any approval for a
22 Water Augmentation Project shall include provisions (a) requiring regular
23 monitoring to determine the actual amount of such new water made available, (b)
24 requiring make-up water or equivalent payment therefor to the extent that actual
25 water supply augmentation does not meet projections, and (c) adjusting extraction
26 rights attributable to the Water Augmentation Project to match the actual water
27 created. The right to extract augmented water from the Basin resulting from a
28 party's participation in a Water Augmentation Project shall be accounted for

1 separately and shall not be added to a party's Allowed Pumping Allocation. No
2 Replenishment Assessment shall be levied against the extraction of augmented
3 water.

4 (6) Limitation.

5 Notwithstanding the foregoing, WRD will not obtain any water rights or
6 extraction rights under this Judgment by virtue of its participation in a Water
7 Augmentation Project. If WRD participates in a Water Rights Augmentation
8 Project through funding or other investments, its allocation of new water from the
9 project shall be used to offset its replenishment responsibilities.

10 O. Limits on Watermaster Review.

11 It shall not be necessary for Watermaster, or any constituent body thereof, to
12 review or approve any of the following before the affected Party may proceed: (i)
13 exercise of adjudicated water rights consistent with this Judgment, except for extraction
14 above 140% of a Party's extraction right as set out in Section IV(J) of this Judgment; (ii)
15 replenishment of the Basin with Replenishment Water by WRD consistent with Water
16 Code Section 60000 et seq., including replenishment of water produced by water rights
17 holders through the exercise of adjudicated water rights; (iii) WRD's operations within
18 the Basin Operating Reserve; (iv) Carryover Conversion or other means of the filling of
19 the Individual Storage Accounts and the Community Storage Pool, as provided in this
20 Judgment, as long as existing water production, spreading, or injection facilities are used;
21 and (v) individual transfers of the right to produce Stored Water as permitted in Section
22 IV(F). All other Storage Projects and all Water Augmentation Projects shall be subject
23 to review and approval as provided herein, including (i) material variances to substantive
24 criteria governing projects exempt from the review and approval process, (ii)
25 modifications to previously approved Storage Projects and agreements, (iii) a party's
26 proposal for Carryover Conversion in quantities greater than the express apportionment
27 of Adjudicated Storage Capacity on a non-priority, space-available, interim basis, and
28 (iv) Storage, by means other than Carryover Conversion, when new production,

1 spreading, or injection facilities are proposed to be utilized.

2 P. Hearing Process For Watermaster Review.

3 The following procedures shall be followed by Watermaster where Watermaster
4 review of storage or extraction of Stored Water is required or permitted under this
5 Judgment:

6 (1) No later than thirty (30) days after notice has been issued for the
7 storage application, the matter shall be set for hearings before the Storage Panel.
8 A staff report shall be submitted by WRD staff in conjunction with the completed
9 storage application documents and the Water Rights Panel may prepare an
10 independent staff report, if it elects to do so.

11 (2) The Board of WRD and the Water Rights Panel (sitting jointly as
12 the Storage Panel) shall conduct a joint hearing concerning the storage
13 application.

14 (3) All Watermaster meetings shall be conducted in the manner
15 prescribed by the applicable Rules and Regulations. The Rules shall provide that
16 all meetings of Watermaster shall be open to water rights holders and that
17 reasonable notice shall be given of all meetings.

18 (4) The Board of WRD and the Water Rights Panel shall each adopt
19 written findings explaining its decision on the proposed Storage Project, although
20 if both entities reach the same decision on the Storage Project, they shall work
21 together to adopt a uniform set of findings.

22 (5) Unless both the Board of WRD and the Water Rights Panel
23 approve the Storage Project, the Storage Project application shall be deemed
24 denied (a "Project Denial"). If both the Board of WRD and the Water Rights
25 Panel approve the Storage Project, the Storage Project shall be deemed approved
26 (a "Project Approval").

27 Q. Trial Court Review

28 (1) The applicant may seek the Storage Panel's reconsideration of a

1 Project Denial. However, there shall be no process for mandatory reconsideration
2 or mediation of a Project Approval or a Project Denial either before the
3 Administrative Body, or before the Water Rights Panel.

4 (2) Any Party may file an appeal from a Project Approval or Project
5 Denial with this Court, as further described in Section II(F).

6 (3) In order to (a) promote the full presentation of all relevant
7 evidence before the Storage Panel in connection with its consideration of any
8 proposed Storage Project, (b) achieve an expeditious resolution of any appeal to
9 the Court, and (c) accord the appropriate amount of deference to the expertise of
10 the Storage Panel, the appeal before the Court shall be based solely on the
11 administrative record, subject only to the limited exception in California Code of
12 Civil Procedure section 1094.5(e).

13 (4) If both the WRD Board and the Water Rights Panel each vote to
14 deny or approve a proposed Storage Project, it shall be an action by the Storage
15 Panel and that decision shall be accorded by the Court deference according to the
16 substantial evidence test. If one of the reviewing bodies votes to approve the
17 proposed Storage Project and the other reviewing body votes to deny the proposed
18 storage project, then the Court's review shall be *de novo*, although still restricted
19 to the administrative record. In the case of any *de novo* Trial Court review, the
20 findings made by the respective Watermaster bodies shall not be accorded any
21 weight independent of the evidence supporting them.

22 R. Space Available Storage, Relative Priority, and Dedication of "Spilled"
23 Water.

24 To balance the need to protect priority uses of storage and to encourage the full
25 utilization of Available Dewatered Space within the Adjudicated Storage Capacity and
26 the Basin Operating Reserve, any Party may make interim, temporary use of then
27 currently unused Available Dewatered Space within any category of Adjudicated Storage
28 Capacity, and then if all Adjudicated Storage Capacity is being fully used for Stored

1 Water within the Basin Operating Reserve (“Space-Available Storage”), subject to the
2 following criteria:

3 (1) Any Party may engage in Space-Available Storage without prior
4 approval from Watermaster provided that the storing Party or Parties shall assume
5 all risks of waste, spill, and loss regardless of the hardship. Whenever the Storage
6 Panel determines that a Party is making use of excess Available Dewatered Space
7 for Space-Available Storage, the Storage Panel shall issue written notice to the
8 Party informing them of the risk of spill and loss.

9 (2) Whenever the Available Dewatered Space is needed to
10 accommodate the priority use within a respective category of Adjudicated Storage
11 Capacity, or WRD seeks to make use of its priority right to the Basin Operating
12 Reserve to fulfill its replenishment function, the Storage Panel shall issue a notice
13 to evacuate the respective category of Adjudicated Storage Capacity or Basin
14 Operating Reserve, as applicable, within the time-periods set forth within this
15 Amended Judgment. To the extent the Stored Water is not timely evacuated such
16 Stored Water will be placed into any other excess Available Dewatered Space,
17 first within the Adjudicated Storage Capacity, if available, and then if all
18 Adjudicated Storage Capacity is being fully used for Stored Water within the
19 Basin Operating Reserve. If no excess Available Dewatered Space is available
20 within the Basin Operating Reserve, then the Stored Water shall be deemed
21 spilled and will be deemed dedicated to the Basin Operating Reserve in
22 furtherance of the physical solution without compensation and accounted for
23 accordingly. A Party that seeks to convert the Stored Water temporarily held in
24 interim storage as Space-Available Storage to a more firm right, may in its
25 discretion, contract for the use of another Party’s Individual Storage Allocation,
26 or may add such water to the Community Storage Pool once space therein
27 becomes available.

28 (3) No Stored Water will be deemed abandoned unless the cumulative

1 quantity of water held as Stored Water plus the quantity of water held in the Basin
2 Operating Reserve exceeds 330,000 (three hundred and thirty thousand) acre-feet
3 in the Central Basin.
4

5 V. CONTINUING JURISDICTION OF THE COURT.

6 The Court hereby reserves continuing jurisdiction and upon application of any interested
7 party, or upon its own motion, may review and redetermine the following matters and any
8 matters incident thereto:

9 A. Its determination of the permissible level of extractions from Central
10 Basin in relation to achieving a balanced basin and an economic utilization of Central
11 Basin for groundwater storage, taking into account any then anticipated artificial
12 replenishment of Central Basin by governmental agencies for the purpose of alleviating
13 what would otherwise be annual overdrafts upon Central Basin and all other relevant
14 factors.

15 B. Whether in accordance with applicable law any party has lost all or any
16 portion of his rights to extract groundwater from Central Basin and, if so, to ratably
17 adjust the Allowed Pumping Allocations of the other parties and ratably thereto any
18 remaining Allowed Pumping Allocation of such party.

19 C. To remove any Watermaster or constituent body appointed from time to
20 time and appoint a new Watermaster; and to review and revise the duties, powers and
21 responsibilities of the Watermaster or its constituent bodies and to make such other and
22 further provisions and orders of the Court that may be necessary or desirable for the
23 adequate administration and enforcement of the Judgment.

24 D. To revise the price to be paid by Exchangees and to Exchangors for
25 Exchange Pool purchases and subscriptions.

26 E. In case of emergency or necessity, to permit extractions from Central
27 Basin for such periods as the Court may determine: (i) ratably in excess of the Allowed
28 Pumping Allocations of the parties; or (ii) on a non-ratable basis by certain parties if

1 either compensation or other equitable adjustment for the benefit of the other parties is
2 provided. Such overextractions may be permitted not only for emergency and necessity
3 arising within Central Basin area, but to assist the remainder of the areas within The
4 Metropolitan Water District of Southern California in the event of temporary shortage or
5 threatened temporary shortage of its imported water supply, or temporary inability to
6 deliver the same throughout its area, but only if the court is reasonably satisfied that no
7 party will be irreparably damaged thereby. Increased energy cost for pumping shall not
8 be deemed irreparable damage. Provided, however, that the provisions of this
9 subparagraph will apply only if the temporary shortage, threatened temporary shortage,
10 or temporary inability to deliver was either not reasonably avoidable by the Metropolitan
11 Water District, or if reasonably avoidable, good reason existed for not taking the steps
12 necessary to avoid it.

13 F. To review actions of the Watermaster.

14 G. To assist the remainder of the areas within The Metropolitan Water
15 District of Southern California within the parameter set forth in subparagraph (e) above.

16 H. To provide for such other matters as are not contemplated by the Judgment
17 and which might occur in the future, and which if not provided for would defeat any or
18 all of the purposes of this Judgment to assure a balanced Central Basin subject to the
19 requirements of Central Basin Area for water required for its needs, growth and
20 development.

21 The exercise of such continuing jurisdiction shall be after 30 days' notice to the parties,
22 with the exception of the exercise of such continuing jurisdiction in relation to subparagraphs E
23 and G above, which may be *ex parte*, in which event the matter shall be forthwith reviewed
24 either upon the Court's own motion or the motion of any party upon which 30 days' notice shall
25 be so given. Within ten (10) days of obtaining any *ex parte* order, the party so obtaining the
26 same shall mail notice thereof to the other parties. If any other party desires Court review
27 thereof, the party obtaining the *ex parte* order shall bear the reasonable expenses of mailing
28 notice of the proceedings, or may in lieu thereof undertake the mailing. Any contrary or

1 modified decision upon such review shall not prejudice any party who relied on said *ex parte*
2 order.

3
4 VI. GENERAL PROVISIONS.

5 A. Judgment Constitutes Inter Se Adjudication.

6 This Judgment constitutes an inter se adjudication of the respective rights of all
7 parties, except as may be otherwise specifically indicated in the listing of the water rights
8 of the parties of this Judgment, or in Appendix “2” hereof. All parties to this Judgment
9 retain all rights not specifically determined herein, including any right, by common law
10 or otherwise, to seek compensation for damages arising out of any act or omission of any
11 person. This Judgment constitutes a “court order” within the meaning of Water Code
12 Section 71610(B)(2)(b).

13 B. Assignment, Transfer, Etc., of Rights.

14 Subject to the other provision of this Judgment, and any rules and regulations of
15 the Watermaster requiring reports relative thereto, nothing herein contained shall be
16 deemed to prevent any party hereto from assigning, transferring, licensing or leasing all
17 or any portion of such water rights as it may have with the same force and effect as
18 would otherwise be permissible under applicable rules of law as exist from time to time.

19 C. Service Upon and Delivery to Parties of Various Papers.

20 Service of the Judgment on those parties who have executed that certain
21 Stipulation and Agreement for Judgment or who have filed a notice of election to be
22 bound by the Exchange Pool provisions shall be made by first class mail, postage
23 prepaid, addressed to the designee and at the address designated for that purpose in the
24 executed and filed Counterpart of the Stipulation and Agreement for Judgment or in the
25 executed and filed “Notice of Election to be Bound by Exchange Pool Provisions,” as the
26 case may be, or in any substitute designation filed with the Court.

27 Each party who has not heretofore made such a designation shall, within 30 days
28 after the Judgment shall have been served upon that party, file with the Court, with proof

1 of service of a copy upon the Watermaster, a written designation of the person to whom
2 and the address at which all future notices, determinations, requests, demands, objections,
3 reports and other papers and processes to be served upon that party or delivered to that
4 party are to be so served or delivered.

5 A later substitute designation filed and served in the same manner by any party
6 shall be effective from the date of filing as to the then future notices, determinations,
7 requests, demands, objections, reports and other papers and processes to be served upon
8 or delivered to that party.

9 Delivery to or service upon any party by the Watermaster, by any other party, or
10 by the Court, or any item required to be served upon or delivered to a party under or
11 pursuant to the Judgment may be by deposit in the mail, first class, postage prepaid,
12 addressed to the designee and at the address in the latest designation filed by that party.

13 D. Judgment Does Not Affect Rights, Powers, Etc., of Plaintiff District.

14 Nothing herein constitutes a determination or adjudication which shall foreclose
15 Plaintiff District from exercising such rights, powers, privileges and prerogatives as it
16 may now have or may hereafter have by reason of provisions of law.

17 E. Continuation of Order under Interim Agreement.

18 The order of Court made pursuant to the “Stipulation and Interim Agreement and
19 Petition for Order” shall remain in effect through the Administrative Year in which this
20 Judgment shall become final (subject to the reserved jurisdiction of the Court).

21 F. Effect of Extractions by Exchangees; Reductions in Extractions.

22 With regard to Exchange Pool purchases, the first extractions by each Exchangee
23 shall be deemed the extractions of the quantities of water which that party is entitled to
24 extract pursuant to his allocation from the Exchange Pool for that Administrative Year.
25 Each Exchangee shall be deemed to have pumped his Exchange Pool request so allocated
26 for and on behalf of each Exchangor in proportion to each Exchangor’s subscription to
27 the Exchange Pool which is utilized to meet Exchange Pool requests. No Exchangor
28 shall ever be deemed to have relinquished or lost any of its rights determined in this

1 Judgment by reason of allocated subscriptions to the Exchange Pool. Each Exchangee
2 shall be responsible as between Exchangors and that Exchangee, for any tax or
3 assessment upon the production of groundwater levied for replenishment purposes by
4 WRD or by any other governmental agency with respect to water extracted by such
5 Exchangee by reason of Exchange Pool allocations and purchases. No Exchangor or
6 Exchangee shall acquire any additional rights, with respect to any party to this action, to
7 extract waters from Central Basin pursuant to Water Code Section 1005.1 by reason of
8 the obligations pursuant to and the operation of the Exchange Pool.

9 G. Judgment Binding on Successors, Etc.

10 This Judgment and all provisions thereof are applicable to and binding upon not
11 only the parties to this action, but as well to their respective heirs, executors,
12 administrators, successors, assigns, lessees, licensees and to the agents, employees and
13 attorneys in fact of any such persons.

14 H. Costs.

15 No party shall recover its costs herein as against any other party.

16 I. Intervention of Successors in Interest and New Parties.

17 Any person who is not a party (including but not limited to successors or parties
18 who are bound by this Judgment) and who proposes to produce water from the Basin,
19 store water in the Basin, or exercise water rights of a predecessor may seek to become a
20 party to this Judgment through a Stipulation in Intervention entered into with the
21 Plaintiff. Plaintiff may execute said Stipulation on behalf of the other parties herein, but
22 such Stipulation shall not preclude a party from opposing such intervention at the time of
23 the court hearing thereon. Said Stipulation for Intervention must thereupon be filed with
24 the Court, which will consider an order confirming said intervention following thirty (30)
25 days' notice to the parties. Thereafter, if approved by the Court, such intervenor shall be
26 a party bound by this Judgment and entitled to the rights and privileges accorded under
27 the physical solution herein.

28 J. Effect of this Amended Judgment on Orders Filed Herein.

1 This Third Amended Judgment shall not abrogate such rights of additional
2 carryover of unused water rights as may otherwise exist pursuant to orders herein filed
3 June 2, 1977 and September 29, 1977.
4

5 THE CLERK WILL ENTER THIS THIRD AMENDED JUDGMENT FORTHWITH.
6

7 DATED: 12-23-13
8

9 ABRAHAM KHAN
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11 Judge of the Superior Court
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APPENDIX 1
Description of Central Basin Area

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That certain area in the County of Los Angeles, State of California, situated within the following exterior boundaries:

1. Commencing at the southernmost corner of the basin at a point on the Los Angeles-Orange County boundary 2,000 feet, more or less, northeasterly of the intersection of the center line of Pacific Coast Highway with said County boundary;
2. Thence in a straight line along the trace of the Reservoir Hill Fault to a point about 650 feet north and about 700 feet east of the intersection of Anaheim Street and Ximeno Avenue;
3. Thence in a straight line along the trace of said Reservoir Hill Fault to a point on the center line of Pacific Coast Highway, 650 feet west of the intersection of the center lines of said Pacific Coast Highway and Lakewood Boulevard;
4. Thence westerly along the center line of said Pacific Coast Highway to a point 300 feet west of its intersection with the center line of Obispo Avenue;
5. Thence in a straight line to a point about 400 feet east of the intersection of the center lines of Walnut and Creston Avenues;
6. Thence in a straight line along the escarpment of the Cherry Hill Fault to a point about 750 feet west and about 730 feet south of the intersection of Wardlow Road and Long Beach Boulevard;
7. Thence in a straight line to a point about 100 feet north and about 100 feet west of the intersection of Bixby Road and Del Mar Avenue;
8. Thence in a straight line extending through a point in the center line of Del Amo Boulevard about 900 feet west of the center line of the Pacific

APPENDIX "I"

Page 1
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Electric Railway to a point in the center line of Alameda Street about 2,900 feet north of Del Amo Boulevard, the latter distance measured along the center line of Alameda Street;

9. Thence in a straight line along the crest of the Dominguez Hills to a point about 1,300 feet north and about 850 feet west of the intersection of the center lines of Central Avenue and Victoria Street;

10. Thence in a straight line along the escarpment of the Avalon-Compton Fault to a point about 700 feet west of the intersection of the center lines of Avalon Boulevard and Rosecrans Avenue;

11. Thence in a straight line to a point 400 feet north of the intersection of El Segundo Boulevard and Vermont Avenue and continuing in another straight line to a point 2,400 feet south and 1,000 feet east of the intersection of the center lines of Crenshaw and Century Boulevards, the latter point being the approximate southeasterly end of the escarpment of the Potrero Fault;

12. Thence in a straight line along the escarpment of the Potrero Fault and continuing to a point on Northridge Drive about 200 feet northeasterly of its intersection with Marvale Drive, measured along the center line of Northridge Drive;

13. Thence in a straight line to a point on the center line of Stocker Street 1,800 feet, more or less, northeasterly of the intersection of the center lines of Stocker Street and La Brea Avenue, measured along the center line of Stocker Street;

14. Thence easterly along said last mentioned center line and continuing along said center line, following the same in all its various courses and curves to its first intersection with the boundary line of said City of Los Angeles, being a boundary line in that certain annexation to the City of Los Angeles on April 22, 1948, designated Angeles Mesa Addition No. 5;

15. Thence southeasterly along said boundary line of the City of Los Angeles and continuing along the boundary line of said City of Los Angeles, following the same in all its various courses and curves, to an angle point in said boundary line of the City of Los Angeles being also an angle point in the boundary line of that certain territory annexed to the City of Los Angeles September 18, 1946 and known as Mesa Addition No. 3, said angle point being at the intersection of the southeasterly line of Stocker Avenue, 80 feet wide, as said Stocker Avenue is described in deed to the County of Los Angeles, recorded in Book 13445, page 197, of Official Records, in the office of said Recorder, with the westerly boundary line of that certain territory annexed to the City of Los Angeles July 27, 1922 and known as the Angeles Mesa Addition;

16. Thence northeasterly in a direct line to the intersection of the center line of Stocker Avenue, 80 feet wide, as shown on map of Tract No. 10023, recorded in Book 150, page 46, of Maps, in the office of said Recorder, with that certain center line of Crenshaw Boulevard, formerly Angeles Mesa Drive, 60 feet wide, shown on said map of Tract No. 10023 as the center line of Angeles Mesa Drive per book 6053, page 120, of Deeds;

17. Thence northerly along said certain center line of Crenshaw Boulevard, formerly Angeles Mesa Drive, 60 feet wide, to the southerly line of the northerly 30 feet of Santa Barbara Avenue, 75 feet wide, shown on said map of Tract No. 10023 as the line described in deed recorded in Book 347, page 35, of Official Records;

18. Thence easterly along said line shown on said map of Tract No. 10023 as the line described in deed recorded in Book 347, page 35, of Official Records, to the easterly terminus thereof as shown on said map;

19. Thence northerly in a direct line to the southwesterly corner of Lot 273, Tract No. 809, as shown on map recorded in Book 16, page 74, of Maps, in the office of said Recorder, said southwesterly corner of Lot 273 being a point on the northerly line of the north roadway, 30 feet wide, of Santa Barbara Avenue, as shown on said last mentioned map;

20. Thence easterly along said northerly line of the north roadway, 30 feet wide, of Santa Barbara Avenue, to the southeasterly corner of Lot 52 of said Tract No. 809;

21. Thence in a direct line to the southwesterly corner of Lot 280, Tract No. 4463, as shown on map recorded in Book 48, page 31, of Maps, in the office of said Recorder, said southwesterly corner of Lot 280 being a point in the northerly line of the north roadway of Santa Barbara Avenue as shown on said last mentioned map;

22. Thence easterly along said northerly line of the north roadway of Santa Barbara Avenue to the southeasterly corner of Lot 39 of said Tract No. 4463;

23. Thence continuing easterly along said northerly line of the north roadway of Santa Barbara Avenue to the westerly line of Western Avenue, 60 feet wide, as shown on said map of Tract No. 4463;

24. Thence easterly in a direct line to the intersection of the easterly line of Western Avenue, 60 feet wide, with the northerly line of the north roadway of Santa Barbara Avenue, as said intersection is shown on map of Tract No. 2583, recorded in Book 32, page 58, of Maps, in the office of said Recorder;

25. Thence easterly along said northerly line of the north roadway of Santa Barbara Avenue to its intersection with the westerly line of Denker Avenue, 60 feet wide, as shown on said map of Tract No. 2583;

26. Thence easterly in a direct line to the southwesterly corner of Lot 7 of Dalton Avenue Square as shown on map recorded in Book 14, page 116, of Maps, in the office of said Recorder, said southwesterly corner being a point in the northerly line of the north roadway, 20 feet wide, of Santa Barbara Avenue, as shown on said last mentioned map;

27. Thence easterly along said northerly line of the north roadway, 20 feet wide, of Santa Barbara Avenue, to the southeasterly corner of Lot 56 of said Dalton Avenue Square;

28. Thence easterly in a direct line to the intersection of the center line of Normandie Avenue, 60 feet wide, with the southerly line of the northerly 30 feet of the north roadway, 45 feet wide, of Santa Barbara Avenue, as said intersection is shown on map of Tract No. 11593, recorded in Book 247, page 42, of Maps, in the office of said Recorder;

29. Thence easterly along said southerly line of the northerly 30 feet of the north roadway, 45 feet wide, of Santa Barbara Avenue to the center line of Vermont Avenue, 80 feet wide, as shown on said map of Tract No. 11593;

30. Thence easterly in a direct line to the southwesterly corner of Lot 10, Tract No. 2411, as shown on map recorded in Book 26, Page 77, of Maps, in the office of said Recorder, said southwesterly corner of Lot 10 being a point on the northerly line of the north roadway of Santa Barbara Avenue, as shown on said last mentioned map;

31. Thence easterly along said northerly line of the north roadway of Santa Barbara Avenue to the southeasterly corner of Lot 7 of said Tract No. 2411;

32. Thence easterly in a direct line to the southwesterly corner of Lot 1, Block A of Tract No. 4719, as shown on map recorded in Book 52, page 48, of Maps, in the office of said Recorder, said southwesterly corner of Lot 1, Block A, being a point on the northerly line of the north roadway of Santa Barbara Avenue as shown on said last mentioned map;

33. Thence easterly along said northerly line of the north roadway of Santa Barbara Avenue to the southeasterly corner of Lot 1, Block B, of said Tract No. 4719;

34. Thence southeasterly in a direct line to the intersection of the center line of Figueroa Street, 100 feet wide, with the center line of Santa Barbara Avenue, 60 feet wide, as said intersection is shown on Map of Bowen and Chamberlin's Main and Figueroa Street Tract No. 2, recorded in Book 7, page 5, of Maps, in the office of said Recorder;

35. Thence easterly along said center line of Santa Barbara Avenue, 60 feet wide, as shown on said map of Bowen and Chamberlin's Main and Figueroa Street Tract No. 2, to the center line of Broadway Place, formerly Moneta Avenue, 76 feet wide, as shown on said last mentioned map;

36. Thence easterly along the northerly line of the southerly 30 feet of Santa Barbara Avenue as shown on map of Main Street Boulevard Tract, recorded in Book 5, page 32, of Maps, in the office of said Recorder, to the center line of Main Street, 80 feet wide, as shown on said last mentioned map;

37. Thence easterly along the center line of Santa Barbara Avenue, 60 feet wide, as shown on Map of South Woodlawn, recorded in Book 4, page 5, of Maps, in the office of said Recorder, to the southeasterly line of the northwesterly 40 feet of San Pedro Street, as shown on said last mentioned Map;

38. Thence along said southeasterly line of the northwesterly 40 feet of San Pedro Street as shown on said Map of South Woodlawn to the center line of Santa Barbara Avenue, formerly Defiance Street, 60 feet wide, as shown on map of the Mettler Tract, recorded in Book 6, page 50, of Maps, in the office of said Recorder;

39. Thence easterly along said center line of Santa Barbara Avenue, formerly Defiance Street, 60 feet wide, to the center line of Griffith Avenue, 60 feet wide, as said Griffith Avenue is shown on said map of the Mettler Tract;

40. Thence southeasterly in a direct line to the point of intersection of the westerly line of McKinley Avenue, formerly Eureka Street, with the westerly prolongation of the center line of Santa Barbara Avenue, formerly Reno Street, 60 feet wide, as said streets are shown on Map of the Nadeau Orange Tract, recorded in Book 25, page 34, of Miscellaneous Records, in the office of said Recorder;

41. Thence easterly along said westerly prolongation and along said center line of Santa Barbara Avenue, formerly Reno Street, 60 feet wide, as said street is shown on said Map of the Nadeau Orange Tract, and continuing easterly along the easterly prolongation of said center line to the easterly line of Central Avenue, 80 feet wide, as shown on Map of Lienau's

Cottage Home Tract, recorded in Book 28, page 48, of Miscellaneous Records, in the office of said Recorder;

42. Thence northerly along said easterly line of Central Avenue, 80 feet wide, as shown on said map of Lienau's Cottage Home Tract, to the northwesterly corner of Lot 11, Block 1, of said Lienau's Cottage Home Tract; said northwesterly corner of Lot 11 being a point on the southerly line of Santa Barbara Avenue, formerly Herbert Street, as shown on said last mentioned map;

43. Thence easterly along said southerly line of Santa Barbara Avenue, formerly Herbert Street, to the northeasterly corner of Lot 1, Block 1, of said Lienau's Cottage Home Tract;

44. Thence easterly in a direct line to the northwesterly corner of Lot 1 of the Oakley's Home Tract, as shown on map recorded in Book 5, page 18, of Maps, in the office of said Recorder, said northwesterly corner of Lot 1 being a point on the southerly line of Santa Barbara Avenue, formerly 36th Street, 60 feet wide, as shown on said last mentioned map;

45. Thence easterly along said southerly line of Santa Barbara Avenue, formerly 36th Street, 60 feet wide, as shown on said map of Oakley's Home Tract and continuing easterly along the easterly prolongation of said southerly line to the westerly line of that certain tract of land shown on Plat Showing the Property of George Stephenson, recorded in Book 53, page 31, of Miscellaneous Records, in the office of said Recorder;

46. Thence southerly along said westerly line of said certain tract of land shown on Plat Showing the Property of George Stephenson to the southerly line of said certain tract of land, said southerly line being shown on said Plat as having a bearing of S 81° E and a distance of 7.03 chains;

47. Thence easterly along said southerly line of said certain tract of land to the southeasterly line of said certain tract of land, said southeasterly line being shown on said Plat as having a bearing of N 25° E and a distance of 18.84 chains;

48. Thence northeasterly along said southeasterly line of said certain tract of land, being also along the northwesterly line of Compton Avenue, formerly Orange Street, 60 feet wide, as shown on said Plat, to the westerly prolongation of the center line of Santa Barbara Avenue, formerly 30th Street, 60 feet wide, as shown on map of the Deeble Tract, recorded in Book 9, page 188, of Maps, in the office of said Recorder;

49. Thence easterly along said westerly prolongation and along said center line of Santa Barbara Avenue, formerly 30th Street, 60 feet wide, as

shown on said map of the Deeble Tract, to the westerly line of The Morgan Tract, as shown on map recorded in Book 5, page 5, of Maps, in the office of said Recorder;

50. Thence easterly in a direct line to the point of intersection of the easterly line of said Morgan Tract with the center line of Santa Barbara Avenue, formerly 30th Street, 50 feet wide, as said street is shown on Map of East Jefferson Street Tract No. 2, recorded in Book 7, page 92, of Maps, in the office of said Recorder;

51. Thence easterly along said center line of Santa Barbara Avenue, formerly 30th Street, 50 feet wide, and continuing easterly along the easterly prolongation of said center line of Santa Barbara Avenue to the east line of the west roadway, 40 feet wide, of Long Beach Avenue as shown on said map of East Jefferson Street Tract No. 2;

52. Thence easterly in a direct line to the point of intersection of the westerly line of the east roadway, 40 feet wide, of Long Beach Avenue as shown on Map of East Jefferson Street Tract No. 1, recorded in Book 7, page 113, of Maps, in the office of said Recorder, with the westerly prolongation of the center line of Santa Barbara Avenue, formerly 30th Street, 50 feet wide, as said street is shown on said last mentioned Map;

53. Thence easterly along said westerly prolongation and along said center line of Santa Barbara Avenue, formerly 30th Street, 50 feet wide, and continuing easterly along the easterly prolongation of said center line to the first intersection with the boundary line of the City of Los Angeles, said intersection being in Alameda Street;

54. Thence northerly and easterly along said boundary line of the City of Los Angeles to the easterly line of Alameda Street, 80 feet wide, as shown on map of Huntington Industrial Tract recorded in Book 6, page 10, of Maps, in the office of said Recorder;

55. Thence northerly along said easterly line of Alameda Street, 80 feet wide, as shown on said map of Huntington Industrial Tract to the north-westerly corner of Block A of said Huntington Industrial Tract;

56. Thence in a direct line to the southeasterly corner of Lot 73 of the Weiss Tract No. 2, as shown on map recorded in Book 2, page 42, of Maps, in the office of said Recorder, said southeasterly corner of Lot 73 being a point on the westerly line of Alameda Street, 80 feet wide, as shown on said last mentioned map;

57. Thence northerly along said westerly line of Alameda Street, 80 feet wide, to the northeasterly corner of Lot 62 of said Weiss Tract No. 2.

58. Thence northerly in a direct line to the southeasterly corner of Lot 189, Block A, of the Meade and Dalton Tract, as shown on map recorded in Book 37, page 50, of Miscellaneous Records, in the office of said Recorder, said southeasterly corner of Lot 189 being a point on the westerly line of Alameda Street, 80 feet wide, as shown on said last mentioned map;

59. Thence northerly along said westerly line of Alameda Street, 80 feet wide, to the northeasterly corner of Lot 1, Block A, of said Meade and Dalton Tract;

60. Thence easterly along the easterly prolongation of the northerly line of said Lot 1, Block A, of the Meade and Dalton Tract to the easterly line of Alameda Street, 80 feet wide, as shown on map of the Central Industrial Tract, recorded in Book 4, page 21, of Maps, in the office of said Recorder;

61. Thence northerly along said easterly line of Alameda Street, 80 feet wide, to the northwesterly corner of said Central Industrial Tract;

62. Thence continuing northerly along the easterly line of Alameda Street, 80 feet wide, as shown on map of the Hughes Manufacturing Co.'s Tract, recorded in Book 7, page 105, of Maps, in the office of said Recorder, to the southwesterly corner of Lot 7, Block A, of Ninth Street Tract Extension, as shown on map recorded in Book 55, page 89, of Miscellaneous Records, in the office of said Recorder;

63. Thence continuing northerly along the easterly line of Alameda Street as shown on said map of Ninth Street Tract Extension to northwesterly corner of Lot 1, Block A, of said Ninth Street Extension, said northwesterly corner of Lot 1 being a point on the easterly line of Alameda Street as shown on map of H. N. Elliott's Ninth Street Tract, recorded in Book 53, page 98, of Miscellaneous Records, in the office of said Recorder;

64. Thence continuing northerly along said easterly line of Alameda Street as shown on said map of H. N. Elliott's Ninth Street Tract and continuing northerly along the northerly prolongation of said easterly line to that certain line designated City Engineer's center line of Olympic Boulevard on map of Tract No. 11512, recorded in Book 221, page 29, of Maps, in the office of said Recorder;

65. Thence easterly along said certain line designated City Engineer's center line of Olympic Boulevard to the intersection with the center line of Mateo Street, as shown on said map of Tract No. 11512, said intersection being also shown on map of Tract No. 10068, recorded in Book 141, page 44, of Maps, in the office of said Recorder, as the intersection of the city center lines of Mateo Street, 60 feet wide, and Olympic Boulevard, formerly Ninth Street, 80 feet wide;

66. Thence continuing easterly along said city center line of Olympic Boulevard, formerly Ninth Street, 80 feet wide, to the intersection with the westerly prolongation of that certain center line of Olympic Boulevard shown on map filed in Book 52, page 5, of Record of Surveys, in the office of said Recorder, as having a bearing of North $89^{\circ} 33' 00''$ West;

67. Thence easterly along said westerly prolongation and continuing easterly along said certain center line of Olympic Boulevard, shown on said map filed in Book 52, page 5, of Record of Surveys, as having a bearing of North $89^{\circ} 33' 00''$ West, to the westerly line of the Official Bed of the Los Angeles River, as shown on said last mentioned map;

68. Thence easterly in a direct line to a point on the easterly line of the Official Bed of the Los Angeles River as shown on map of Tract No. 12316, recorded in Book 263, page 5, of Maps, in the office of said Recorder, said point being at the westerly terminus of that certain course of the center line of Olympic Boulevard shown on said last mentioned map as having a bearing of North $89^{\circ} 21'$ West and a distance of 214.13 feet;

69. Thence easterly along said center line of Olympic Boulevard and continuing easterly along the center line of Olympic Boulevard as shown on said map of Tract No. 12316 to the intersection with the center line of that portion of Rio Vista Avenue, 60 feet wide, extending northerly from said Olympic Boulevard, as shown on said map of Tract No. 12316, said intersection being also shown on map of Tract No. 6783 recorded in Book 99, page 77, of Maps, in the office of said Recorder, as the intersection of Olympic Boulevard, formerly Ninth Street, 100 feet wide, with said center line of Rio Vista Avenue;

70. Thence southeasterly along said center line of Olympic Boulevard, formerly Ninth Street, 100 feet wide, and continuing southeasterly along said center line to the intersection with the center line of Mines Avenue, as shown on said map of Tract No. 6783;

71. Thence easterly along said center line of Olympic Boulevard to the intersection with the center line of Lorena Street, 82.50 feet wide, as shown on said map of Tract No. 6783;

72. Thence easterly in a direct line to the most westerly corner of Lot 636 of Tract No. 941, as shown on map recorded in Book 16, pages 194 and 195, of Maps, in the office of said Recorder, said most westerly corner being a point on the southerly boundary line of said Tract No. 941;

73. Thence easterly along said southerly boundary line of Tract No. 941 to the most easterly corner of Lot 480 of said Tract No. 941;

74. Thence easterly in a direct line to the intersection of the north-easterly line of Hollenbeck Avenue, 82.50 feet wide, as shown on said map of Tract No. 941, with the southerly boundary line of said Tract No. 941;

75. Thence easterly along said last mentioned southerly boundary line of Tract No. 941 to the boundary line of the City of Los Angeles;

76. Thence northerly and easterly along the boundary line of the City of Los Angeles to an angle point in the boundary line, said point also being a point in the boundary of the City of Monterey Park, at the northwest corner of Section 29, Township 1 South, Range 12 West, S.B.B. & M.;

77. Thence southerly along the boundary line of said City of Monterey Park and continuing along the boundary line of said City of Monterey Park, following all its various courses and curves, to its first intersection with the boundary line of the City of Montebello, said intersection being in Pomona Boulevard (formerly Third Street) between Gerhart Avenue and Bradshaw Avenue; at the north quarter section corner of fractional Section 4, Township 2 South, Range 12 West, S.B.B. & M., as shown on map of the Repetto Rancho recorded in Book 759, pages 21 and 22, of Deeds, in the Office of the Recorder of the County of Los Angeles;

78. Thence easterly along the common boundary line of said City of Monterey Park and said City of Montebello to the easterly terminus of said common boundary line, said easterly terminus being at the intersection of said common boundary line with the southwesterly line of Rancho La Merced, as shown on map recorded in Book 13, page 24, of Patents, in the office of said Recorder, and being in the south line of Township 1 South, Range 12 West, S.B.B. & M.;

79. Thence easterly along the boundary line of said City of Monterey Park and said south line of Township 1 South, Range 12 West, S.B.B. & M., to an angle point in said boundary line of the City of Monterey Park;

80. Thence easterly along said south line of Township 1 South, Range 12 West, S.B.E. & M., to the easterly line of Tract No. 10063 as shown on map recorded in Book 179, pages 32 to 34, inclusive, of Maps, in the office of said Recorder;

81. Thence southerly along said easterly line of Tract No. 10063 to its first intersection with the boundary line of said City of Montebello;

82. Thence easterly along the boundary line of said City of Montebello and continuing along the boundary line of said City of Montebello, following all its various courses and curves, to its intersection with the Compromised Dividing Line between the Rancho Paso de Bartolo on the South Side and the Ranchos La Puente, Potrero de Felipe Lugo and La Merced on the North Side, as shown on map filed in Book 1, page 73, Record of Surveys, in the office of said Recorder;

83. Thence easterly along said Compromised Dividing Line to a point thereon, distant 1068.62 feet westerly, measured along said Compromised Dividing Line, from the center line of Gate Road (now Durfee Avenue), 40 feet wide, as described in deed to the County of Los Angeles, recorded in Book 1207, page 74, of Deeds, in the office of said Recorder;

84. Thence easterly in a direct line to the point of intersection of said center line of Gate Road (now Durfee Avenue), with a line bearing South $86^{\circ} 40' 44''$ West from a point in the northwesterly line of Lot 12, Tract No. 688, as shown on map recorded in Book 15, page 171, of Maps; in the office of said Recorder, said last mentioned point being distant North $24^{\circ} 55' 13''$ East 556.72 feet, measured along said northwesterly line of Lot 12, from the southwest corner of said Lot 12;

85. Thence North $86^{\circ} 40' 44''$ East 2759.06 feet, more or less, to the northwesterly prolongation of the northeasterly line of Parcel 1 of land described in deed to Walter G. Kruse, et ux., recorded in Book 25982, page 70, of Official Records, in the office of said Recorder;

86. Thence easterly in a direct line to an angle point in the southerly line of Lot 11, of aforementioned Tract No. 688, from which angle point the most westerly corner of said Lot 11 is shown on said map of Tract No. 688 to be distant 453.30 feet S. $68^{\circ} 51' 1/2''$ W., measured along said southerly line of Lot 11;

87. Thence southerly in a direct line to an angle point in the northwesterly line of Lot 1, Cohn's Partition of Lots 26, 27, 29 and 32 as shown on map recorded in Book 60, pages 3 and 4, of Miscellaneous Records, in the office of said Recorder, said last mentioned angle point being shown on said map of Cohn's Partition of Lots 26, 27, 29 and 32 to be located as follows:

Beginning at the most westerly corner of said Lot 1; thence, N. $49^{\circ} 52'$ E. 9.00 chains; thence N. $23^{\circ} 13'$ E. 5.09 chains to said last mentioned angle point;

88. Thence southwesterly along said northwesterly line of Lot 1 to said most westerly corner of Lot 1, said most westerly corner also being the most northerly corner of Lot 2 of said Cohn's Partition of Lots 26, 27, 29 and 32;

89. Thence southwesterly along the northwesterly line of said Lot 2 and continuing along the line of said Lot 2, following all its various courses, to the most westerly corner of Lot 7, of said Cohn's Partition of Lots 26, 27, 29 and 32;

90. Thence southerly along the westerly line of said Lot 7 and continuing along the southerly prolongation of said westerly line of Lot 7 to the easterly prolongation of the center line of Guirado Street, 40 feet wide, (now Pioneer Boulevard) as shown on map of Tract No. 3584, recorded in Book 38, page 70, of Maps, in the office of said Recorder;

91. Thence along said easterly prolongation of the center line of Guirado Street, 40 feet wide, (now Pioneer Boulevard), to the center line of Workman Mill Road as described in deed to the County of Los Angeles recorded in Book 12367, page 75, of Official Records, in the office of said Recorder;

92. Thence southerly along said center line of Workman Mill Road, following all its various courses and curves, to the northerly terminus of that certain course having a bearing of N. $6^{\circ} 10' 15''$ E. in the center line of Workman Mill Road, as shown on map of Tract No. 6041 recorded in Book 180, pages 12 to 14, inclusive, of Maps, in the office of said Recorder;

93. Thence southerly along the center line of Workman Mill Road as shown on said map of Tract No. 6041 and as shown on map of Tract No. 14971, recorded in Book 341, pages 5 to 10 inclusive, of Maps, in the office of said Recorder, to the westerly prolongation of the northerly line of Lot 3, shown on said map of Tract No. 14971 as having a bearing and length of S. $83^{\circ} 49' 45''$ E., 221.86 feet, said northerly line of Lot 3 also being in the northerly boundary line of said Tract 14971;

94. Thence easterly along said westerly prolongation, said northerly line of Lot 3 and said northerly boundary line of Tract No. 14971 and continuing along the boundary line of said Tract No. 14971, following all its various courses, to the westerly line of Lot 24, of Cohn's Partition of Lot 31, as shown on map recorded in Book 60, page 6, of Miscellaneous Records, in the office of said Recorder;

95. Thence northerly along said westerly line of Lot 24 to the westerly prolongation of the north line of Section 16, Township 2 South, Range 11 West, S.B.B. U M.;

96. Thence easterly along said westerly prolongation and along the north line of said Section 16, to the northeast corner of said Section 16;

97. Thence southerly in a direct line to the northeasterly corner of the City of Whittier, said northeasterly corner being also the northeasterly corner of that certain annexation to said City of Whittier designated Annexation of 1907;

98. Thence southerly along the boundary line of said City of Whittier to its intersection with the north line, or its westerly prolongation, of Section 22, said last mentioned Township and Range;

99. Thence easterly along said north line of Section 22; or along said westerly prolongation and said north line of Section 22, to the northeast corner of said Section 22;

100. Thence southerly along the east line of said Section 22 to the west quarter corner of Section 23, said last mentioned Township and Range;

101. Thence easterly along the east and west quarter section lines of said Section 23 to the east quarter corner of said Section 23;

102. Thence southerly along the east line of said Section 23 to the northwest corner of Section 25, said last mentioned Township and Range;

103. Thence easterly along the north line of said Section 25 to the westerly line of Tract No. 2390 as shown on map recorded in Book 23, page 29, of Maps, in the office of said Recorder;

104. Thence northerly along said westerly line of Tract No. 2390, to the northwesterly corner of said Tract;

105. Thence easterly along the northerly line of said Tract No. 2390 to the northeasterly corner of said Tract;

106. Thence southerly along the easterly line of said Tract No. 2390 to the southeasterly corner of said Tract, said corner also being in northerly line of Lot 3 of the New England Oil Company Tract, as shown on map recorded in Book 17, page 131, of Maps, in the office of said Recorder;

107. Thence easterly and southerly along the northerly and easterly lines of said Lot 3 to the southeasterly corner of said Lot 3, said corner also being in the southerly line of said New England Oil Company Tract;

108. Thence easterly and northerly along the southerly and easterly lines of said New England Oil Company Tract to the northeasterly corner of Lot 13 of said last mentioned Tract, said northeasterly corner also being in the southerly line of Lot 5, Tract No. 4380, as shown on map recorded in Book 48, pages 46 and 47, of Maps, in the office of said Recorder;

109. Thence easterly along said southerly line of Lot 5 to the southeasterly corner of said Lot 5;

110. Thence easterly in a direct line to the southwesterly corner of Lot 2, Tract No. 3422, as shown on map recorded in Book 37, page 51, of Maps, in the office of said Recorder;

111. Thence easterly along the southerly line of said Lot 2, to the easterly line of Rancho La Habra, as shown on map recorded in Book 1, pages 275 and 276, of Patents, in the office of said Recorder;

112. Thence southerly along said easterly line of Rancho La Habra to its intersection with the southerly boundary line of the County of Los Angeles;

113. Thence westerly along said southerly boundary line of the County of Los Angeles and continuing along the boundary line of said County of Los Angeles, following all its various courses and curves to the point of beginning.

The boundary line of the County of Los Angeles and the boundary line of the City of Los Angeles referred to herein, except where otherwise expressly designated, are such boundary lines as the same existed at 12:00 noon on October 31, 1958.

APPENDIX 2

CURRENT VERSION OF WATER RIGHT HOLDERS

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Central Basin Water rights Holders

Party ID	Party	Allowed Pumping Allocation (APA)
0020	A B C Unified School District	298.00
0107	American Textile Maintenance Company	65.00
0125	Angeles Abbey Memorial Park, Inc	4.00
0127	Aqua Capital Management LP	3,760.00
0120	Arco Metals Co, American Brass	0.00
0150	Artesia Cemetery District	12.00
0160	Artesia, City of	24.00
0210	Atkinson Brick Company	9.00
0220	Atlantic Richfield Company	0.00
0229	Automobile Club of Southern California	6.00
0265	Baker Commodities, Inc	60.00
0387	Bell Gardens, City of	1,914.00
0420	Bellflower Home Garden Water Company	306.00
0430	Bellflower Unified School District	89.00
0410	Bellflower, City of	1,380.00
0445	Bellflower-Somerset Mutual Water Company	4,312.88
0642	Boy Scouts of America, Long Beach Area	1.00
0657	Buell, Mary Dolores	1.00
0679	California-American Water Company	2,067.00
0681	California Domestic Water Company	87.00
0686	California, State of	50.00
0740	California Water Service Company	11,774.00
0742	California Water Service Company (Dominguez)	6,480.00
0795	Central Basin Municipal Water District	50.65
0826	Cerritos, City of	4,680.03
0830	Cerritos Community College District	147.00
0855	Chang, I-Hsin and Associates	1.00
0885	Chevron U S A, Inc	94.00
0970	Coast Packing Company	530.00
1017	Commerce, City of	5,081.00
1020	Compton, City of	5,780.00
1030	Compton Unified School District	38.00
1115	Corning Trust	3.75
1165	Crandell, F.J.	1.00
1236	Darling-Delaware Company, Inc	117.00
1385	Dolan, J.E., P.A., & T.P.	2.00

Central Basin Water rights Holders

Party ID	Party	Allowed Pumping Allocation (APA)
1450	Downey, City of	16,553.62
1550	El Rancho Unified School District	55.00
1560	Emoto, John H	2.00
1572	Equilon Enterprises, LLC	6.00
1597	Exide Technologies	62.00
1606	Farmers & Merchants Trust Co of Long Beach	14.00
1700	Flesch, Elizabeth, et al	14.00
1719	Footbridge 1 Trust	3.75
1720	Ford Motor Company	4.50
1726	Frampton, Harvey	10.00
1735	Frampton, William H	25.00
1843	Golden State Water Company	16,439.20
1960	Gordon, Robert E	4.00
1988	Graham, Hugh W or Marcia K, Trustees	6.00
2155	Harada Brothers	6.00
2209	Hathaway, Jesse R	4.07
2211	Hathaway, Merrie F	1.86
2212	Hathaway, Richard F, Jr.	4.07
2213	Hathaway, William A	4.07
2214	Hathaway, Lolene	4.08
2378	Huntington Park, City of	3,853.00
2440	Inglewood Park Cemetery	317.00
2493	Jones Company, The	0.00
2710	Kotake, Masao	27.97
2749	La Habra Heights County Water District	2,596.00
2770	Lakewood, City of	9,432.00
2884	Lincoln Memorial Park, Inc	34.00
2890	Little Lake Cemetery District	14.00
2910	Long Beach, City of	32,692.00
2920	Los Angeles, City of	15,000.00
2930	Los Angeles County Rancho Los Amigos	490.00
3010	Lunday-Thagard Oil Company	212.00
3040	Lussman, Paul H, Jr., et al	7.00
3060	Lynwood, City of	5,337.00
3080	Lynwood Park Mutual Water Company	222.00
3140	Martin, Mary	28.00

Central Basin Water rights Holders

Party ID	Party	Allowed Pumping Allocation (APA)
3170	Maywood Mutual Water Company No 1	741.00
3180	Maywood Mutual Water Company No 2	912.00
3190	Maywood Mutual Water Company No 3	1,407.00
3210	Mellano, G, et al	13.00
3301	Mitsuuchi, Mary F Trust	11.00
3351	Montebello, City of	386.50
3360	Montebello Land and Water Company	1,694.00
3501	Nancy Dee Keane Living Trust	4.00
3514	New England Mutual Life Insurance Company	2.00
3517	Newark Group, Inc., The	257.00
3545	Northrop Grumman Systems Corporation	4.50
3550	Norwalk, City of	2,273.00
3560	Norwalk-La Mirada Unified School District	378.00
3578	O N K Farms	8.00
3605	Oltmans Construction Company	3.00
3640	Orchard Dale Water District	1,254.00
3705	PABCO Building Products, LLC	500.00
3745	Paradise Memorial Park	16.00
3755	Paramount, City of	5,883.00
3760	Paramount Unified School District	46.00
3780	Park Water Company	2.30
3787	Patrician Associates Inc/Majestic Realty Company	12.00
3828	Petersburg, L.P.	300.00
3847	Pico Boys Baseball, Inc	13.00
3853	Pico Rivera, City of	5,579.00
3850	Pico Water District	3,624.00
3958	Puente Basin Water Agency	365.00
3994	Randall, Villis Family Trust	4.00
4108	Rippy, Francine	4.07
4115	Rockview Dairies, Inc	101.00
4116	Rocky Mountain Industries, Inc	0.00
4150	Roman Catholic Archbishop of Los Angeles	347.00
4160	Rosales, Elvira C	3.00
4165	Rosing, L S Trust and P Schwartz	6.00
4175	Rowland Water District	1.00
4300	St John Bosco School	42.00

Central Basin Water rights Holders

Party ID	Party	Allowed Pumping Allocation (APA)
4330	San Gabriel Valley Water Company	2,565.35
4335	Santa Fe Springs, City of	4,035.78
4345	Sativa - Los Angeles County Water District	474.00
4349	Scantlebury, Robert P	4.00
4378	September Properties, LLC	22.00
4450	Signal Hill, City of	2,022.00
4473	Simmons Survivor's Trust	33.00
4590	South Gate, City of	11,183.00
4540	South Montebello Irrigation District	1,268.00
4549	Southern California Edison Company	670.00
4685	Statewide Stations, Inc	1.00
4810	Suburban Water Systems	3,721.00
4915	Taurek, Mary	1.00
4934	Tesoro Logistics Operations	54.00
4980	Tract Number One Hundred and Eighty Water Co	2,137.00
4990	Tract 349 Mutual Water Company	423.00
5019	Tucker, W and/or Bobby Robertson	8.00
5358	Vangrootheest, Ernest A	10.00
5460	Vernon, City of	7,539.00
5490	Virginia Country Club	274.00
5610	Walnut Park Mutual Water Company	996.00
5528	WEMS, Inc.	8.00
5660	Whittier, City of	895.00
5670	Whittier Union High School District	100.00
5750	Wolfsberger, Helen and Christine Joseph	2.00
5800	Yamamoto, George and Alice	14.00
5903	Zane Living Trust	0.00
Central Basin Total		217,367.00

Appendix 3

CENTRAL BASIN SMALL WATER PRODUCERS GROUP

As used in the Central Basin Judgment, the “Small Water Producers Group” shall refer to a voluntary group consisting of parties to the Central Basin Judgment with an Annual Pumping Allocation no greater than 5,000 acre-feet, acting jointly to represent its members with regards to interests specific to them and their constituents and/or customers concerning the management of the Central Basin and the administration and enforcement of this Judgment. Membership in the Small Water Producers Group may be modified from time to time by affirmative vote of the then-current composition of said Group, provided that each member thereof shall hold no greater than 5,000 acre-feet of Allowed Pumping Allocation.

Any benefit or right attributed to the Group by the Judgment, including the reserved seat on the Water Rights Panel, shall be valid and enforceable, so long as the Group’s membership consists of a minimum of 5 parties to the Central Basin Judgment who are Water Purveyors., .

As of the time of entry of this Third Amended Judgment, the Small Water Producers Group consists of:

Bellflower-Somerset Mutual Water Company

La Habra Heights County Water District

Montebello Land and Water Company

City of Norwalk

Orchard Dale Water District

Pico Water District

Sativa -- Los Angeles County Water District

South Montebello Irrigation District

Appendix 4

PERMITTED EXISTING EXPORTS

The Agreement among Rowland Water District, on the one hand, and La Habra Heights County Water District and Orchard Dale Water District, on the other hand, allowing for maximum production of 2,500 acre-feet per year.

The Agreement between Puente Basin Water Agency and California Domestic Water Company, allowing for maximum production of 2,500 acre-feet per year.

1 PROOF OF SERVICE

2
3 STATE OF CALIFORNIA, COUNTY OF LOS ANGELES

4 I am employed in the county of LOS ANGELES, State of California. I am over the age of 18 and not a party to the within
action; my business address is: 301 North Lake Avenue, 10th Floor, Pasadena, California 91101

5 On DECEMBER 27, 2013, I served the foregoing document described as **THIRD AMENDED JUDGMENT** on
6 **INTERESTED PARTIES** in this action

- 7 ☒ by placing the true copies thereof enclosed in sealed envelopes addressed as stated on the attached mailing list:
8 ☐ by placing ☐ the original ☐ a true copy thereof enclosed in sealed envelopes addressed as follows:

9 SEE ATTACHED MAILING LIST

10
11
12 ☒ BY MAIL

13 ☐ I deposited such envelope in the mail at PASADENA, California.
14 The envelope was mailed with postage thereon fully prepaid.

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16 I am "readily familiar" with firm's practice of collection and processing correspondence for mailing. It is deposited with U.S.
17 postal service on that same day in the ordinary course of business. I am aware that on motion of party served, service is
presumed invalid if postal cancellation date or postage meter date is more than 1 day after date of deposit for mailing in
affidavit.

18 Executed on DECEMBER 27, 2013, at PASADENA, California.

19 ☐ ** (BY PERSONAL SERVICE) I delivered such envelope by hand to the offices of the addressee.
20 Executed on _____ at _____, California.

21 ☒ (State) I declare under penalty of perjury under the laws of the State of California that the above is true and correct.

22
23 ☐ (Federal) I declare that I am employed in the office of a member of the bar of this court at whose direction the service was
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25 PAMELA J. CHILDRESS
26 (NAME)

27
28
PROOF OF SERVICE

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Appendix I

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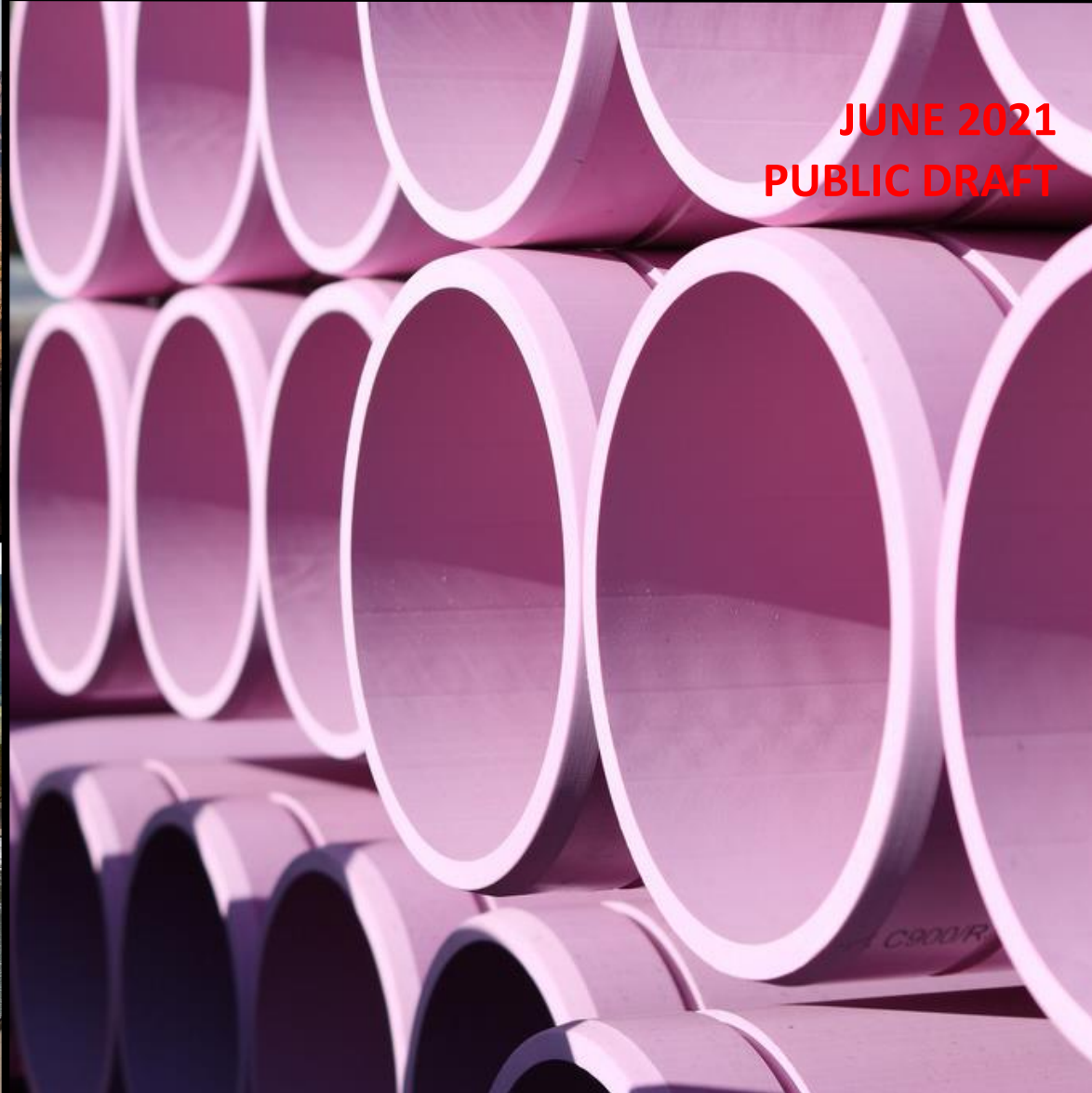


2020

URBAN WATER MANAGEMENT PLAN

CENTRAL BASIN MUNICIPAL WATER DISTRICT

**JUNE 2021
PUBLIC DRAFT**





2020

URBAN WATER MANAGEMENT PLAN



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JUNE 2021 PUBLIC DRAFT

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Appendix G	City of South Gate 2017 Hazard Mitigation Plan
Appendix H	City of Whittier 2015 Natural Hazards Mitigation Plan

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ACRONYMS

1,2,3-TCP	1, 2, 3 – Trichloropropane
ABP	Alamitos Barrier Project
Act	Urban Water Management Planning Act
AF	acre-feet
AFY	acre-feet per year
BDCP	Bay Delta Conservation Plan
BMP	Best Management Practice
CalWEP	California Water Efficiency Partnership
CBMWD or District	Central Basin Municipal Water District
Central Basin	Central Groundwater Basin
COG	Local Council of Governments
CRA	Colorado River Aqueduct
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CWC	California Water Code
DBPs	Disinfection Byproducts
DCP	Delta Conveyance Project
DCR	SWP Delivery Capability Report
DDW	State Water Resources Control Board Division of Drinking Water
DLR	Detection Limit for Purposes of Reporting
DMM	Demand Management Measure
DRA	Drought Risk Assessment
DWR	California Department of Water Resources
EOC	Emergency Operation Center
EPA	U.S. Environmental Protection Agency
ETo	Evapotranspiration
FY	Fiscal Year
Gateway IRWM	Gateway Integrated Regional Water Management
GPCD	gallons per capita per day
GRIP	Groundwater Reliability Improvement Program
GW	Groundwater
GWMA	Gateway Water Management Authority
HECW	High Efficiency Clothes Washer
HET	High Efficiency Toilet
HR	Hydrologic Region
IRP	Integrated Resource Plan
JWPCP	Joint Water Pollution Control Plant
kWh	Kilowatt-hours
kWh/AF	Kilowatt-hours per Acre-Feet
kWh/MG	Kilowatt-hours per Million Gallons

LACDPW	Los Angeles County Department of Public Works
LACSD	Los Angeles County Sanitation District
LF	Linear Feet
LHMP	Local Hazard Mitigation Plan
MAF	million acre-feet
Main Basin	Main San Gabriel Basin
MCL	Maximum Contaminant Level
MFSG	Montebello Forebay Spreading Grounds
mg/L	Milligrams per Liter
MGD	million gallons per day
MOU	Memorandum of Understanding
MWD	Metropolitan Water District of Southern California
NDMA	N-nitrosodimethylamine
OEHA	Office of Environmental Health Hazard Assessment
PFAS	Per- and Polyfluoroalkyl Substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic acid
PHETs	Premium HETs
PPCPs	Pharmaceuticals and Personal Care Products
ppt	Parts per Trillion
RHNA	Regional Housing Needs Assessment
River Watermaster	San Gabriel River Watermaster
SBx7-7	Senate Bill x7-7
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SGVMWD	San Gabriel Valley Municipal Water District
SWP	State Water Project
TDS	Total Dissolved Solid
TOC	Total Organic Carbon
ULFT	Ultra-Low-Flow Toilet
UWMP	Urban Water Management Plan
WQPP	Water Quality Protection Project
WRD	Water Replenishment District of Southern California
WRP	Water Reclamation Plant
WSAP	Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan
WSDM	Water Surplus and Drought Management Plan
µg/L	Micrograms per Liter

EXECUTIVE SUMMARY & LAY DESCRIPTION

INTRODUCTION

Central Basin Municipal Water District's (CBMWD) 2020 Urban Water Management Plan (UWMP) has been prepared in accordance with the 1983 Urban Water Management Plan Act (Act) and its amendments. The Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) of water annually to prepare and adopt an UWMP every five years.

This 2020 UWMP is an update of CBMWD's 2015 UWMP. The intent of this plan is to provide the California Department of Water Resources (DWR) with information on the present and future water resources, demands, and provide an assessment of CBMWD's water resource needs. Specifically, this 2020 UWMP provides water supply planning for the 25-year period from 2020 to 2045 in 5-year increments; identifies and quantifies adequate water supplies for existing and future demands during normal, dry, and multiple-dry years; evaluates demand management measures; addresses water supply contingency planning; and describes strategies to expand supply sources such as groundwater recovery and recycled water.

Section 1.4.3 offers of summary of each section of this 2020 UWMP.

SERVICE AREA

CBMWD is a wholesaler with service area covers about 227 square miles and includes 24 cities and several unincorporated areas in southeast Los Angeles County. CBMWD maintains a population of approximately 1.6 million people according to the Southern California Area Governments (SCAG), however, due to the undercounting of the area's immigrant population, the population is considered to be closer to 2 million.

WATER SOURCES AND SUPPLIES

CBMWD delivers imported water from Metropolitan Water District of Southern California (MWD). CBMWD also delivers recycled water from various Los Angeles County Sanitation District (LACSD) wastewater treatment plants to its members.

DEMAND PROJECTIONS

The 25-year demand projections provided in this UWMP reflect CBMWD's projected demand for imported supply from MWD since CBMWD is 100 percent reliant on MWD. CBMWD's demand projections are based on population growth, climate change impacts and retail agencies reduction requirements under Senate Bill (SBx7-7).

20X2020 WATER USE REDUCTION TARGETS

SBx7-7, passed in November 2009, requires California urban water suppliers to achieve a 20 percent reduction in per capita water consumption by 2020. Under this legislation, retail water suppliers must comply with target-setting and reporting requirements. Wholesale water suppliers are not subjected to the requirements of SBx7-7; however, wholesalers are required to include in their 2020 UWMP an assessment of present and proposed future measures, programs, and policies that would help the retail water suppliers in their wholesale service area to achieve their water use targets.

FUTURE WATER SUPPLY PROJECTS

It has been part of CBMWD's Capital Improvement Projects Plan and Five (5) Year Recycled Water Facilities Plan (Recycled Water Master Plan) to expand the existing recycled water distribution system. Past drought conditions, new regulations, and available funding through Proposition 1 have accelerated CBMWD's expansion efforts. Projects included in the Preliminary Capital Improvement Projects Plan are described in **Section 7**.

WATER SERVICE RELIABILITY

It is required that every urban water supplier assess the reliability to provide water service to its customers under normal, dry, and multiple dry water years.

CBMWD receives imported water from MWD through their member agencies. The completion of MWD's 2020 Integrated Water Resources Plan will be completed after the submission of CBMWD's 2020 UWMP. Information on MWD's 2015 Integrated Water Resources Plan is still relevant to this day. The plan describes the core water resource strategy, which will be used to meet full-service demands at the retail level under all foreseeable hydrologic conditions from 2025 through 2045. Furthermore, MWD's 2020 UWMP finds that MWD is able to meet full service demands of its member agencies with existing supplies from 2025 through 2045 during normal years, single dry year, and multiple dry years.

CBMWD is therefore capable of meeting the water demands of its customers in normal, single

dry, and multiple dry years between 2025 and 2045, as shown in Section 3.6. CBMWD has also conducted a Drought Risk Assessment as part of a new requirement for the 2020 UWMP which mandates water purveyors to assess their water demand and supplies within the next five years under drought situations. Based on the assessment, CBMWD via MWD is able to meet its retailers demands under drought situations from 2021 – 2025 without the need of the Water Shortage Contingency Plan's (WSCP) water supply augmentation or demand reductions as shown in **Section 5**; however, CBMWD continues to promote water saving measures to its consumers to ensure reliability of its supplies.

CHALLENGES AHEAD & STRATEGIES FOR MANAGING RELIABILITY RISKS

CBMWD and its member agencies faces challenges in the near future regarding water supply include:

- Over the last decade, drastic changes in annual hydrologic conditions have negatively affected water supplies available from the State Water Project (SWP) and the Colorado River Aqueduct (CRA).
- The declining ecosystem of the Bay-Delta has resulted in a reduction in water supply deliveries to State Water Contractors, including MWD.

CBMWD's strategies for managing these reliability risks include:

- Continuing a progressive and effective water conservation program.
- Replacing deteriorating water infrastructure through a proactive capital improvement program, which will reduce water main leaks and conserve water and enhance efficient delivery of water supplies to its members.
- Implementing shortage response actions, as needed, under the WSCP and Water Supply Allocation Plan (WSAP).



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Formed in 1952, Central Basin Municipal Water District (CBMWD) is a wholesale agency that provides imported water from Metropolitan Water District (MWD) and recycled water to 40 retail members with a total population of over 1.5 million people.



SECTION 1: INTRODUCTION

CENTRAL BASIN MUNICIPAL WATER DISTRICT | 2020 URBAN WATER MANAGEMENT PLAN

SECTION 1

INTRODUCTION

1.1 UWMP PURPOSE & SUMMARY

This is the 2020 Urban Water Management Plan (UWMP) for Central Basin Municipal Water District (CBMWD or District). This plan has been prepared in compliance with the Urban Water Management Planning Act (Act), codified at California Water Code (CWC) sections 10610 through 10657.

As part of the Act, the legislature declared that waters of the state are a limited and renewable resource subject to ever increasing demands; that the conservation and efficient use of urban water supplies are of statewide concern; that successful implementation of plans is best accomplished at the local level; that conservation and efficient use of water shall be actively pursued to protect both the people of the state and their water resources; that conservation and efficient use of urban water supplies shall be a guiding criterion in public decisions; and that urban water suppliers shall be required to develop water management plans to achieve conservation and efficient use.

The UWMP Act requires “every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) of water annually, to prepare and adopt, in accordance with prescribed requirements, an urban water management plan.”



Figure 1.1: UWMPs Comply with State Water Code

These plans must be filed with the California Department of Water Resources (DWR) every five years and evaluate reasonable and practical efficient water uses, reclamation, and conservation activities (see generally Water Code § 10631).

1.2 PAST UPDATES TO THE UWMP ACT

The Act has been amended on multiple occasions since its initial passage in 1983. Of all the amendments, the most significant came in 2009 as a result of the requirements of Senate Bill 7 / Seventh Extraordinary Session (SBx7-7). The requirements of this bill state that per capita water use within an urban water supplier's service area must decrease by 20 percent by the year 2020 (20x2020) in order to receive grants or loans administered by DWR or other state agencies. The legislation sets an overall goal of reducing per capita urban water use by 20 percent by December 31, 2020. The state was required to make incremental progress towards this goal by reducing per capita water use by at least 10 percent by December 31, 2015. In addition, each urban retail water supplier was required to develop water use targets by July 1, 2016. Effective 2021, urban retail water suppliers who do not meet the 2020 water conservation requirements established by this bill are not eligible for state water grants or loans. SBx7-7 substantially expanded the role of UWMPs by requiring all urban retail water suppliers to develop baseline daily per capita water use data, urban water use targets, among other technical information, and to report all of the information in their 2010 UWMPs.

1.3 UPDATES TO THE UWMP ACT FOR 2020 UWMPs

There are no significant changes affecting the 2020 UWMPs on the level of SBx7-7; however, there are numerous minor to major updates to the UWMP Act affecting the 2020 UWMPs as follows:

- **Water Loss:** Quantify distribution system water loss for each of the five years preceding the plan update (CWC § 10631 (d) (3) (A), SB 1414, 2019)
- **Drought Risk Assessment:** Assess water supply reliability over a 5-year period examining water supplies, water uses, and the reasonable predicted water supply reliability for five consecutive dry years (CWC § 10635 (b), SB 606, 2018)
- **Reporting of Energy Intensity:** Provide information that the water supplier can readily obtain on the energy used to process water (CWC § 10631.2 (a), SB 606, 2018)
- **Lay Description:** Include a lay description of the fundamental determinations of the UWMP, especially regarding water service reliability, challenges ahead, and strategies for managing reliability risks (CWC § 10630.5, SB 606, 2018)
- **Climate Change Impacts and Considerations:** Provide details on the impacts of climate change and consider them into projections (CWC § 10630, SB 606, 2018)

- **Water Shortage Contingency Plan (WSCP):** The water shortage contingency analysis required in previous UWMPs by former law has been replaced by a WSCP mandate with new elements, which include new six standard water shortage levels (CWC § 10632, SB 606, 2018, AB 1414, 2019)
- **Seismic Risk Assessment and Mitigation Plan:** As part of the WSCP, water suppliers are required to assess seismic risks to their water system facilities and measures to mitigate those risks (CWC § 10632.5, SB 664, 2015)

Of the above, the inclusion of the WSCP (including the seismic risk assessment and mitigation plan as part of the WSCP) as a separate document with revised elements is the most significant update affecting the 2020 UWMPs. AB 1414, SB 606, and SB 664, which amended the WSCP, mark a continued focus on water shortage preparedness and pre-planned strategies for mitigating catastrophic service disruptions.

1.4 2020 UWMP SCOPE & FORMAT

1.4.1 SCOPE/TOPICS OF DISCUSSION

The UWMP provides DWR with information on present and future water resources and demands as well as an in-depth assessment of the water resource needs of CBMWD. Specifically, this UWMP provides water supply analysis for a 25-year planning period in 5-year increments and effectively revises CBMWD's 2015 UWMP.

Water supply assessments for existing and future demands have been evaluated under three hydrologic conditions (normal year, single-dry year, and multiple-dry years). Preparation of this document was in accordance with requirements of the Act and includes the following topics:

- *Water Service Area and Facilities*
- *Water Sources and Supplies*
- *Water Use by Customer Type*
- *Energy Intensity*
- *Climate Change Impacts*
- *Demand Management Measures*
- *Water Supply Reliability*
- *Planned Water Supply Projects and Programs*
- *Water Shortage Contingency Plan*
- *Recycled Water*

With the passage of SBx7-7 in 2009, Demand Management Measures (DMMs) became a critical component of an agency's UWMP.

The topics listed on the previous page are consistent with the 2015 UWMP with the additions of Climate Change Impacts and Energy Intensity. Furthermore, updates also include narratives related to the above topics reflecting current (2020) conditions. In addition, the incorporation of visual format changes, expansions of existing text, and addition of new sub-categories and/or new data enhance this 2020 UWMP and provide more benefit for CBMWD.

1.4.2 SBX7-7 CONSERVATION UPDATES

As with the 2015 UWMP, each urban retail water supplier must include in its 2020 UWMP the following information from its target-setting process:

- *Baseline daily per capita water use*
- *2020 urban water use target*
- *2015 interim water use target*
- *Compliance method being used along with calculation method and support data*
- *Updates on interim (2015) target*

Since the above information is already contained in the 2015 UWMP, an agency has the option of re-stating this information if it is the same from the 2015 UWMP or revising it if different from the 2020 UWMP.



Figure 1.2: SBx7-7 Aims to Protect Water Sources, Including the Bay-Delta

Wholesale water suppliers, including CBMWD, are required to include an assessment of present and proposed future measures, programs, and policies that would help achieve the 20x2020 goal. CBMWD works with its retail agencies to promote water use efficiency within its service area, and administers various conservation programs, including

Metropolitan Water District of Southern California (MWD) rebate programs for its retail agencies. Before conservation program budgets are approved by the CBMWD's Board of Directors, they are vetted with the retail agencies. A fuller scope of CBMWD's SBx7-7 present and proposed future measures, programs, and policies are provided in **Section 2** of this UWMP.

1.4.3 FORMAT OF THE REPORT

The sections and information contained in this 2020 UWMP correspond to the items in the Act and other amendments to the Water Code, as follows:

Section 1 - Introduction	This section describes the UWMP Act, CBMWD's planning and coordination process, the history of CBMWD's water supply system, and a description of its service area.
Section 2 – Water Demands	This section describes past, current, and projected future water demands within CBMWD's service area, as well as factors that affect demand, including climate and population demographics. This chapter also discusses the requirements of the Water Conservation Act of 2009 (SBx7-7). This section also looks at climate change impacts to water demands and projections.
Section 3 – Water Sources & Supplies	This section describes CBMWD's water supplies, including imported water from MWD, and how CBMWD handles those supplies. This section also discusses the quality of CBMWD's water sources, including a discussion on the treatment and testing of water.
Section 4 – Demand Management Measures	This section addresses CBMWD's compliance with the current Best Management Practices (BMPs), otherwise known as Demand Management Measures (DMMs).
Section 5 – Water Shortage Contingency Plan	This section describes CBMWD's contingency planning in the event of a water supply interruption, such as a drought or catastrophe. This section also discusses CBMWD's Board adopted Conservation Plan (first adopted in 2009) and MWD's Water Surplus and Drought Management Plan (WSDM).
Section 6 – Recycled Water	This chapter describes past, current, and projected recycled water use, along with a description of wastewater collection and treatment facilities.
Section 7 – Future Water Supply Projects & Programs	This section discusses planned and potential future water supplies and programs, including new supply sources, transfers and exchanges, and the feasibility of such supplies and programs.
Section 8 – Plan Adoption Process	This Section describes CBMWD's planning and coordination process for the 2020 UWMP, including public and outside agency participation, and Board adoption.
Appendices	The appendices contain references, supplemental information, and specific documents relating to CBMWD, used to prepare this 2020 UWMP.

1.5 AGENCY OVERVIEW

Central Basin Municipal Water District was established by a vote of the people in 1952 to provide access to imported water as an alternative to groundwater. CBMWD joined MWD in 1954 to purchase, on a wholesale level, imported potable water for resale to the local municipalities, investor-owned and mutual water companies and water districts. As a water supplier, MWD provides the Southern California region with a reliable supply of imported water. CBMWD remains one of the larger member agencies of MWD's wholesalers providing imported water to 40 retail water providers and one water wholesaler.

CBMWD wholesales potable water to cities, mutual water companies, investor-owned utilities, water districts and private water companies in the region. In addition, CBMWD supplies recycled water to the region for municipal, commercial and industrial use. CBMWD supplies imported and recycled water to its customer agencies to help protect the Central Groundwater Basin and develop a more diversified portfolio of water supplies. Today, the District serves 1.6 million people from 24 cities and unincorporated areas in southeast Los Angeles.

CBMWD's mission statement is: *"The mission of the Central Basin Municipal Water District is to deliver reliable and high-quality water, as well as recycled water services to its customers and communities through effective and collegial partnerships with its retailers and other wholesalers."*

CBMWD policies are set by an eight-person board of directors with 5 members elected by residents in the five divisions that comprise the District's service area. In addition to the five publicly-elected directors, three additional directors are appointed by the water purveyors within the District pursuant to Section 71267 of the Water Code. Each director serves a four-year term once elected. Central Basin's Board of Directors appoints two representatives to serve on the 38-member MWD Board of Directors. CBMWD's representation on the MWD Board is critical to shaping a regional voice on water issues.

The current members of the Board of Directors are:

- **Arturo Chacon – President, Director Division 3**
President of Chacon Water Advisory
- **Noe Negrete – Vice President, Appointed Director, Large Water Users**
Director of Public Works for the City of Santa Fe Springs
- **Martha Camacho-Rodriguez – Director Division 1**
CBMWD Board Member

- **Robert Apodaca – Director Division 2**
Representative on the Metropolitan Water District Board of Directors
- **Leticia Vasquez – Director Division 4**
CMBWD Board Member
- **Phillip Hawkins – Director Division 5**
Representative on the Metropolitan Water District Board of Directors
- **Monica Heredia – Appointed Director, At-Large - Cities**
Director of Public Works for the City of Pico Rivera
- **Michael Gualtieri – Appointed Director, At-Large**
General Manager for the La Habra Heights County Water District

1.6 SERVICE AREA AND FACILITIES

1.6.1 SERVICE AREA DESCRIPTION

CBMWD's service area covers about 227 square miles and includes 24 cities and several unincorporated areas in southeast Los Angeles County. Central Basin maintains a population of approximately 1.6 million people according to the Southern California Area Governments (SCAG), however, due to the undercounting of the area's immigrant population, the population is considered to be closer to 2 million.

The cities and their associated divisions include:

- **Division 1:**
Bell Gardens, Downey, Montebello, Pico Rivera, West Whittier/Los Nietos, and unincorporated areas of Los Angeles County.
- **Division 2:**
La Habra Heights, La Mirada, Norwalk, Santa Fe Springs, Whittier and South Whittier.
- **Division 3:**
Bell, Commerce, Cudahy, Huntington Park, Maywood, Walnut Park, Monterey Park, Vernon and unincorporated areas of East Los Angeles.
- **Division 4:**
Lynwood, South Gate, Florence-Graham, Willowbrook, and portions of Compton and Carson.
- **Division 5:**
Artesia, Bellflower, Cerritos, Hawaiian Gardens, Lakewood, Paramount, Signal Hill, and unincorporated county area in Long Beach.

The 40 retail member agencies and 1 water wholesaler that receive water from CBMWD serve about over 1.5 million people in the Gateway Cities area (unincorporated areas of LA County included). Service areas for the CBMWD retail agencies are shown below in **Figure 1.3**.

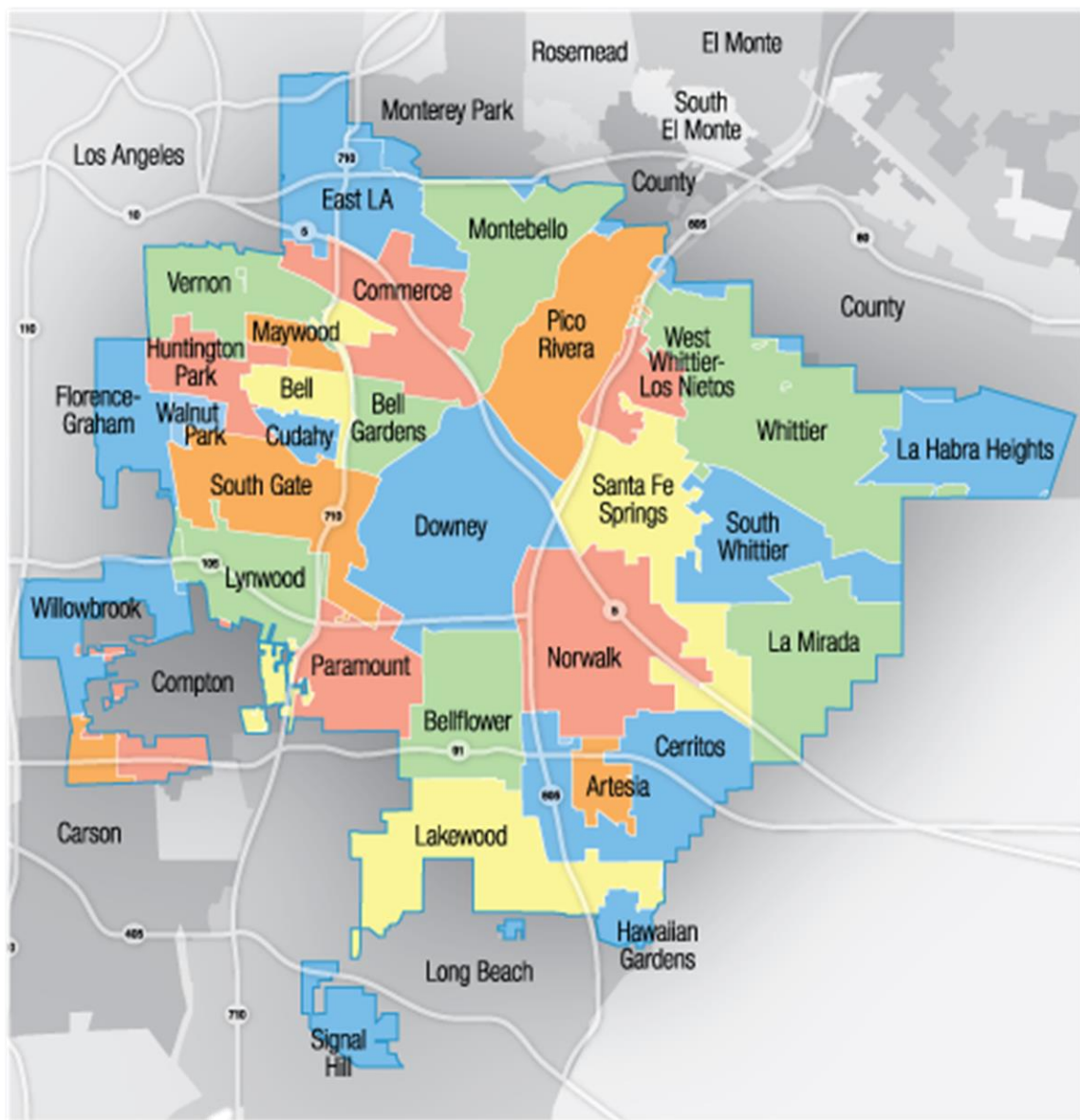


Figure 1.3: CBMWD Retail Agency Boundaries

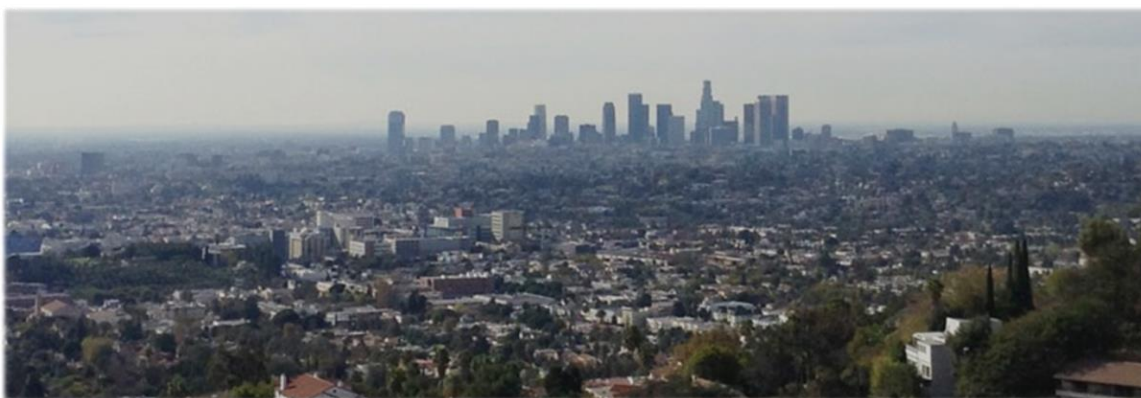


Figure 1.4: A Portion of CBMWD's Service Area

1.6.2 CBMWD'S WATER FACILITIES

CBMWD has no potable water facilities and only owns/operates recycled water facilities. The existing CBMWD recycled water system is divided into three pressure zones. Zone 1 in the north is supplied from the Rio Hondo Pump Station. To the south is Zone 2, which can receive water from Zone 1 through a pressure-reducing valve or from the Cerritos Pump Station through variable frequency drives currently set to maintain system pressures. Zone 3 lies in the western portion of the service area and is supplied through the Hollydale Pump Station from Zone 2. All three pressure zones make a hydraulically closed system with no storage to buffer customer demands. Since water can be fed from Zone 1 into Zone 2, but not completely in the opposite manner, Rio Hondo Pump Station needs to be operational whenever there are demands in Zone 1 downstream of the pump station in the Pico Rivera and Montebello areas.

RIO HONDO PUMPING STATION

The 4-acre Main Pumping Station is located in the City of Pico River; however, the lease is with the City of Whittier. The pump station consists of four pumps, and two of the four pumps are meant to handle higher demands for recycled water from 10PM to 6AM. These two pumps are known to the District as Pump 110 and Pump 120. A smaller, and newer, pump is meant to handle lower demands for recycled water



Figure 1.5: Pump 130 at the Rio Hondo Pumping Station

and to conserve energy during the day and was installed during the most recent upgrades at the pump station. This pump is known to the District as Pump 270. The smallest pump is not meant to cover recycled water demands and is typically used to refill pipelines when they are emptied. This pump is known to the District as Pump 130.

HOLLYDALE PUMPING STATION

CBMWD operates another pumping station in the City of South Gate known as the Hollydale Pumping Station. The 50' x 15' Booster station is located at Hollydale Park in the in the City of South Gate. It consists of three booster pumps and two of them are meant to handle higher demands for recycle water from 10PM to 6AM. These two booster pumps are known to the district as Booster #1 and Booster #2. Booster #3 as it is known to the district provides the extra boost needed to bring the water pressure to the desired level.

STORAGE & DISTRIBUTION

CBMWD's system does not have any reservoir facilities as of 2020 and does not own any potable water distribution mains. In total, the District maintains over 80 miles of recycled water mains ranging in size from 24 inches to 36 inches in diameter.

1.6.3 FACILITY MAINTENANCE & CARE

CAPITAL IMPROVEMENTS

CBMWD is actively pursuing grant funding to develop capital improvements along its Recycled Water Program. The District has been intensely focused on its recycled water system for the past five years. The following three major projects were designed to provide recycled water to CBMWD's users:

- **Gateway Improvement Projects:**

CBMWD has worked directly with the City of South Gate, the City of Bell Gardens, and the City of Lynwood to expand the CBMWD recycled water supply in their areas. The three pipeline expansions will provide recycled water to businesses, parks, and schools located within the three disadvantaged communities. Construction has been delayed due to funding.

- **United Technologies Corporation Aerospace Systems:**

The District completed construction for a recycled water project in the cities of Santa Fe Springs and Norwalk that will initially provide 80 AF of recycled water to United

Technologies Corporation Aerospace Systems (UTC) in Santa Fe Springs. The project commenced with water deliveries in April 2018.

- **Montebello Hills Pipeline and Pump Station Project:**

The project involved construction and operation of approximately 2,600 linear feet (LF) of a 16-inch recycled water pipeline and a pump station. The pipeline and pump station would deliver recycled water to the Montebello Hills Specific Plan Development in the City of Montebello to use for irrigation and construction related uses such as grading and dust control. The maximum amount of recycled water delivered would be up to a maximum of 446 AF per year of recycled water temporarily, and in the future reduce supplies to a maximum of 240 AF per year. Construction has been delayed due to funding.

ROUTINE MAINTENANCE

Inframark has managed and operated CBMWD's reuse water distribution system since September 2017. CBMWD's infrastructure consists of lift stations and a distribution system that delivers between 4,500 to 5,000 AF per year of recycled water to more than 300 metered connections through an 80-mile network of distribution piping throughout its service area.



Figure 1.6: Inspection of the Rio Hondo Pump Station

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As a wholesale agency, FMWD sells water only to its retail member agencies. FMWD supplies its water to its member agencies through large metered connections and does not have any direct retail metered connections.

SECTION 2: WATER DEMANDS

CENTRAL BASIN MUNICIPAL WATER DISTRICT | 2020 URBAN WATER MANAGEMENT PLAN



SECTION 2

WATER DEMAND

2.1 OVERVIEW

In 2010, the Gateway Water Management Authority (GWMA) was formed between CBMWD and 15 cities and agencies within the Gateway region of Los Angeles. This Alliance created flexibility for members in meeting the water use reduction targets required under SBx7-7. Currently, the Alliance is down to 12 cities and agencies and these members have been actively engaged in efforts to reduce water use in their service areas to meet the 2015 interim 10 percent reduction and the 2020 final water use target. Meeting this target is critical to ensure that CBMWD and all Gateway Alliance members are eligible to receive future state water grants and loans.

In April 2015, Governor Brown issued an Emergency Drought Mandate as a result of one of the most severe droughts in California's recorded history, requiring a collective reduction in statewide urban water use of 25 percent by February 2016. In response to the Governor's mandate, CBMWD's retail agencies are carrying out more aggressive conservation efforts and implementing higher stages of their water conservation ordinances to achieve the demand reduction goal set by the mandate.

CBMWD alongside with their customers and alliance members utilizes its Conservation Monitoring Program to meet SBx7-7 water reduction targets.

This section explores in detail CBMWD's current water demands and the factors that influence those demands as well as provide a perspective of its expected future water demands for the next 25 years. In addition, this section provides a discussion of proposed programs that CBMWD intends to implement to support the region's water demand reduction goals.

2.2 FACTORS AFFECTING DEMAND

Water consumption is influenced by many factors, from climate characteristics of

hydrologic region, to demographics, land use characteristics, economics, and legislation. The key factors affecting water demand in CBMWD's service area are discussed in the following sub-sections.

2.2.1 CLIMATE

CBMWD is located within the South Coast Air Basin (SCAB) that encompasses urban and unincorporated areas of Los Angeles County. The SCAB climate is characterized by a "Mediterranean" climate: a semi-arid environment with mild winters, warm summers and moderate rainfall. **Table 2.1** shows the historical average evapotranspiration (ET_o), rainfall, and temperatures for the CBMWD service area from 2001 to 2020.

Table 2.1: Monthly Average Climate Characteristics

Month	Standard Monthly Average ET _o (Inches)	Average Total Rainfall (Inches)	Average Temperatures (°F)	
			Max.	Min.
January	1.92	1.48	69.09	41.89
February	2.31	2.31	67.29	43.13
March	3.65	1.21	69.14	46.89
April	4.53	0.62	71.30	49.69
May	4.99	0.32	72.42	54.46
June	4.90	0.01	74.88	58.84
July	5.70	0.09	80.42	62.36
August	5.53	0.02	82.53	61.99
September	4.50	0.14	83.64	59.71
October	3.29	0.39	78.97	54.18
November	2.10	0.74	73.68	46.89
December	1.65	2.10	67.92	41.73
Annual	45.07	9.41	74.27	51.81

Local rainfall has limited impacts on reducing demand for CBMWD. Water that infiltrates into the soil may enter groundwater supplies depending on the local geography; however, due to significant impervious cover in southern California, rainfall runoff flows to a system of concrete storm drains and channels that lead directly to the ocean. The Los Angeles County Department of Public Works (LACDPW) operates stormwater capture and replenishment activities at the San Gabriel River Spreading Grounds and Rio Hondo Spreading Grounds which contribute to the Central Groundwater Basin. Replenishment of the Central Groundwater Basin occurs through recycled water and untreated imported water managed by the Water Replenishment District of Southern California (WRD).

Metropolitan's water supplies come from the State Water Project (SWP) and the Colorado River Aqueduct (CRA), influenced by climate conditions in northern California and the Colorado River Basin, respectively. Both regions have been suffering from multi-year drought conditions with record low precipitation which directly impact water supplies to southern California.

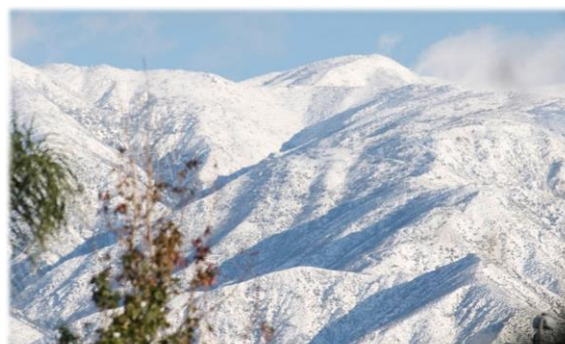


Figure 2.1: Snowfall on San Gabriel Mountains

CLIMATE CHANGE

The rise of anthropogenic activities producing carbon dioxide in the world has changed the earth's climate by emitting greenhouse gasses responsible for global warming. This has resulted in extreme weather events occurring more frequently. The severity and frequency of climate change impacts on temperature and precipitation patterns can be difficult to forecast due to dramatic shifts in weather patterns as a result of increased concentrations of carbon dioxide in the atmosphere. While the precise timing, severity, and regional impacts of these temperature and precipitation changes are uncertain, climate researchers have identified several important issues of concern for water planners in California. The climate change impacts of concern are as follows:

Temperature Increases

- More winter precipitation falling as rain rather than snow, leading to reduced snowpack water storage, reduced long term soil humidity, reduced groundwater and downstream flows, and reduced imported water deliveries
- Higher irrigation demands as temperatures alter evapotranspiration rates, and growing seasons become longer
- Exacerbated water quality issues associated with dissolved oxygen levels, increased algal blooms, and increased concentrations of salinity and other constituents
- Impacted habitats for temperature-sensitive fish and other life forms, and increased susceptibility of aquatic habitats to eutrophication

Precipitation Pattern Changes

- Increased flooding (both coastal and inland) caused by more intense storms
- Changes to growth and life cycle patterns caused by shifting weather patterns
- Threats to soil permeability, adding to increased flood threat and decreased water availability
- Reduced water supply caused by the inability to capture precipitation from more intense storms, and a projected progressive reduction in average annual runoff (though some models suggest that there may be some offset

- from tropical moisture patterns increasingly moving northward)
- Increased turbidity caused by more extreme storm events, leading to increased water treatment needs and impacts to habitat
- Increased wildfires with less frequent, but more intense rainfall, and possibly differently timed rainfall through the year, potentially resulting in vegetation cover changes
- Reduction in hydropower generation potential

Sea Level Rise

- Inundation and erosion of coastal areas (coastal bluffs in particular), including coastal infrastructure
- Saline intrusion of coastal aquifers
- Increased risk of storm surges and coastal flooding and erosion during and after storms
- Changes in near-shore protective biogeography such as loss of sand, tide pools, wetlands, and kelp beds

Although the extent of these changes is uncertain, CBMWD, along with its member agencies, is already planning ahead to ensure long lasting reliability of its source for its retailers.

2.2.2 DEMOGRAPHICS

Table 2.2 shows the existing and projected service area population total for CBMWD from 2020 to 2045. This population represents customers directly served by CBMWD retailers. The 2020 population was determined based on the population figures from the CA Department of Finance. Projections were determined based on SCAG's 2020 Regional Transportation Plan and Sustainable Communities Strategy growth forecast. CBMWD's population is estimated to grow at a rate of approximately 0.3 percent per year. The area is basically in a "built-out" or fully developed condition.

Table 2.2: Current & Projected Population (DWR Table 3-1 Wholesale)

Population Served	2020	2025	2030	2035	2040	2045
	1,569,510	1,634,295	1,650,548	1,670,318	1,685,027	1,703,597

2.2.3 LAND USE

Central Basin's service area encompasses 227 square miles in southeast Los Angeles County, which includes cities, water agencies, water districts, publicly-owned mutual water companies and publicly regulated utilities. This service area includes some of the most densely populated areas in Los Angeles County.

2.3 WATER USE WITHIN CBMWD'S SERVICE AREA

2.3.1 WATER USE BY CUSTOMER TYPE

Retail agency water consumption can be projected by understanding the type of use and customer type creating the demand. Developing local water use profiles on the retail level helps agencies to identify quantity of water used, and by whom within the Central Groundwater Basin. As a wholesale water agency, CBMWD purchases imported water from MWD and sells directly to retail agencies comprised of cities, mutual water companies, publicly regulated utilities and water districts. Additionally, CBMWD provides replenishment water for WRD to augment groundwater supplies within its boundaries.

The average retail agency in CBMWD service area relies on groundwater production for 70 percent of its water supply, while some agencies rely exclusively on groundwater to meet water demands.

2.3.2 SALES TO OTHER AGENCIES

CBMWD is a water wholesaler to agencies comprised of cities, mutual water companies, publicly regulated utilities and water districts. Each of these agencies sell drinking water at the retail level to residential, industrial, and commercial customers. **Table 2.3** contains a summary of CBMWD's total potable and raw water demand in the fiscal year (FY) 2019-20 within its service area. CBMWD does not sell groundwater to its retail agencies. Groundwater is pumped by the retail agencies to its customers. More information on the groundwater basins is discussed in Section 3. **Table 2.4** provides a breakdown of sales to CBMWD's retail agencies from 2015 to 2020.

Table 2.3: FY 19/20 CBMWD Retail Agencies Water Demands (AFY) (DWR Table 4-1 Wholesale)

Use Type	2020 Actual		
	Additional Description	Level of Treatment When Delivered	Volume
Sales to other agencies	Retail Agencies	Drinking Water	16,441
Sales to other agencies	WRD	Raw Water	0
Other	Groundwater Production	Drinking Water	165,619
TOTAL			182,060

Table 2.4: CBMWD Sales to Retail Agencies (AF) (2015 – 2020)

Retail Agency	Fiscal Year Ending					
	2015	2016	2017	2018	2019	2020
<i>Potable Water</i>						
City of Bell Gardens	243	92	47	23	34	440
Bellflower-Somerset Mutual Water Co	1	8	-	-	-	-
California Water Service Co - Commerce	347	165	444	394	352	694
California Water Service Co - East LA	7,577	4,297	5,329	4,793	4,534	4,384
City of Cerritos	652	1,188	-	-	3	83
City of Downey	-	-	-	-	-	-
City of Huntington Park	1,232	1,391	726	386	894	1,336
La Habra Heights County Water District	283	108	195	79	2	7
City of Lakewood	-	-	-	-	-	12
City of Lynwood	15	339	388	5	-	-
Maywood Mutual Water Company #1	105	171	396	16	-	6
Maywood Mutual Water Company #2	-	76	4	204	92	193
Maywood Mutual Water Company #3	-	-	-	-	-	-
City of Montebello	1,163	789	-	-	-	28
City of Norwalk	271	226	435	750	769	398
Orchard Dale Water District	-	-	109	-	-	-
City of Paramount	584	625	96	558	468	214
Liberty Utilities	7,163	4,963	6,098	4,275	1,411	2,371
Rancho Los Amigos – LA County	-	-	-	-	-	-
San Gabriel Valley Water Co	-	-	-	-	-	2
City of Santa Fe Springs	3,273	2,306	3,252	2,967	3,000	2,580
City of Signal Hill	337	67	249	344	13	1
Golden State Water Company	6,041	4,206	3,651	2,730	2,286	3,095
City of South Gate	-	-	-	-	-	-
Suburban Water Systems	23	6	22	79	219	62
City of Vernon	1,034	992	715	498	643	536
Walnut Park Mutual Water Co	-	-	-	-	-	-
Subtotal	30,345	21,945	22,157	18,101	14,721	16,441
<i>Raw Water (Untreated)</i>						
Water Replenishment District	25,015	19,635	32,689	9,792	5,340	-
Subtotal	25,015	19,635	32,689	9,792	5,340	-
Total Sales	55,360	41,580	54,846	27,892	20,060	16,441

2.3.3 NON-REVENUE WATER (INCLUDING "WATER LOSSES")

CBMWD does not own or operate any meters or treatment facilities. Furthermore, CBMWD does not own or operate any potable water distribution mains. Imported and exported water is metered by the providing entity and the end user, respectively. Therefore, CBMWD does not observe any measurable water losses.

2.4 WATER CONSERVATION ACT

2.4.1 SBX7-7 BACKGROUND

Due to reductions of water in the San Joaquin Delta, the Legislature drafted the Water Conservation Act of 2009 (SBx7-7) to protect statewide water sources. The legislation called for a 20 percent reduction in water use in California by the year 2020. The legislation amended the water code to call for 2020 and 2015 water use targets in the 2010 UWMPs, updates or revisions to these targets in the 2015 and 2020 UWMPs, and allows DWR to enforce compliance to the new water use standards. In essence, the bill requires each urban retail water supplier to develop urban water use targets to help meet the 20 percent goal by 2020 and an interim 10 percent goal by 2015.



Figure 2.2: SBx7-7 Seeks to Preserve Waters of the Bay-Delta

The bill establishes methods for urban retail water suppliers to determine their targets to help achieve statewide water reduction targets, which may or may not be at a strict 20 percent level. The retail water supplier must select one of the four target-setting methods. The retail water agency may also choose to comply with SBx7-7 as an individual or as a region in collaboration with other water suppliers. Under the regional compliance option, the retail water supplier still has to report the water use target for its individual service area. The bill also includes reporting requirements in the 2010, 2015, and 2020 UWMPs. Beginning in 2016, failure to comply with interim and final targets will make a retail agency ineligible for grants and loans from the State needed to attain water self-sufficiency by 2020; however, if an agency that is not in compliance documents a plan and obtains funding approval to come into compliance then could become eligible for grants or loans.

As a wholesale agency, CBMWD is not required to establish and meet baseline and targets for daily per capita water use; however, it is required to provide an assessment of its present and proposed future measures, programs and policies that will help its retail water suppliers achieve their SBx7-7 water use reduction targets. The Gateway Integrated Regional Water Management (Gateway IRWM) group which includes retail water agencies within CBMWD's service area has formed the Gateway Regional Water Conservation Alliance with the goal to meet SBx7-7 requirements as a region. The following section describes the regional alliance in more detail. The 2016 Gateway Regional Water Conservation Alliance Report is provided in **Appendix F**.

2.4.2 SBX7-7 PROVISIONS

In addition to an overall statewide 20 percent water use reduction, the objective of SBx7-7 is to reduce water use within each hydrologic region in accordance with the agricultural and urban water needs of each region. Currently, DWR recognizes 10 separate hydrologic regions in California as shown in **Figure 2.3**. Each hydrologic region is established for planning purposes and corresponds to the State's major drainage areas. CBMWD's member retail agencies are located in the South Coast Hydrologic Region (HR), which includes all of Orange County, most of San Diego and Los Angeles Counties, parts of Riverside, San Bernardino, and Ventura counties, and a small amount of Kern and Santa Barbara Counties. The South Coast HR is shown in **Figure 2.4**.

SBx7-7 recognizes different hydrologic regions and allows for conservation targets to be set based partly on regional targets.

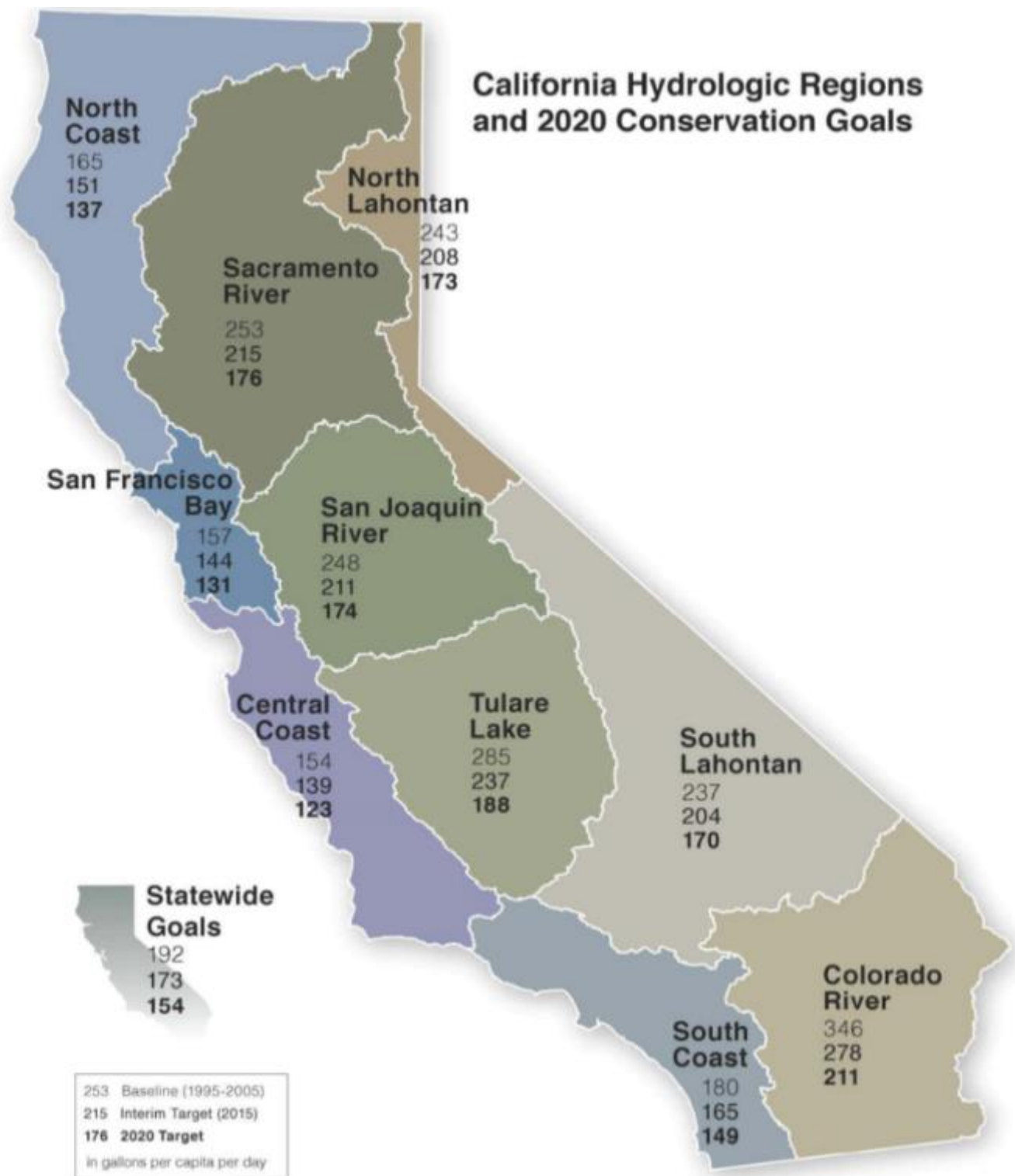


Figure 2.3: California's 2020 Water Conservation Goals



Figure 2.4: South Coast Hydrologic Region

Per capita water use, measured in gallons per capita per day (GPCD), in the South Coast HR varies between different water agencies depending on the geographic and economic conditions of the agency's service area. The South Coast HR has an overall baseline per capita water use of 180 GPCD and DWR has established a regional target of 149 GPCD as a compliance target to satisfy SBx7-7 legislation.

GATEWAY IRWM & REGIONAL ALLIANCE

In February 2011, the Gateway IRWM group formed a “regional alliance” to develop a regional plan to meet the interim 2015 and 2020 targets as indicated in SBx7-7 for retail water agencies in the Gateway IRWM. The Gateway regional alliance consists of 12 participating retail water agencies as shown in **Table 2.5**. Some of the Central Basin retail water agencies chose not to participate in the regional alliance because they are not required to submit an UWMP or they chose to comply with the SBx7-7 requirements individually.

Table 2.5: Gateway Regional Alliance Participating Agencies

Gateway Regional Alliance	
City of Downey	City of Lakewood
City of Long Beach	City of Lynwood
City of Norwalk	City of Paramount
City of Pico Rivera	Pico Water District
City of Santa Fe Springs	City of Signal Hill
City of South Gate	City of Whittier

SBX7-7 COMPLIANCE OPTIONS

DWR has established four compliance methods for urban retail water suppliers to choose from. Each supplier is required to adopt one of the four methods to comply with SBx7-7 requirements. The four options are shown in **Table 2.6** to the right.

These options were established in order to avoid placing any undue hardship on water agencies that have already been implementing water conservation measures. The basic procedure for determining the applicable water reduction target is illustrated by **Figure 2.5**. If an agency's 10-year baseline is slightly higher than the Hydrologic Region's target, that agency still must achieve a five percent reduction from its 5-year baseline.

If an agency has a per capita water use of 100 GPCD or less, that agency will not have to adhere to any reduction targets as that agency is already considered water efficient.

Table 2.6: DWR Compliance Methods

Methods	Description
Method 1	A strict 20 percent reduction from the baseline by 2020 and 10 percent by 2015
Method 2	A budget-based approach by requiring an agency to achieve a performance standard based on three metrics: <ul style="list-style-type: none"> Residential indoor water use of 55 GPCD Landscape water use commiserate with a Model Landscape Ordinance 10 percent reduction in baseline CII water
Method 3	Requires achievement of 95 percent of the applicable state hydrologic region target as set forth in the State's 20x2020 Water Conservation Plan
Method 4	Requires the subtraction of Total Savings from the Base GPCD: <ul style="list-style-type: none"> Total Savings includes indoor residential savings, meter savings, CII savings, and landscape and water loss savings

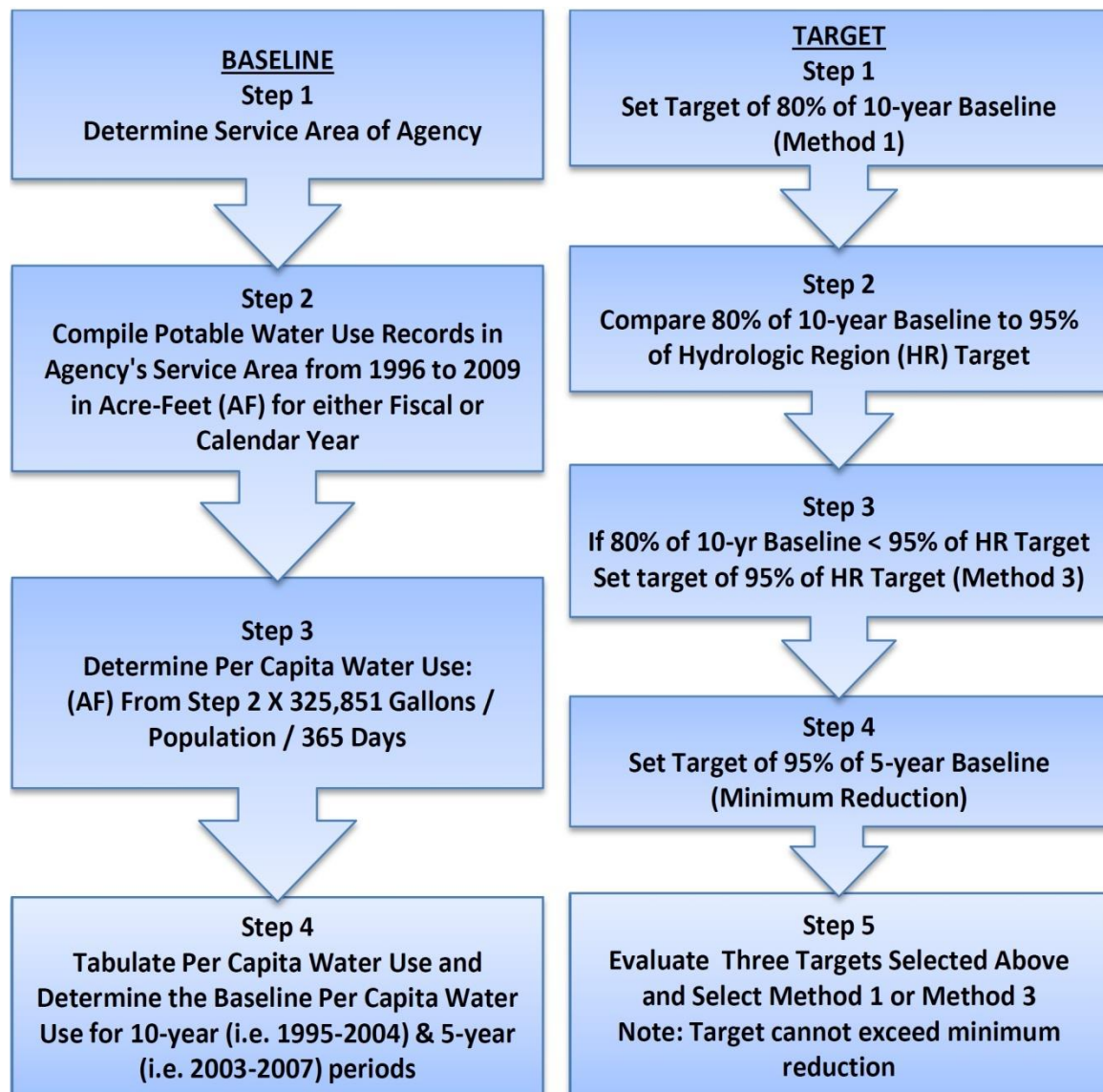


Figure 2.5: Procedure for Determining Baseline & Targets (Applies to Methods 1 & 3 Only)

The regional water use targets can be calculated using one of three options described in the 2015 UWMP Guidebook. These options are listed below:

- Option 1:** A population-weighted average. A target is calculated for an individual urban water supplier, using any method described above, and for any baseline period (ending between December 31, 2004 and December 31, 2010). An agency's target is then multiplied by the ratio of that agency's population to the total population. Summing the resulting values from all participating agencies yields the Regional 2020 Target.

- **Option 2 and Option 3:** An aggregate of individual agency water use and population information. There are slight differences between Option 2 and Option 3, but they can be similarly described. The water use and population information is summed for all participating agencies, and the regional base daily per capita water use is calculated for each year. The 10-year or 15-year baseline is calculated for the region, and one of the four methods described above is applied to obtain the 2020 Target.

Multiple Method-and-Option combinations were analyzed to calculate a 2020 Target that would best suit the Gateway Regional Alliance. While the Gateway Regional Alliance elected to calculate the 2020 Target using Option 1 with Method 1 and Method 3. Further detail in the calculations can be found in the 2016 Gateway Regional Water Conservation Alliance Report as shown in **Appendix F**.

SBX7-7 COMPLIANCE

CBMWD has several retail agencies which supply more than 3,000 AFY and have more than 3,000 connections. To satisfy the provisions of SBx7-7, these agencies previously established a per capita water use target for the year 2020 as well as an interim target (2015) on the 2015 UWMP. DWR provided guidelines for determining these targets in its *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use* first released in 2010 and then later revised in 2011 and 2016.

In the same fashion, these agencies were responsible for determining a 5-year baseline water use in accordance with DWR's guidelines. The *Methodologies* guidebook made provisions that allowed a water supplier to meet the target requirements by achieving any one of a number of target requirements, provided that the water supplier's per capita water use is low enough relative to the region within which it supplies water. The basic options included a minimum reduction requirement of 5 percent (Water Code § 10620), a 5 percent reduction from the Regional (South Coast HR) target (Water Code § 10608.20 (b) (3)), or a strict 20 percent reduction.

These retail agencies have chosen to report and comply individually. The interim and final water use targets to meet the 20 percent reduction in per capita use by 2020, as well as the technical methodology chosen to calculate the targets, are described in each of the retail agency's 2015 and 2020 UWMPs. Details on how CBMWD's retail members GPCD was calculated is described in their respective 2020 UWMPs.

The 2015 Interim and 2020 Targets for the Gateway Regional Alliance were previously calculated and determined in the 2015 UWMP. For 2020, the retail agencies must report

in their 2020 UWMP whether they met the 2020 Targets. The 2020 Gateway Regional Water Conservation Alliance Report will be complete after the submittal of CBMWD's 2020 UWMP.

2.5 PROJECTED CLIMATE CHANGE IMPACTS

Extensive research has been done on the future impacts due to climate change on the State of California. The state released its latest research on climate, called the California's Fourth Climate Change Assessment (California Assessment), detailing the potential impacts of climate change that affects California such as temperature, sea level rise, droughts, and wildfires. The assessment utilizes historic data and the latest computer models to analyze these potential impacts. Alongside with the California Assessment, released regional assessments as well. The California Assessment for the Los Angeles Region detail the major impacts of climate change in Los Angeles County as well as Ventura, Orange, San Bernardino, and Riverside County. The LA Region report outlines the key projected climate change impacts:

- Continued future warming over the LA region (max temperatures to increase by 4-5°F by mid-century and 5-8°F by late century)
- Extreme temperatures and number of extreme hot days is expected to increase
- Dry and wet extremes expected to increase
- Sea level projected to rise by 1-2 feet by mid-century and 8-10 feet by end of century based on most extreme projections
- Increased likelihood of wildfires throughout southern California

2.5.1 TEMPERATURE

The LA Region report of the California Assessment anticipates temperatures to increase throughout southern California. Studies indicated that based on historic records from 1896 – 2015 from the National Oceanic and Atmospheric Administration (NOAA) shows a trend of annual average, maximum, and minimum temperature increase of around 0.16°C per decade. In recent years, the top five warmest years in terms of annual average temperatures have occurred since 2012 where 2014 was the warmest followed by 2015, 2017, 2016, and 2012. Based on computer models (RCP4.5 and RCP8.5), the number of extremely hot days is expected to increase. For instance, historical records at the Los Angeles International Airport experiences nearly 15 days per year of temperatures equal to or greater than 90°F. Models project that the number of days may increase to 50-90 of such days per year by the end of the century.

2.5.2 PRECIPITATION

Precipitation for the LA region is also impacted by climate change. Based on historical records, precipitation is flexible from year to year and only five storms are typically observed per year making up roughly 50 percent of the annual precipitation total. As a result, precipitation in the LA region shows no typical trend. Based on the LA Region report of the California Assessment, dry and wet extremes are both expected to increase in the future. Based on computer models (RCP8.5), some areas are expected to have increased precipitation by 25-30 percent. Similarly, computer models also project increased periods of extremely dry years by double or more by the end of the century. The extreme dry years can lead to prolonged drought periods, significantly impacting water supplies within the region.

2.5.3 CLIMATE CHANGE IMPACTS TO WATER SUPPLY

Climate data has been recorded in California since 1858. Since then, California has experienced several periods of severe drought: 1928-34, 1976-77, 1987-91, 2007-09, and most recently in 2012-15. California has also experienced several periods of less severe drought. The year 1977 is considered to be the driest year of record in the Four Rivers Basin by DWR. These rivers flow into the Delta and are the source of water for the SWP. Southern California sustained few adverse impacts from the 1976-77 drought, but the 1987-91 drought created considerably more concern.

The drought of 2007-09 resulted in significant impacts on the state's water supplies. SBx7-7 was signed into law by Governor Schwarzenegger that requires mandatory water conservation up to 20 percent by 2020. The recent drought in 2012-15 brought a significant hit to the state's water supplies. The drought strained reservoir levels all across the state. **Table 2.7** compares the reservoir levels in October 2013 during the drought and in present day (February 2021). As shown, the majority of the state's reservoirs were all below average levels. To this day, California is still in a recovery stage from the recent droughts.

In January of 2014, Governor Brown declared a state of emergency and directed state officials to take all necessary actions to prepare for water shortages. As the drought prolonged into 2015, to help cope with the drought mitigation, Governor Brown issued an Executive Order in April 2015 that mandated a statewide 25 percent reduction in potable water use from a baseline year of 2013.

Table 2.7: California Reservoirs Level During Drought (2013) and Current (2021)

Reservoir	Drought Period (Oct. 30, 2013)	Current Levels (Feb. 9, 2021)	Historic Average
Trinity Lake	50%	51%	72%
Lake Shasta	38%	48%	70%
Lake Oroville	43%	36%	54%
New Melones Lake	43%	65%	108%
San Luis Reservoir	21%	54%	67%
Millerton Lake	54%	30%	47%
Perris Lake	45%	93%	114%
Castaic Lake	85%	77%	92%
Pine Flat Reservoir	16%	23%	47%
Lake McClure	25%	38%	77%
Don Pedro Reservoir	50%	68%	98%
Folsom Lake	30%	30%	57%

As a result, water demands with CBMWD's retail agencies has decreased as shown in **Figure 2.6**. Since 2006, water demands have dropped for both imported and groundwater. The severe low reservoir levels as well as groundwater levels caused water purveyors to mandate strict water usage guidelines in efforts to conserve water.

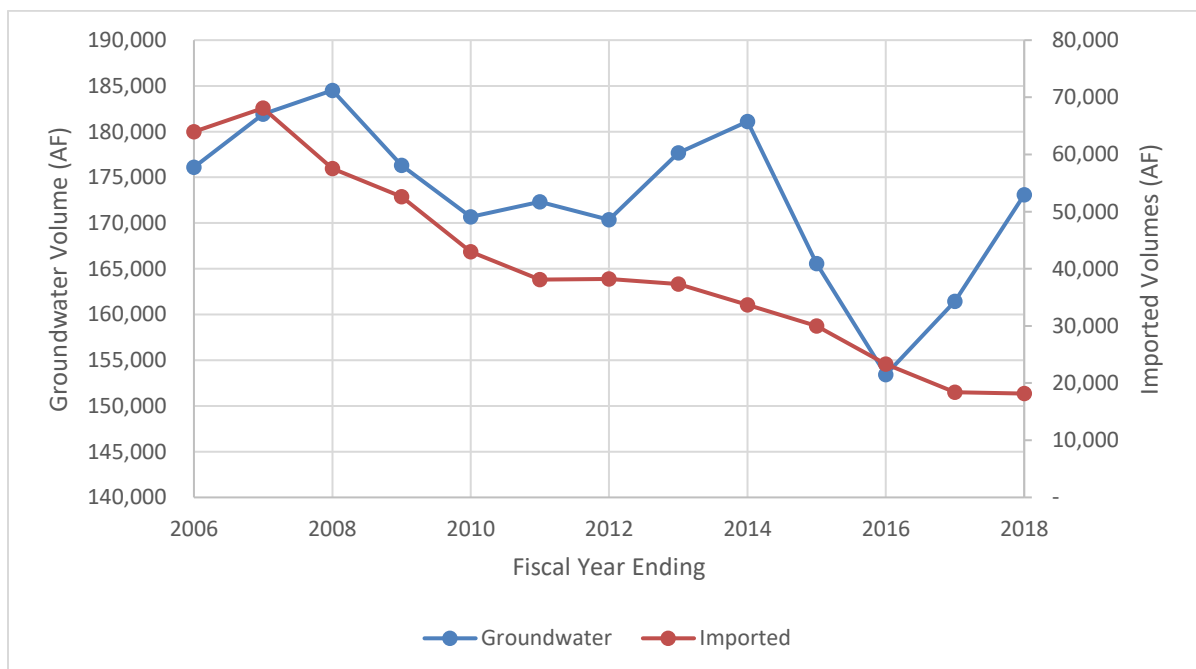


Figure 2.6: Total Groundwater and Imported Water Usage by CBMWD Retail Agencies (2006 - 2018)

2.6 WATER USE REDUCTION PLAN

2.6.1 ON-GOING WATER CONSERVATION EFFORTS

Wholesale agencies are required to include in their UWMPs an assessment of present and proposed future measures, programs, and policies that would help achieve the SBx7-7 requirements as well as continued water saving measures for the future. CBMWD assists its retail agencies with water use efficiency in its service area. CBMWD's goal is to administer conservation programs, including MWD rebate programs for its retail agencies. Before conservation program budgets are approved by the CBMWD's Board, they are vetted with the retail agencies. Because residential homes are the largest water use sector in the CBMWD service area, the focus of water conservation efforts continues to be residential rebate programs and public outreach programs. Single family residential homes with large landscapes are common in the CBMWD area. Therefore, much of CBMWD's outreach and conservation budget is used to promote outdoor conservation, such as sponsoring CA friendly landscaping classes for local residents and emphasizing MWD's California Friendly Landscape Education and Training Program. Additional outreach includes developing drought-tolerant demonstration gardens within the service area and periodic device giveaways at events, such as hose nozzles and low-flow showerheads. CBMWD also offers its own student education and public outreach programs to promote water use efficiency.

In addition to the SBx7-7 provisions, agencies also sought to manage the provisions of Governor Brown's Executive Order B-29-2015. Governor Brown granted this Executive Order in April 2015 that mandated a statewide 25 percent reduction in water use through February 28, 2016, as compared to the amount used in 2013. This executive order helped to further the goals of SBx7-7. Even after the strict 25 percent reduction was lifted, Californians continued to save water, with cumulative water use savings of about 22 percent between June 2015 and January 2017. As Governor Brown ended the drought state of emergency in most of California in April 2017 with Executive Order B-40-17, state agencies released a long-term plan that advanced measures to better prepare the state for future droughts and make conservation a California way of life.

With the drought state of emergency ended, state agencies prepared a long-term plan to make conservation a California way of life.

Through financial incentive programs and various public outreach campaigns and events

led by CBMWD, all retail agencies that must comply with SBx7-7 have achieved their water use reduction targets. Water demands in 2015 for two of the four retail agencies already meet the 2020 target under the third compliance option which is the achievement of 95 percent of the applicable state hydrologic region target as set forth in the state's 20x2020 Water Conservation Plan. This is due in part to Governor Brown's order.

2.6.2 FUTURE MWD PROGRAMS

OVERVIEW

In 2016, MWD, in collaboration with its member agencies, released the 2015 Update to the Integrated Water Resources Plan (IRP). The inaugural IRP was adopted in 1996, with previous updates in 2004 and 2010. The 2015 Update continues to assess and address how MWD plans to adapt to the changing conditions facing Southern California. The goals of the 2015 IRP include:

- Maintain Colorado River Aqueduct Supplies:** Develop programs to ensure that a minimum of 900,000 AF is available when needed, with access to 1.2 million acre-feet (MAF) in dry years.
- Stabilize State Water Project Supplies:** Manage SWP supplies in compliance with regulatory restrictions in the near-term for an average of 980,000 AF of SWP supplies. Pursue a successful outcome in the Delta Conveyance Plan and California EcoRestore efforts for long-term average supplies of about 1.2 MAF.
- Achieve Additional Conservation Savings:** Pursue further water conservation savings of 485,000 AF annually by 2040 through increased emphasis on outdoor water-use efficiency using incentives, outreach/education and other programs.
- Develop Additional Local Water Supplies:** Develop 230,000 AF of additional

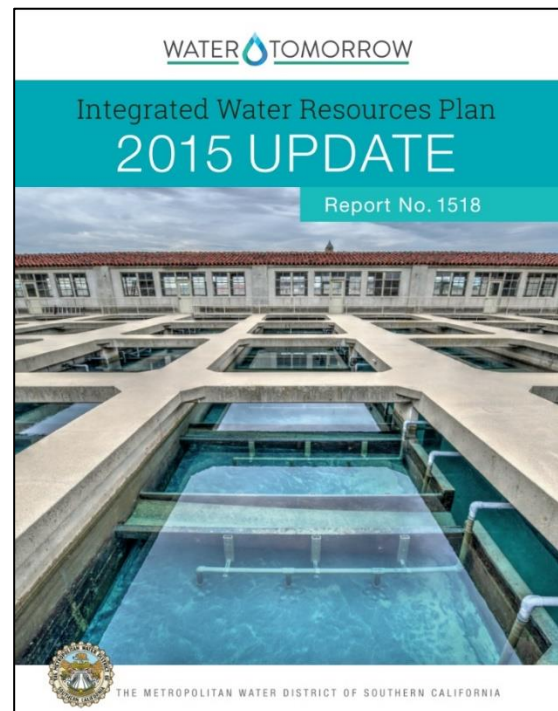


Figure 2.7: MWD's 2015 Integrated Water Resources Plan

local supplies produced by existing and future projects. The region would reach a target of 2.4 MAF by 2040, a key to providing water supply reliability into the future.

- **Maximize the Effectiveness of Storage & Transfer:** Develop a comprehensive strategy to pursue transfers and exchanges to hedge against shorter-term water demands and supplies imbalances until long-term solutions are in place.
- **Encourage Innovation:** Facilitate innovation in recycled water, desalination, stormwater capture and groundwater cleanup through a growing portfolio of initiatives, technologies and new ideas.

MWD is currently in the process of updating its IRP once again. The 2020 IRP is expected to be completed sometime in 2021.

2.7 DEMAND PROJECTIONS

2.7.1 25-YEAR PROJECTIONS

CBMWD demand projections shown in **Table 2.8** below are based on projections furnished by each of CBMWD's retail agencies. SBx7-7 requirements, population growth, and climate change impacts are also taken into account in the projections. **Table 2.9** compares current demands with the future demand projections. The table does include demands from Recycled Water which will be further discussed in Section 6.

Table 2.8: CBMWD's Demand Projections (AF) (DWR Table 4-2 Wholesale)

Use Type	Additional Description	Projected Water Use				
		2025	2030	2035	2040	2045
Sales to other agencies	Retail Agencies/ WRD	20,504	15,218	10,437	5,967	3,948
Other	GW Production	174,925	179,298	183,675	187,340	189,183
Other	GW Production / WQPP	3,467	3,554	3,642	3,734	3,827
TOTAL		198,896	198,070	197,754	197,041	196,958

Table 2.9: CBMWD Current & Projected Demands (AF) (Table 4-3 Wholesale)


	2020	2025	2030	2035	2040	2045
Potable and Raw Water	182,060	198,896	198,070	197,754	197,041	196,958
Recycled Water Demand	6,717	61,338	62,872	64,443	66,055	67,706
TOTAL WATER DEMAND	188,777	260,234	260,942	262,197	263,096	264,664

2.7.2 LOW INCOME HOUSEHOLD PROJECTIONS

One significant change to the UWMP Act that was included in the 2010 and 2015 UWMPs is the requirement that retail water suppliers develop water use projections for “low-income” households at the single-family and multifamily level. These projections assist retail suppliers with compliance with Section 65589.7 of the Government Code, which requires suppliers to grant a priority for the provision of service to low-income households. Consistent with this Code section, a low-income household is defined as a household earning 80 percent of the County of Los Angeles’ median income or less. CBMWD as a wholesale supplier is not subjected to these requirements. Water use projections for “low-income” households for CBMWD service area were established at the retail level. As recommended by DWR, CBMWD’s retail agencies relied on the Regional Housing Needs Assessment (RHNA) or Regional Housing Needs Plan information developed by the local council of governments (COG), in coordination with the California Department of Housing and Community Development, to identify the low-income housing projections within its service area.

The RHNA process quantifies the need for housing by income group within each jurisdiction during specific planning period and is used in Housing Element and General Plan updates. COGs are required by the State Housing Law to determine the existing and projected regional housing needs for persons at all income levels. The RHNA is to prioritize local resource allocation and to help decide how to address existing and future housing needs.

Existing and projected housing needs for Los Angeles County were incorporated into the 6th Cycle Final RHNA Allocation Plan of SCAG. This plan covers the planning period from October 2021 to October 2029. Water use projections for low-income households within the CBMWD service area can be found in the retail agencies’ 2020 UWMPs.



CBMWD's only source of supply is water purchased from MWD. The water received from MWD consists of water from the Colorado River and the State Water Project (pictured).

SECTION 3: WATER SOURCES & SUPPLY RELIABILITY

CENTRAL BASIN MUNICIPAL WATER DISTRICT | 2020 URBAN WATER MANAGEMENT PLAN

SECTION 3

WATER SOURCES & SUPPLY RELIABILITY

3.1 OVERVIEW

CBMWD is currently dependent upon MWD for 100 percent of its imported water supply. The District does not have groundwater supplies of its own. Most of its sub-agencies have access to their own groundwater supplies. Therefore, more than 50 percent of the demand in CBMWD's service area is met through local groundwater, and the remaining demand is met from groundwater recharge, recycled water and wholesale supplies purchased from MWD. There is also the Montebello Forebay that makes up a small percentage of local supplies. CBMWD's retail agencies plan to continue diversification of their water resources over the next 25 years with recycled water system expansions along with increased conservation efforts including groundwater storage opportunities. The District's dependence on imported sources will continue to decrease with the expansion of these alternative sources.

3.2 IMPORTED WATER

3.2.1 WATER SOURCES (MWD)

MWD has access to imported water from the Colorado River and the Sacramento-San Joaquin River Delta in Northern California. These two water systems provide Southern California with over 2 million acre-feet (MAF) of water annually for urban uses.

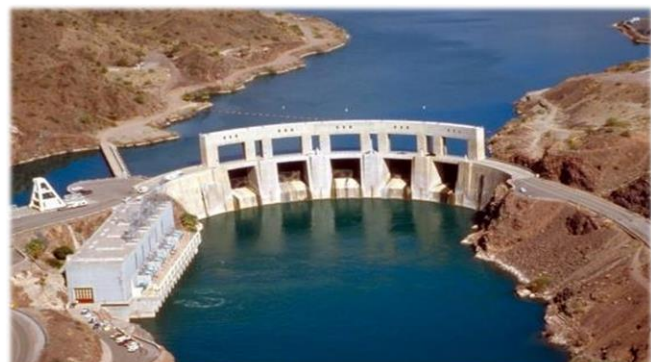


Figure 3.1: Parker Dam at Colorado River

COLORADO RIVER

The Colorado River supplies California with 4.4 MAF annually for agricultural and urban

uses with approximately 3.85 MAF used for agriculture in Imperial and Riverside Counties. The remaining unused portion (600,000 to 800,000 AF) serves urban purposes in MWD's service area. The use of Colorado River supplies is a critical issue as 13 years of drought continue to impact water levels in Lake Mead.

BAY-DELTA

In addition to the Colorado River, the Sacramento-San Joaquin River Delta (Delta) provides a significant amount of annual supply to Southern California. The Delta is located at the confluence of the Sacramento and San Joaquin Rivers east of the San Francisco Bay and is the West Coast's largest estuary. On average, the Delta supplies Southern California with over 1 MAF of water annually.



Figure 3.2: Sacramento-San Joaquin Delta

The use of water from the Delta continues to be a critical issue as it competes between uses for water supply and ecological habitat that jeopardizes the Delta's ability to meet either need and may threaten the estuary's ecosystem.

An ongoing planning effort to increase long-term supply reliability for both the State Water Project (SWP) and Central Valley Project (CVP) is taking place. This plan, formerly known as the Bay Delta Conservation Plan (BDCP), includes co-equal goals to improve water supply reliability and restore the Delta ecosystem. In April 2015, state and federal agencies announced a new sub-alternative, California WaterFix and California EcoRestore, which

replaced the proposed BDCP as the State’s preferred project. The new alternative reflects the State’s proposal to separate the conveyance facility and habitat restoration measures into two separate efforts: California WaterFix and California EcoRestore. These two efforts are a direct reflection of public comments and fulfill the requirement of the 2009 Delta Reform Act to meet co-equal goals. Preparation of the BDCP and now California WaterFix is through a collaboration of state, federal, and local water agencies, state and federal fish agencies, environmental organizations, and other interested parties. Several “isolated conveyance system” alternatives considered in the plan would divert water from the north Delta to the south Delta where pumped water travels into the south-of-Delta stretches of the SWP and CVP. The new conveyance facilities would allow for greater flexibility in balancing the needs of the estuary with the reliability of water supplies. The plan also provides other benefits, such as reducing the risk of long-term outages from Delta levee failures.

However, plans for the California WaterFix did not fall through as it did not gain support from Governor Newsom. In his speech to the state addressed in February 2019, Newsom announced that he did not “support WaterFix as currently configured,” but does “support a single tunnel”. As a result, on April of 2019, Governor Newsom issued Executive Order N-10-19, which announced a new single tunnel project known as the Delta Conveyance Project (DCP). Later that year, DWR initiated planning and environmental review for the DCP to protect the reliability of SWP supplies from the effects of climate change and seismic events, among other risks. DWR’s current schedule for the DCP environmental planning and permitting extends to the end of 2024. DCP will potentially be operational in 2040 following extensive planning, permitting, and construction.

AQUEDUCT SYSTEMS

In order to provide Southern California imported water, MWD utilizes two separate aqueduct systems (one for each source of supply) to obtain its supplies. These two aqueduct systems convey water from each source into distributed reservoir systems whereupon MWD pumps the water to one of its five treatment facilities. One of these aqueduct systems, known as the Colorado River Aqueduct (CRA), serves as MWD’s primary water delivery system and first constructed shortly after MWD’s incorporation in 1928. The CRA, which is owned and operated by MWD, spans 242 miles and conveys water from the Colorado River to Lake Mathews.

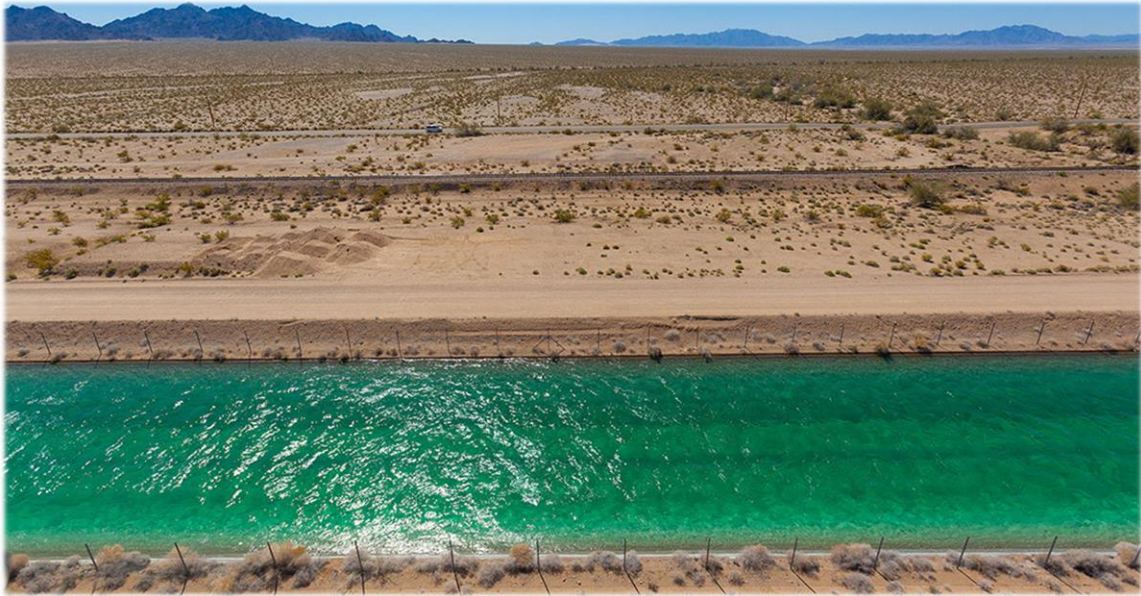


Figure 3.3: Colorado River Aqueduct

In addition to the CRA, MWD receives water from Northern California via the California Aqueduct. Also known as, the State Water Project (SWP), the California Aqueduct is 444 miles long, and carries Delta water to Southern California through operations by DWR.



Figure 3.4: California Aqueduct or "SWP"

The previously mentioned aqueducts supply Southern California with a significant amount of water and are crucial to its sustainability. In addition to these two water systems, there are also several other existing aqueducts vital to the State. The major aqueducts in California are shown in **Figure 3.5** on the following page.

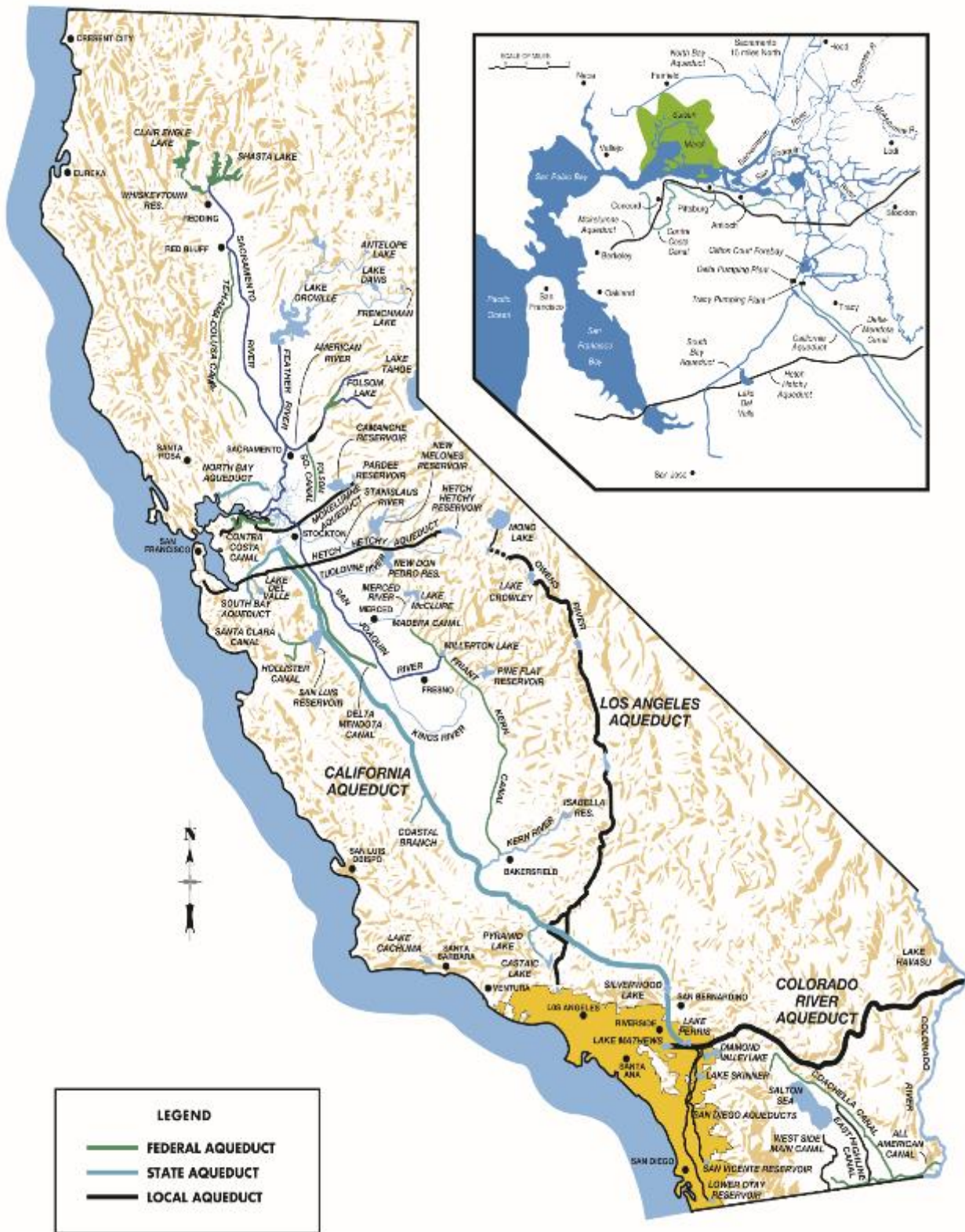


Figure 3.5: Aqueducts Systems in California

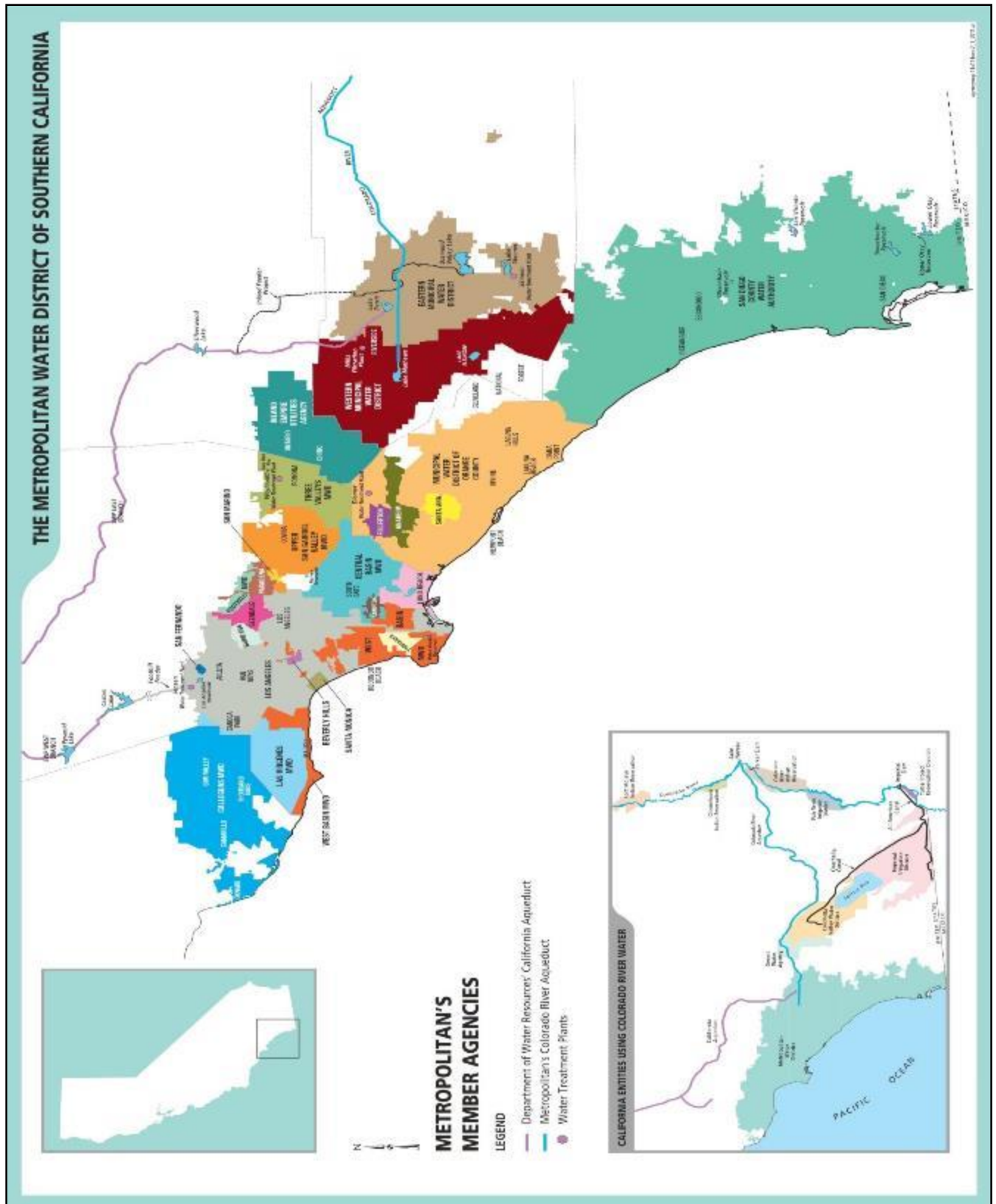


Figure 3.6: MWD Service Area Map

3.3 GROUNDWATER

Groundwater has for many years been the primary supply of water within CBMWD's service area. As mentioned previously, groundwater is neither sold or provided by CBMWD. The majority of CBMWD's retail members rely their groundwater supplies from the Central Groundwater Basin. This Basin is predominately comprised of a confined, pressurized aquifer system, with two large unconfined merged aquifer forebays, the Montebello Forebay and the Los Angeles Forebay. The other remainder of CBMWD's retail agencies utilizes groundwater from the Main San Gabriel Basin. This section will discuss in further detail on these two groundwater basins.

3.3.1 CENTRAL GROUNDWATER BASIN

The deteriorating groundwater situation in the Central Groundwater Basin (Central Basin) and in the adjoining West Coast Basin led to the formation of the Central Basin Water Association in 1950, a similar association was formed for the West Coast Basin. The Central Basin and West Coast Basin Associations were largely responsible for the creation of the Central and West Basin Water Replenishment District in 1959, known today as the Water Replenishment District of Southern California (WRD). Its objective is to replenish and maintain the groundwater basins by purchasing imported water, recharging the basins, and halting sea water intrusion.

The Central Basin covers approximately 270 square miles and is bounded on the north by the Hollywood Basin and the Elysian, Repetto, Merced, and Puente Hills; to the east by the Los Angeles County/Orange County line; and to the south and west by the Newport Inglewood Uplift, a series of discontinuous faults and folds that form a prominent line of northwest-trending hills including the Baldwin Hills, Dominguez Hills, and Signal Hill.

The Central Basin is divided into four sections—the Los Angeles Forebay, the Montebello Forebay, the Whittier Area, and the Pressure Area. The two forebays represent areas of unconfined aquifers that allow percolation of surface water down into the deeper production aquifers to replenish the rest of the basin. The Whittier Area and Pressure Area are confined aquifer systems that receive relatively minimal recharge from surface water, but are replenished from the upgradient forebay areas or other groundwater basins.

Groundwater in the Central Basin is recharged via surface spreading at the Whittier Narrows Dam, Montebello Forebay Spreading Grounds (MFSG), which consists of the Rio Hondo Spreading Grounds and San Gabriel Coastal Spreading Grounds, infiltration in the

unlined portions of the Lower San Gabriel River, and via direct injection at the Alamitos Barrier Project (ABP) shown in **Figure 3.8**. The lower San Gabriel River extends from the Whittier Narrows Dam through the Pacific coastal plain ending at Long Beach. Through most of the Montebello Forebay, the San Gabriel River is unlined, allowing spreading by percolation through its unlined bottom. The river is lined from about Firestone Avenue through the remainder of the Central Basin.



Figure 3.7: WRD's Service Area

Natural recharge to the Central Basin includes surface infiltration of precipitation and applied water (such as landscape irrigation), subsurface inflow from the surrounding mountains (referred to as mountain-front recharge), through the Los Angeles and Whittier Narrows and along the boundary with the Orange County Basin, and through stormwater percolation at the spreading grounds and unlined portions of rivers. Sources of artificial



Figure 3.8: Alamos Barrier Project Facilities

recharge include recycled water, imported water, and stormwater. The volume of recharge varies significantly from year to year based on precipitation and availability of imported water. Artificial replenishment of the basin via the spreading grounds and injection barrier has historically averaged approximately 142,500 AFY since 1959, whereas production has averaged approximately 205,000 AFY. Projects recently implemented and currently planned for implementation by WRD are increasing the amount of the artificial recharge from both stormwater and recycled water in the Central Basin.

The ABP is jointly owned by LACDPW and the Orange County Water District. As shown in **Figure 3.8**, the project can be divided into three major segments: (1) the main supply line that runs easterly and then southerly from the pressure reducing station to the T-vault, (2) the west leg that runs westerly to all injection wells west of the T-vault, and (3) the east leg that runs southerly and easterly to all injection wells east of the T-vault. Additionally, the City of Long Beach has four aquifer storage and recovery (ASR) wells that can be used to inject imported water available in wet years into the Central Basin. The combined injection capacity is estimated to exceed 3,250 AFY.

Groundwater Rights

Since the Central Groundwater Basin underwent an adjudication process in the early 1960's, the total amount of allowable extraction rights has remained the same. Some of the parties with groundwater pumping rights are located outside of Central Basin's service area.

3.3.2 MAIN SAN GABRIEL BASIN

Several of CBMWD's member agencies obtain their groundwater from the Main San Gabriel Basin (Main Basin). For the most part, the Main Basin coincides with the San Gabriel Valley floor, which is located in eastern Los Angeles County and overlies the majority of the San Gabriel Valley with a surface area of 167 square miles of valley terrain. The basin is bounded by the San Gabriel Mountains to the north, San Jose Hills to the east, Puente Hills to the south, Raymond Basin to the Northwest, and by a series of hills and the Whittier Narrows to the Southwest. The Main Basin serves as a natural storage reservoir, transmission system and filtering medium for wells constructed therein.

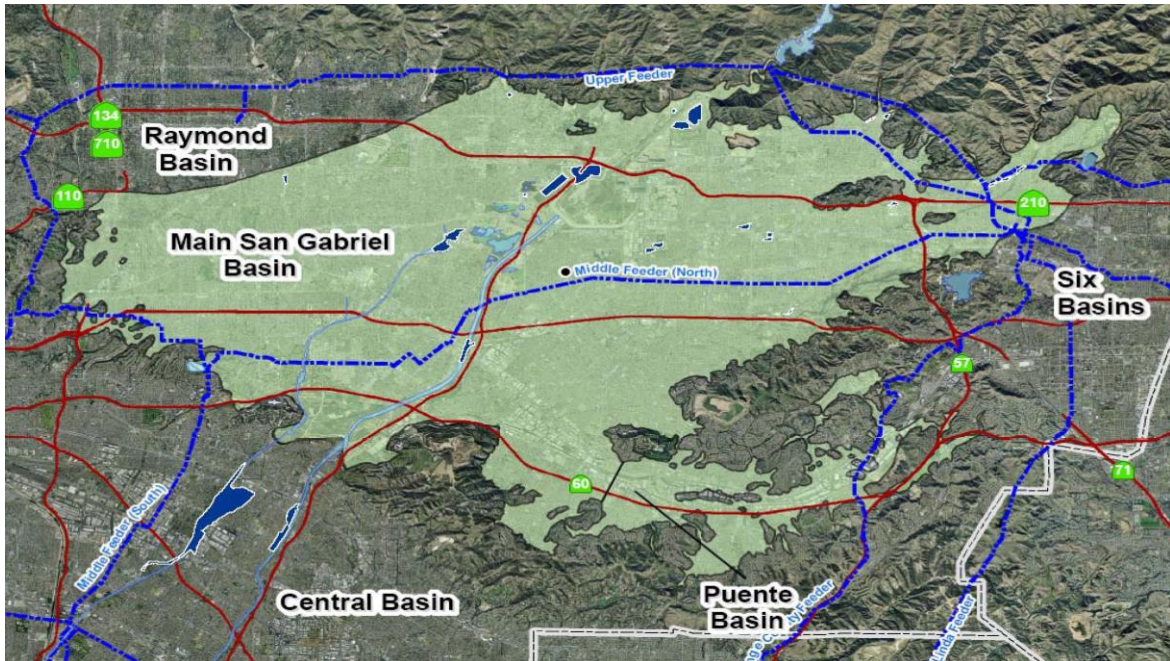


Figure 3.9: Map of Main San Gabriel Basin

Basin Geology

The Main Basin consists of a roughly bowl-shaped depression in the bedrock, filled with alluvial deposits. Materials within the Main Basin vary in size from relatively coarse gravel near the mountains to fine and medium-grained sand containing silt and clay as the distance from the mountains increases. The principal water-bearing formations are unconsolidated and semi-consolidated sediments which vary in size from coarse gravel to fine-grained sands. The interstices between these alluvial particles throughout the Main Basin fill with water and transmit water readily to wells.

Basin Hydrology

The major sources of replenishment to the Main Basin are direct penetration of rainfall on the valley floor, percolation of runoff from the mountains (from snowfall and rainfall), percolation of imported water and return flow from applied water. Rainfall occurs predominantly in the winter months and is more intense at higher elevations and closer to the San Gabriel Mountains. The magnitude of annual replenishment from direct penetration of local rainfall and return flow from applied water is not easily quantifiable. Percolation of runoff from the mountains and valley floor along with percolation of imported water have been estimated by the San Gabriel River Watermaster (River Watermaster). LACDPW maintains records on the amount of local and imported water conserved in water spreading facilities and stream channels.

The Main Basin is bisected by the San Gabriel River. The San Gabriel River originates at the confluence of its west and east forks in the San Gabriel Mountains. The San Gabriel River is joined and fed by tributary creeks and washes. In the Main Basin, these include: Big Dalton Wash, which originates in the San Gabriel Mountains; Walnut Creek, which originates at the northeast end of the San Jose Hills; and San Jose Creek, which originates in the San Gabriel Mountains, but which travels around the southerly side of the San Jose Hills through the Puente Narrows before joining the San Gabriel River just above Whittier Narrows.

The channel of the San Gabriel River bifurcates in the upper middle portion of the Main Basin, forming a channel to the west of and parallel to the San Gabriel River, known as the Rio Hondo. The Rio Hondo is fed by tributaries draining the westerly portion of the Main Basin, including Sawpit Wash, Santa Anita Wash, Eaton Canyon Wash, Rubio Wash and Alhambra Wash, all of which originate in the San Gabriel Mountains or the foothills. The Santa Anita Wash, Eaton Canyon Wash, Rubio Wash, and Alhambra Wash all cross the Raymond Basin area before entering the Main Basin. The Rio Hondo passes through Whittier Narrows westerly of the San Gabriel River, and then flows southwesterly to join the Los Angeles River on the Coastal Plain.

To protect residents of the San Gabriel Valley from flooding that can result during periods of intensive rainfall, the LACDPW and the U.S. Army Corps of Engineers have constructed an extensive system of dams, debris basins, reservoirs, and flood control channels. The dams and reservoirs also operate as water conservation facilities.

The dams and reservoirs that control the flow of the San Gabriel River and the Rio Hondo include: Cogswell Reservoir on the west fork of the San Gabriel River, San Gabriel Reservoir at the confluence of the west and east forks of the San Gabriel River, Morris Reservoir near the mouth of the San Gabriel Canyon, Santa Fe Reservoir in the northerly portion of the Basin, and Whittier Narrows Reservoir at the southwestern end of San Gabriel Valley.

Many of the stream channels tributary to the San Gabriel River have been improved with concrete banks (walls) and concrete-lined bottoms. These stream channel improvements have significantly reduced the area of previous stream channels and reduced Main Basin replenishment. A number of off-stream groundwater replenishment facilities have been established along these stream channels to offset such reductions in replenishment. Some of these facilities are accessible to imported water supplies, while some facilities receive only local runoff.

The paths of the surface streams are mirrored in the soils and in the direction of groundwater movement in the Main Basin. The tributary creeks and washes, carrying

smaller amounts of water, generally flow toward the center of the San Gabriel Valley, while the direction of flow of the major streams, the San Gabriel River and the Rio Hondo, is from the mountains in the north to Whittier Narrows in the southwest. In similar fashion, the primary direction of groundwater movement in the Main Basin is from the north to the southwest, with contributing movement generally from the east and west toward the center of the Main Basin. The greatest infiltration and transmissivity rates of soils in the Main Basin are from north to south, with the maximum rates found in the center of the valley along the stream channels. Generally, the Main Basin directs groundwater to the southwest through Whittier Narrows.



Figure 3.10: San Gabriel River Channel

The management of water resources in the Main San Gabriel Basin is provided by Watermaster services under two separate court judgments: The Long Beach Judgment and The Main Basin Judgment. The Long Beach Judgment established the River Watermaster, and the Main Basin Judgment established the Basin Watermaster. Through the Long Beach Judgment and the Main Basin Judgment, operations of the Main Basin are optimized to conserve local water to meet the needs of the parties of the Main Basin Judgment.

3.3.3 LONG BEACH JUDGMENT

On May 12, 1959, the Board of Water Commissioners of the City of Long Beach, the CBMWD, and the City of Compton, as plaintiffs, filed an action against the San Gabriel Valley Water Company and 24 other producers of groundwater from the San Gabriel Valley as defendants. This action sought a determination of the rights of the defendants in and to the waters of the San Gabriel River system and to restrain the defendants from an alleged interference with the rights of plaintiffs and persons represented by the Central Basin in such waters. After six years of study and negotiation a Stipulation for Judgment

was filed on February 10, 1965, and Judgment (Long Beach Judgment) was entered on September 24, 1965. Under the terms of the Long Beach Judgment, the water supply of the San Gabriel River system was divided at Whittier Narrows, the boundary between San Gabriel Valley upstream and the coastal plain of Los Angeles County downstream.

Under the terms of the Long Beach Judgment, the area downstream from Whittier Narrows (Lower Area), the plaintiffs and those they represent, are to receive a quantity of usable water annually from the San Gabriel River system comprised of usable surface flow, subsurface flow at Whittier Narrows and water exported to the Lower Area. This annual entitlement is guaranteed by the area upstream of Whittier Narrows (Upper Area), the



Figure 3.11: San Gabriel River Upper Regions

defendants, and provision is made for the supply of Make-up Water by the Upper Area for years in which the guaranteed entitlement is not received by the Lower Area.

Make-up water is imported water purchased by the Main Basin Watermaster and delivered to agencies in Central Basin to satisfy obligations under the Long Beach Judgment. The entitlement of the Lower Area varies annually, dependent upon the 10-year average annual rainfall in San Gabriel Valley for the 10 years ending with the year for which entitlement is calculated.

The detailed operations described in the Long Beach Judgment are complex and require continuous compilation of data so that annual determinations can be made to assure compliance with the Long Beach Judgment. In order to do this, a three-member Watermaster was appointed by the Court, one representing the Upper Area parties nominated by and through Upper San Gabriel Valley Municipal Water District, one representing the Lower Area parties nominated by and through the Central Basin, and one jointly nominated by Upper District and Central Basin. This three-member board is known as the San Gabriel River Watermaster.

The River Watermaster meets periodically during the year to adopt a budget, to review activities affecting water supply in the San Gabriel River system area, to compile and review data, to make its determinations of usable water received by the Lower Area, and

to prepare its annual report to the Court and to the parties. The River Watermaster has rendered annual reports for the water years 1963-64 through 2013-14 and operations of the river system under that Court Judgment and through the administration by the River Watermaster have been satisfactory since its inception.



Figure 3.12: San Gabriel River Lower Regions

One major result of the Long Beach Judgment was to leave the Main San Gabriel Basin free to manage its water resources so long as it meets its downstream obligation to the Lower Area under the terms of the Long Beach Judgment.

3.3.4 MAIN BASIN JUDGMENT

The Upper Area then turned to the task of developing a water resources management plan to optimize the conservation of the natural water supplies of the area. Studies were made of various methods of management of the Main Basin as an adjudicated area and a report thereon was prepared for the Upper San Gabriel Valley Water Association, an association of water producers in the Main Basin. After due consideration by the Association membership, Upper District was requested to file as plaintiff, and did file, an action on January 2, 1968, seeking an adjudication of the water rights of the Main San Gabriel Basin and its Relevant Watershed. After several years of study (including verification of annual water production) and negotiations, a stipulation for entry of Judgment was approved by a majority of the parties, by both the number of parties and the quantity of rights to be adjudicated. Trial was held in late 1972, and Judgment (Main Basin Judgment) was entered on January 4, 1973.

Under the terms of the Main Basin Judgment all rights to the diversion of surface water and production of groundwater within the Main Basin and its Relevant Watershed were adjudicated. The Main Basin Judgment provides for the administration of the provisions of the Main Basin Judgment by a nine-member Watermaster. Six of those members are nominated by water producers (producer members) and three members (public members) are nominated by Upper District and San Gabriel Districts which overlie most of the Main Basin. The nine-member board employs a staff, an attorney, and a consulting engineer. The Main Basin Watermaster holds public meetings on a regular monthly basis throughout the year.

The Main Basin Judgment does not restrict the quantity of water which Parties may extract

from the Basin. Rather, it provides a means for replacing all annual extractions in excess of a Party's annual right to extract water with Supplemental Water. The Main Basin Watermaster annually establishes an Operating Safe Yield for the Main Basin, which is then used to allocate to each Party its portion of the Operating Safe Yield which can be produced free of a Replacement Water Assessment. If a producer extracts water in excess of its right under the annual Operating Safe Yield, it must pay an assessment for Replacement Water which is sufficient to the purchase of 1 acre-foot of Supplemental Water to be spread in the Main Basin for each acre-foot of excess production. All water production is metered and is reported quarterly to the Main Basin Watermaster.

In addition to Replacement Water Assessments, the Main Basin Watermaster levies an Administration Assessment to fund the administration of the Main Basin management program under the Court Judgment and a Make-up Obligation Assessment in order to fulfill the requirements for any make-up Obligation under the Long Beach Judgment and to supply 50 percent of the administration costs of the River Watermaster service. The Main Basin Watermaster levies an In-lieu Assessment and may levy special Administration Assessments.

Water rights under the Main Basin Judgment are transferable by lease or purchase so long as such transfers meet the requirements of the Judgment. There is also provision for Cyclic Storage Agreements by which Parties and non-parties may store imported Supplemental Water in the Main Basin under such agreements with the Main Basin Watermaster pursuant to uniform rules and conditions and Court approval.

The Main Basin Judgment provides that the Main Basin Watermaster will not allow imported water to be spread in the central part of the Main Basin when the groundwater elevation at the Baldwin Park Key Well (Key Well) exceeds 250 feet; and that the Main Basin Watermaster will, insofar as practicable, spread imported water in the Main Basin to maintain the groundwater elevation at the Key Well above 200 feet. One of the principal reasons for the limitation on spreading imported water when the Key Well elevation exceeds 250 feet is to reserve ample storage space in the Basin to capture native surface water runoff when it occurs and to optimize the conservation of such local water. Under the terms of the Long Beach Judgment, any excess surface flows that pass through the Main Basin at Whittier Narrows to the Lower Area (which is then conserved in the Lower Area through percolation to groundwater storage) is credited to the Upper Area as Usable Surface Flow.

Through the Long Beach Judgment and the Main Basin Judgment, operations of the Main Basin are optimized to conserve local water to meet the needs of the parties of the Main Basin Judgment.

Imported water for groundwater replenishment is delivered to the flood control channels and diverted and spread at spreading grounds through Main Basin Watermaster's agreement with the LACDPW. Groundwater replenishment utilizes imported water and is considered Replacement Water under the terms of the Main Basin Judgment. It can be stored in the Main Basin through Cyclic Storage agreements, authorized by terms of the Main Basin Judgment, but such stored water may be used only to supply Supplemental Water to the Main Basin Watermaster.

The Main Basin Watermaster has entered into a Cyclic Storage Agreement with each of the three municipal water districts. One is with the MWD and Upper District, which permits MWD to deliver and store imported water in the Main Basin in an amount not to exceed 100,000 AF for future Replacement Water use. The second Cyclic Storage Agreement is with TVMWD and permits MWD to deliver and store 40,000 AF for future Replacement Water use. The third is with San Gabriel District and contains generally the same conditions as the agreement with MWD except that the stored quantity is not to exceed 50,000 AF. As of February 2016, San Gabriel District had about 2,164 AF in its Cyclic Storage account.

Imported Make-up Water is often delivered to lined stream channels and conveyed to the Lower Area. Make-up Water is required to be delivered to the Lower Area by the Upper Area when the Lower Area entitlement under the Long Beach Judgment exceeds the usable water received by the Lower Area. Imported water is used to fulfill the Make-up Water Obligation when the amount of Make-up Water cannot be fulfilled by reimbursing the Lower Area interests for their purchase of recycled water. The amount of recycled water for which reimbursement may be made as a delivery of Make-up Water is limited by the terms of the Long Beach Judgment to the annual deficiency in Lower Area Entitlement water or to 14,735 AF, whichever is the lesser quantity.

3.4 WATER QUALITY

In 1974, Congress passed the Safe Drinking Water Act in order to protect public health by regulating the nation's drinking water supply. As required by the Safe Drinking Water Act, CVWD provides annual Water Quality Reports to its customers.

The two main sources of CBMWD's retail members water supply are imported water from MWD water and groundwater from the Central and Main Basin. Since MWD draws the majority of its water from the CRA and the SWP, the quality of CBMWD's imported water



Figure 3.13: Health Standards Protect Drinking Water

supply is closely related to the quality of these two sources.

3.4.1 IMPORTED WATER QUALITY

CBMWD takes delivery of its entire water supply at an existing single connection along the MWD Upper Feeder. MWD treats the water provided to CBMWD at the F.E. Weymouth treatment plant located in La Verne, CA. The F.E. Weymouth filtration plant is a conventional treatment plant with a capacity of 520 million gallons per day (MGD).

MWD is responsible for providing CBMWD with water that meets all drinking water regulations contained in California's Title 22 and federal regulations contained in the Code of Federal Regulations, Volume 40, Section 141. CBMWD does not provide any additional treatment prior to delivery of water to its customers; however, CBMWD operates its distribution system in a manner that maintains the water quality of the water received from MWD.

MWD's supplies originate from the CRA and from the SWP. Both supplies are generally of high quality; however, both supplies face water quality challenges.

SALINITY

Colorado River Aqueduct - Water imported from the Colorado River via the CRA has the highest level of salinity of all of MWD's sources of supply, averaging around 630



Figure 3.14: MWD's Weymouth Treatment Plant Provides a Safe Supply of Water

milligrams per liter (mg/L). The salts found in the Colorado River system are indigenous and pervasive, mostly resulting from saline sediments in the Basin and deposits from prehistoric marine environments. The salts are susceptible to erosion, and frequently dissolve and travel into the river system. To offset these salinity levels, CRA water often blends (mixed) with lower-salinity water from the SWP to meet MWD's flow-weighted total dissolved solids (TDS) standard of 500 mg/L for imported water. However, due to limited availability during the recent drought, MWD treated lower blends of SWP supply resulting in TDS averages above MWD's goal of 500 mg/L.



Figure 3.15: Native Rock adds to the Salinity of the Colorado River Water Supplies

State Water Project - SWP supplies have significantly lower TDS concentrations when compared to the Colorado River, averaging approximately 250 mg/L from the SWP East Branch and 325 mg/L from the SWP West Branch according to MWD's 2020 UWMP.

Because of SWP's lower salinity level, MWD blends SWP water with CRA to reduce the salinity of the delivered water. MWD has set a salinity objective for delivered water in its Salinity Management Policy of less than of 500 mg/L of TDS.

PERCHLORATE

Perchlorate is both a naturally occurring and manmade contaminant increasingly found in groundwater, surface water, and soil. Perchlorate, known to inhibit the thyroid's ability to produce growth and development hormones, was first detected in Colorado River water in June of 1997 and traced back to the Las Vegas Wash.

Perchlorate, unlike other contaminants, does not tend to interact readily with soil and does not degrade in natural environments. Conventional drinking water treatment, used at MWD's water treatment facilities, is not effective in removing perchlorate. Mitigation efforts are the most viable option for removing perchlorate from drinking water. To facilitate perchlorate remediation of the Colorado River, MWD and other federal and state agencies collaborated to reduce and prevent perchlorate contamination issues in the Colorado River. According to MWD's Annual Report 2015, mitigation efforts have been successful in reducing perchlorate loading into the Las Vegas Wash by more 90 percent since 1998.

As of October 2007, the State Water Resources Control Board Division of Drinking Water (DDW) has established a perchlorate maximum contaminant level (MCL) of 6 micrograms per liter ($\mu\text{g/L}$). DDW is currently in the process of reviewing the updated public health goal MCL of 1 $\mu\text{g/L}$ established in 2015 by U.S. Environment Protection Agency (EPA) Office of Environmental Health Hazard Assessment (OEHHA). MWD routinely monitors perchlorate within its system, and levels currently remain at non-detectable levels (below 2 $\mu\text{g/L}$). MWD has not detected perchlorate in the SWP since monitoring began in 1997.

DISINFECTION BYPRODUCTS FORMED BY REACTING WITH TOTAL ORGANIC CARBON AND BROMIDE

Disinfection byproducts (DBPs) are contaminants affecting SWP supplies. When source water containing high levels of total organic carbon (TOC) and bromide meets disinfectants, such as chlorine, disinfection byproducts form. Elevated levels of DBPs may link to adverse health effects, including certain cancers.

TOC and bromide levels are significantly high throughout the Delta due to agricultural drainage and seawater intrusion. Because of these high levels of TOC and bromide, in August 2000, CALFED adopted water quality goals for the Bay-Delta region that specify standards of bromide and TOC for drinking water in order to protect public health. The federal government took action to regulate DBP contaminants in 2002 and 2006 when EPA introduced new regulations to protect against the risk of DBP exposure.

While lower in salinity, SWP supplies are much higher in chemical content due to the agriculture of the Bay-Delta region.

MWD has taken several steps to decrease DBP presence in SWP water supplies. In 2003 and 2005, MWD completed upgrading two of its water treatment plants, Mills and Jensen, to utilize ozone as the primary disinfectant, preventing the formation of DBPs that would normally form in chlorine treatment of SWP water. In 2010, 2015, and 2017, MWD completed ozone upgrades at Skinner, Diemer, and Weymouth water treatment plants, respectively.

NUTRIENTS

Elevated nutrient levels in the SWP can adversely affect MWD's imported water quality by stimulating biomass growth such as algae and aquatic weeds. Nutrients can also provide a source of food leading to the growth of nuisance biological species. This can lead to taste and odor concerns and can impede normal treatment operations. MWD offsets the nutrient rich SWP water by blending it with CRA water in MWD's blend reservoirs. Although nutrient loading is a concern and is anticipated to have cost implications, with its comprehensive monitoring program and response actions to manage algal related issues, there should be no impact on availability of water supplies. MWD's source water protection program will continue to focus on preventing future increases in nutrient loading as a result of urban and agricultural sources.

ARSENIC

Arsenic is a naturally occurring element found in rocks, soil, water, and air. Arsenic typically has presence in wood preservatives, alloying agents, certain agricultural applications, semi-conductors, paints, dyes, and soaps. It can travel into water from the natural erosion of rocks, dissolution of ores and minerals, runoff from agricultural fields, and discharges from industrial processes. Long-term exposure to elevated levels of arsenic in drinking water may link to certain cancers, skin pigmentation changes, and hyperkeratosis (skin thickening).

In April 2004, OEHHA set a public health goal for arsenic of 0.004 µg/L. The MCL for arsenic in domestic water supplies lowered to 10 µg/L on January 2006 in the federal regulations and on November 2008 in the California regulations. The standard affects both groundwater and surface water supplies. Historically, MWD's water supplies have had low levels of this contaminant and did not require treatment changes or capital investment to comply with the standard.

The detection limit for purposes of reporting (DLR) for arsenic is 2 µg/L. Between 2010 and June 2020, arsenic levels in MWD's water treatment plant effluents ranged from non-detect (< 2 µg/L) to 3.3 µg/L. For MWD's source waters, levels in the Colorado River water have ranged from 2.2 to 2.8 µg/L, while levels in SWP water have ranged from non-detect to 4.8 µg/L. Increasing coagulant doses at water treatment plants can reduce arsenic levels for delivered water.

URANIUM

Uranium is a naturally occurring radioactive material that has known cancer risks. Uranium can infiltrate a water source either directly or indirectly through groundwater seepage. Due to past uranium mill activities near the Colorado River, a 16-million-ton pile of uranium mill tailings exists that has the potential for contamination. Ongoing remediation actions are successful at removing the tailings and contaminated groundwater from the site. Although uranium levels measured at MWD's intake are below State MCL levels, MWD has only limited ability to remove uranium through traditional treatment, and thus mitigation methods are crucial to avoiding uranium contamination.

CHROMIUM VI

Chromium VI is a drinking water contaminant of concern. Hexavalent chromium is used in electroplating stainless-steel production, tanning leather, manufacturing textiles, manufacturing dyes and pigments, and preserving wood as an anti-corrosion agent. Chromium VI is a health hazard to humans, causing cancer when inhaled; however, the long-term health effects of ingested chromium VI are currently being determined. In July 2014, an MCL of 10 µg/L for hexavalent chromium became effective for drinking water. California also regulates the total chromium (including chromium III and chromium VI) in drinking water as an MCL of 50 µg/L. In May 2017, the Superior Court of Sacramento County issued a judgment invalidating the MCL on the basis that CDPH (now DDW), had not properly considered the economic feasibility of complying with the MCL. DDW therefore rescinded the chromium VI MCL; however, chromium VI remains regulated as part of total chromium which does have an MCL. In February 2020, DDW released a white

paper discussion on an updated economic feasibility analysis of chromium VI treatment for the consideration of a new chromium VI MCL. Over the past five years, the Colorado River water supply has contained levels of chromium VI that are mainly less than 0.03 µg/L but also ranging from 0.03 to 0.085 µg/L. SWP's water supply has contained levels ranging from 0.03 to 1.0 µg/L.

1, 2, 3 – Trichloropropane (1,2,3-TCP)

1,2,3-TCP is a chlorinated hydrocarbon with high chemical stability. It is a manmade chemical found at industrial or hazardous waste sites. It has been used as a cleaning and degreasing solvent and also is associated with pesticide products. In July 2017, SWRCB adopted an MCL of 5 parts per trillion (ppt) for 1,2,3-TCP and related requirements, including establishing a DLR, identifying the best available technology for treatment, and setting public notification and consumer confidence report language. The regulations also included a method for public water systems to substitute existing water quality data for initial monitoring requirements under certain circumstances. Under the new regulation, drinking water agencies are required to perform quarterly monitoring of 1,2,3-TCP. To this day, there have been no detections of 1,2,3-TCP in MWD's system.

N-NITROSODIMETHYLAMINE

N-Nitrosodimethylamine (NDMA) is an emerging contaminant of drinking water. NDMA forms as a disinfection byproduct when source waters containing certain organic material mix with chloramines at treatment plants. EPA and DDW consider NDMA to be a probable human carcinogen; however, neither has yet established an MCL. Since 1998, DDW has kept a notification level of 0.01 µg/L. In addition, in December 2006, OEHHA set a public health goal for NDMA of 0.003 µg/L. Since 1999, MWD has conducted voluntary monitoring of the five treatment plant effluents and representative distribution system locations semi-annually. NDMA is the only detected nitrosamine in MWD's treated water systems, and it is in the range of non-detect (<0.002 µg/L) to 0.006 µg/L.

PHARMACEUTICALS AND PERSONAL CARE PRODUCTS

Pharmaceuticals and personal care products (PPCPs) have recently become contaminants of concern for water supplies. Discoveries of PPCPs include trace amounts found in treated wastewater, surface water, and sometimes even in finished drinking water. Currently, there is no detected health hazard associated with long-term exposure to low concentrations (low nanograms per liter (ng/L); parts per trillion) of PPCPs found in some drinking water. No state or federal regulations currently exist to regulate this contaminant.

MICROPLASTICS

In 2018, Senate Bill No. 1422 added section 116376 to the Health and Safety Code, which required the State Water Board to adopt a definition of microplastics in drinking water on or before July 1, 2020. On June 16, 2020, the SWRCB adopted a definition acknowledging the definition is a work in progress, and stated the State Water Board will re-visit the microplastic definition as knowledge in the field progresses. MWD is participating in a study with the Southern California Coastal Water Research Project to develop analytical methods for microplastics.

PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

Drinking water containing perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS) – and the larger family of per- and polyfluoroalkyl substances (PFAS) – has become an increasing concern due to the persistence of these chemicals in the environment and their tendency to accumulate in groundwater. In August 2019, DDW updated its guidelines for local water agencies to follow in detecting and reporting the presence of these chemicals in drinking water. The guidelines lower the notification levels from 14 ppt to 5.1 ppt for PFOA and from 13 ppt to 6.5 ppt for PFOS. These levels are based on updated health recommendations from OEHHA, which is part of the EPA. Notification levels are non-regulatory, precautionary health-based measures for concentrations of chemicals in drinking water that warrant notification and further monitoring and assessment. If a chemical concentration is greater than its notification level in drinking water that is provided to consumers, DDW recommends that the utility inform its customers and consumers about the presence of the chemical, and about health concerns associated with exposure to it. Legislation that took effect on January 1, 2020 (California Assembly Bill 756), requires that water systems that receive a monitoring order from SWRCB and detect levels of PFAS that exceed their respective response level must either take a drinking water source out of use or provide specified public notification if they continue to supply water above the response level.

MWD has not detected PFOA or PFOS in its raw water. In 2019, NWD detected in its supplies low levels of perfluorohexanoic acid, which is not acutely toxic or carcinogenic and is not currently regulated in California or at the federal level. No other PFAS have been detected in MWD's imported or treated supplies; however, some of its member agencies have experienced detections in their groundwater wells. As DDW moves to establish an MCL for PFOA/PFOS, MWD's member agencies may be confronted with the choice of implementing treatment or inactivating their affected sources to remain in compliance with DDW regulations. This may cause those systems to supplement their water needs with increased purchases of MWD's water.

WATER QUALITY IMPACTS

MWD's primary sources of water, the CRA and SWP, face individual water quality issues of concern. The CRA water source contains a higher level of TDS and a lower level of organic materials, while the SWP contains a lower TDS level and a much higher level of organic materials. To remediate the CRA's high level of salinity and the SWP's high level of organic materials, MWD practices regular blending of CRA water with SWP supplies as well as implementing updated treatment processes to decrease disinfection byproduct formation. In addition, MWD engages in efforts to protect its Colorado River supplies from threats of uranium, perchlorate, and chromium VI while also investigating the potential water quality impacts of emerging contaminants, such as NDMA and PPCPs. MWD assures its ability to overcome the above-mentioned water quality concerns through its protection of source waters, implementation of renovated treatment processes, and blending of its two sources. While unforeseeable water quality issues could alter reliability, MWD's current strategies ensure the deliverability of high-quality water. Because of these efforts, MWD's 2020 UWMP indicates that none of the water quality challenges described below will affect the reliability of its supplies over the course of the next 20 years.

Because of ongoing treatment efforts, MWD does not expect water quality concerns to impact supply reliability.

Table 3.1 shows the projected volumetric impact in AFY that water quality constituents will have on MWD's supply. As indicated below, MWD estimates no changes to water supply due to water quality impacts through 2040.

Table 3.1: Water Quality - Current & Projected Water Supply Impacts (AFY)

Water Source	2020	2025	2030	2035	2040	2045
Imported	0	0	0	0	0	0

3.4.2 GROUNDWATER QUALITY

Groundwater in the Central Basin is continually monitored for the quality of the water because of its susceptibility to seawater intrusion, potential contamination from adjacent basins and migration of shallow contamination into deeper aquifers. The Alamitos Barrier, located in the southwest portion of Central Basin's service area, provides a buffer between the groundwater basin and seawater intrusion. The available supply of replenishment water to physical recharge the Basin includes local and imported water. The local water that recharges the groundwater basin comes from storm flows from the

San Gabriel Valley and flow obligations under the San Gabriel River Judgment with the Upper Area of the Central Basin. This water is defined as “Make-Up” Water.” Imported water is purchased from MWD to be used for surface spreading at the Montebello Forebay and for seawater barrier injection at the Alamitos Barrier. Recycled water is purchased from the LACSD for blending with imported water and stormwater infiltration for spreading and injection.

WATER QUALITY PROTECTION PROJECT

In the early 1980’s, the San Gabriel Valley aquifer was discovered to have contaminants including trichloroethylene and perchloroethylene in the water supply. Based on the contamination level, the Environmental Protection Agency declared the area as a superfund site. As the contamination plume moved south toward the Central Groundwater Basin over the next 20 years and threatened the local groundwater supplies, Central Basin developed a containment plan known as the Water Quality Protection Project (WQPP).

By taking necessary steps to ensure removal of the contaminants, it prevented any further migration of contamination from the San Gabriel Valley into the Central Groundwater Basin and from reaching the spreading grounds. The cleanup of the aquifer produces a safe and reliable potable water supply to participating groundwater producers. Central Basin obtained necessary Federal funds for implementation of the WQPP with the objective of preventing further migration of contaminants into the Central Groundwater Basin. The federally funded project consists of two extraction wells with a collector pipeline and treatment facility. The extraction wells pump out the contaminated groundwater at a combined rate of approximately 3,600 gallons per minute and convey it via the collector pipeline to the central treatment facility where it is treated with a granular-activated carbon system for purification. The treated water continues to surpass California’s stringent water quality standards and the project remains vital to safeguarding the regional groundwater supply.

3.5 IMPORTED WATER PURCHASES & GROUNDWATER SUPPLY

CBMWD only purchases water from MWD and delivers it to its member agencies. It does not have groundwater rights and does not produce groundwater, capture surface water, or produce recycled water. MWD offers a variety of imported water supplies to its member agencies. Depending on the ultimate use, CBMWD has delivered Non-Interruptible Water (treated full service), Seasonal Treated Replenishment Water, and Seasonal Untreated Replenishment Water. Non-Interruptible Water is the treated firm supply that is available

all year. It is used as the main supplemental supply for cities and water agencies.

Seasonal Storage Long Term, also known as “In-Lieu” water, is MWD supplied water bought to replace water that would otherwise be pumped from groundwater basins. This program incentivizes customer agencies to take surplus imported water which indirectly replenishes the Central Groundwater Basin. This surplus water is purchased at a discount rate in exchange for leaving groundwater in the Central Groundwater Basin for no less than one year so that it can be used subsequently during dry years.

Seasonal Spreading, better known as replenishment water, is delivered to the San Gabriel River and Rio Hondo Spreading Grounds in the Montebello Forebay. Replenishment water does not require treatment and is generally provided during the wet season months (October through April), which allows for it to be purchased at a discounted rate. WRD purchases imported replenishment water from CBMWD to replenish the Central Groundwater Basin. MWD’s replenishment program has been discontinued and WRD purchases replenishment water under Tier 1 Untreated rates.

Table 3.2 reflects CBMWD current imports from MWD and deliveries to their retail members, as well as groundwater demands from CBMWD’s retail members. CBMWD, as a wholesaler, only sells imported water and recycled water. It does not supply groundwater. Groundwater is sold by each individual retail agency to its customers.

Table 3.2: CBMWD Supplies (AF) (DWR Table 6-8 Wholesale)

Water Supply	Additional Detail on Water Supply	2020	
		Actual Volume	Water Quality
Purchased or Imported Water	Retail Agencies	16,441	Drinking Water
Purchased or Imported Water	WRD	0	Raw Water
Other	GW Production	165,619	Drinking Water
Recycled Water	Municipal, Industrial, and Agricultural Use	4,491	Recycled Water
Other	GW Recharge /Montebello Forebay	53,988	Recycled Water
Total		242,765	

3.6 SUPPLY OUTLOOK

3.6.1 MWD'S (AND SUBSEQUENTLY CBMWD'S) SUPPLY OUTLOOK

COLORADO RIVER SUPPLIES

Water supply from the CRA continues to be a critical issue for Southern California as MWD competes with several agricultural water agencies in California for unused water rights to the Colorado River. Although California has an established allocation of 4.4 MAF per year, MWD's allotment stands at 550,000 AFY with additional amounts increasing MWD's allotment to 842,000 AFY if there is any unused water from the agricultural agencies.

MWD recognizes competition from outside states and other agencies within California has decreased the CRA's supply reliability. In 2003, the Quantification Settlement Agreement (QSA) facilitated the transfer of water from agricultural agencies to urban water uses. This historic agreement provides the means to implement transfers and supply programs that will allow California to live within the state's 4.4 MAF basic annual apportionment of Colorado River water.

MWD's Colorado River Allocation continues to be a critical issue.

Lake Mead, located on the Colorado River, is the largest reservoir in the United States. In 2015, it reached its lowest level since the 1930s when the reservoir first filled. As of March 18, 2021, the water level in Lake Mead measured 1,085.7 feet above mean sea level, which is 39 percent of capacity and only 11 feet above the level (1,075 feet) that would trigger a first-ever shortage declaration on the Colorado River.

STATE WATER PROJECT SUPPLIES

The reliability of the SWP affects the MWD member agencies' ability to plan for future growth and supply. DWR develops and releases The State Water Project Delivery Capability Report (DCR) where it provides updates and supply estimations on the SWP delivery capabilities. The latest edition of the report (2019 DCR) incorporates current regulatory requirements for the SWP, and utilizes climate change models from CalSim-II to project supply impacts and estimations.

On an annual basis, each of the 29 SWP contractors, including MWD, request an amount of SWP water based on their anticipated yearly demand. In most cases, MWD's requested

supply is equivalent to its full Table A amount. After receiving the requests, DWR assesses the amount of water supply available based on precipitation, snow pack on Northern California watersheds, volume of water in storage, projected carry over storage, and Sacramento-San Joaquin Bay Delta regulatory requirements. For example, according to the 2019 DCR, the total SWP annual delivery of water to contractors ranged from 2009 to 2018 as shown in **Figure 3.16**. Due to the uncertainty in water supply, contractors are not typically guaranteed their full Table A amount, but instead a percentage of that amount based on available supply.

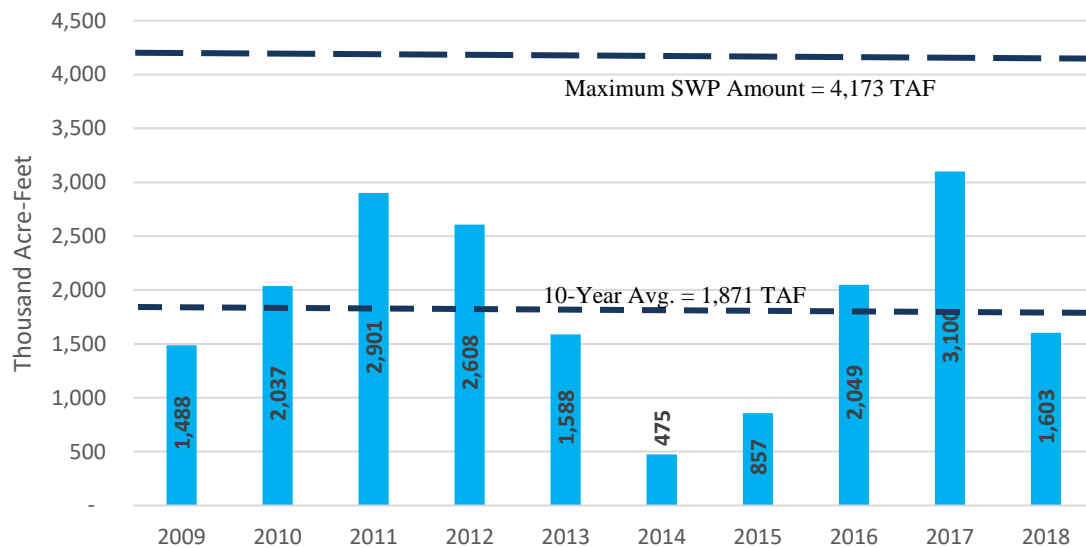


Figure 3.16: SWP Table A Deliveries (2009 - 2018)

Each December, DWR provides the contractors with their first estimate of allocation for the following year. As conditions develop throughout the year, DWR revises the allocations. Currently, the total contractor requested allocation for Table A water is 4.2 MAF. MWD initially requested 1.9 MAF, which is 45 percent of the total contractors' requests for Table A water. Due to the variability in supply for any given year, it is important to understand the reliability of the SWP to supply a specific amount of water each year to the contractors.

With the state undergoing a second consecutive dry year, DWR has already taken the steps to prolong the SWP supplies. On March 2021, DWR decreased the allocation of 2021 SWP deliveries for the contractors from 422,848 AF to 210,266 AF. Based on the recent low amount of precipitation and runoff, and an assessment of overall water supply conditions, SWP supplies are projected to be 5 percent of most SWP contractor's 2021 requested Table A Amounts. This reduction decreased MWD's initial request from 1,911,500 AF to 95,575 AF.

STORAGE

Statewide, storage reservoir levels rise and fall due to seasonal climate changes, which induce increase in demand. During periods of drought, reservoir levels typically drop significantly and may limit the amount of supplies available. As a result, both DWR and MWD monitor reservoir levels regularly. **Figure 3.17** shows the statewide reservoir levels the recent drought period (2012-2015) and compares it with current levels (February 2021). **Figure 3.18** shows the MWD reservoir levels. As shown, the majority of the State of California's reservoirs were all at below average levels, and to this day, the state is still in a recovery stage from the recent droughts.

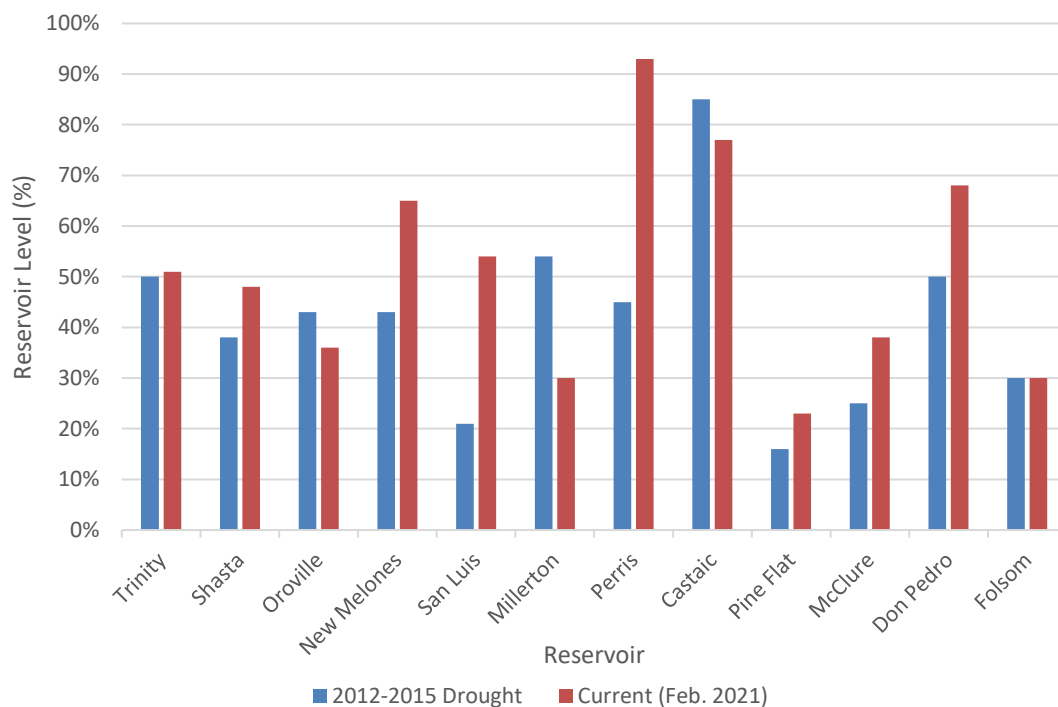


Figure 3.17: Reservoir Level Comparison from Recent Drought and Current

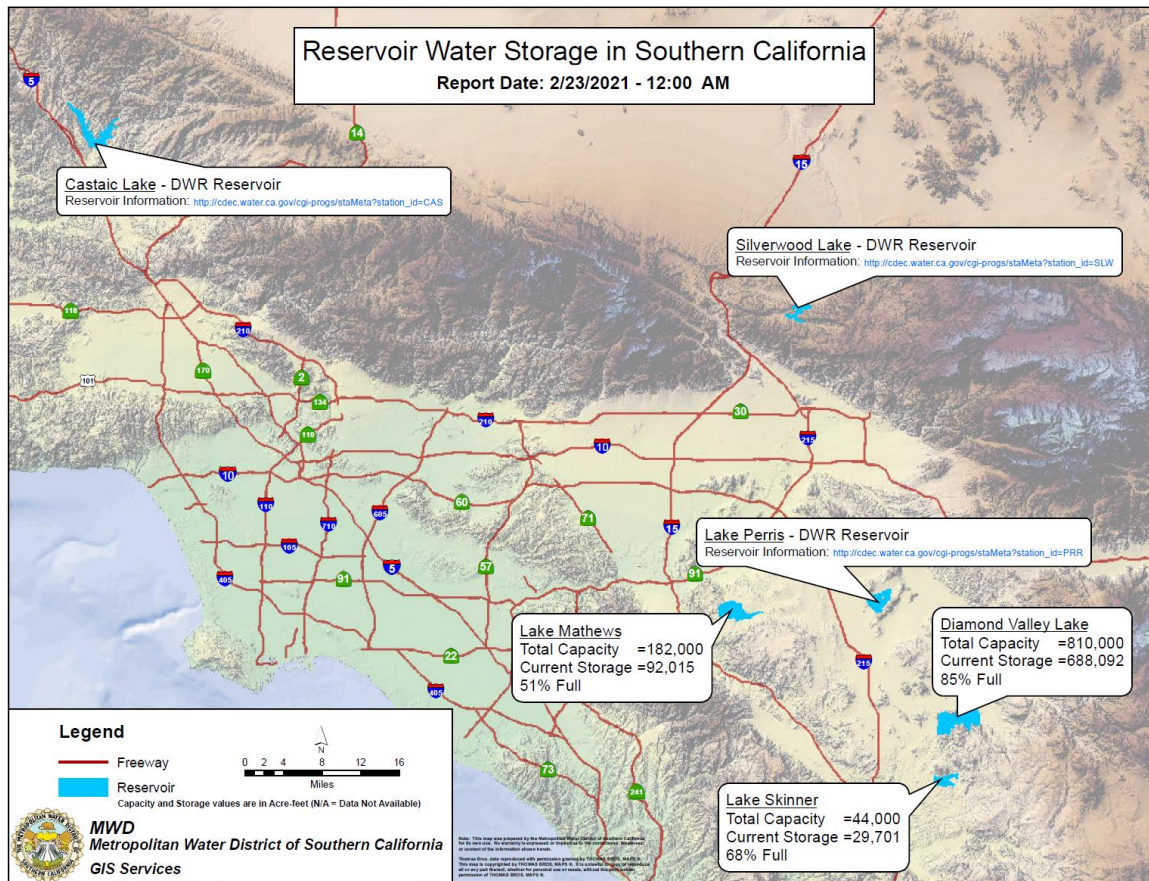


Figure 3.18: MWD Reservoir Levels (Feb. 2021)

3.6.2 MWD'S DETAILED SUPPLY OUTLOOK

MWD evaluated supply reliability by projecting supply and demand conditions for the single and multi-year drought cases based on conditions affecting the SWP (MWD's largest and most variable supply). For this supply source, the single driest-year was 1977, and the three-year dry period was 1990-1992. MWD's analysis illustrated in **Tables 3.3** and **3.4**, correspond to MWD's 2020 UWMP Tables 2-1, 2-2, 2-3, 2-4, 2-5, and 2-6. These tables demonstrate that the region can provide reliable water supplies not only under normal conditions but also under both the single driest year and the multiple dry year hydrologies.

**Table 3.3: MWD Regional Imported Water Supply Reliability Projections
Average and Single Dry Years (AF) for 2025 to 2045**

	Row	Region Wide Projections	2025	2030	2035	2040	2045
Supply	A	Projected Supply: Average Year	3,932,000	3,962,000	3,960,000	3,598,000	3,622,000
	B	Projected Supply: Dry Year	2,727,000	2,791,000	2,789,000	2,551,000	2,572,000
	C = B/A	Projected Dry Yr. / Avg. Yr. Supply (%)	69.4%	70.3%	70.4%	70.9%	71.0%
Demand	D	Projected Average Year Demand	1,274,000	1,256,000	1,273,000	1,294,000	1,319,000
	E	Projected Dry Year Demand	1,402,000	1,387,000	1,408,000	1,431,000	1,457,000
	F=E/D	Projected Dry Year / Avg. Year (%)	110.0%	110.4%	110.6%	110.6%	110.5%
Surplus	G = A-D	Projected Surplus: Average Year	2,658,000	2,706,000	2,687,000	2,304,000	2,303,000
	H = B-E	Projected Surplus: Dry Year	1,325,000	1,404,000	1,381,000	1,120,000	1,115,000
Programs Under Dev.	I	Projected Capability of Programs (Average Year)	47,000	113,000	13,000	372,000	347,000
	J	Projected Capability of Programs (Dry Year)	0	0	0	0	0
Potential Surplus	K=A+I-D	Projected Surplus: Average Year	5,253,000	5,331,000	5,246,000	5,264,000	5,288,000
	L=B+J-E	Projected Surplus: Dry Year	4,129,000	4,178,000	4,197,000	3,982,000	4,029,000
Comparison	I = A/D	Projected Avg. Yr. Supply/Demand (%)	308.6%	315.4%	311.1%	278.1%	274.6%
	J = A/E	Projected Dry Yr. Supply/Demand (%)	280.5%	285.7%	281.3%	251.4%	248.6%

**Table 3.4: MWD Regional Imported Water Supply Reliability Projections
Average and Multiple Dry Years (AF) 2025 to 2045**

	Row	Region Wide Projections	2025	2030	2035	2040	2045
Supply	A	Projected Supply: Average Year	3,932,000	3,962,000	3,960,000	3,598,000	3,622,000
	B	Projected Supply: Multiple Dry Year	2,198,000	2,210,000	2,209,000	1,973,000	1,995,000
	C = B/A	Projected Dry Yr. / Avg. Yr. Supply (%)	55.9%	55.8%	55.8%	54.8%	55.1%
Demand	D	Projected Average Year Demand	1,274,000	1,256,000	1,273,000	1,294,000	1,319,000
	E	Projected Dry Year Demand	1,412,000	1,414,000	1,435,000	1,457,000	1,484,000
	F=E/D	Projected Dry Year / Avg. Year (%)	110.8%	112.6%	112.7%	112.6%	112.5%
Surplus	G = A-D	Projected Surplus: Average Year	2,658,000	2,706,000	2,687,000	2,304,000	2,303,000
	H = B-E	Projected Surplus: Multiple Dry Year	786,000	796,000	774,000	516,000	511,000
Programs Under Dev.	I	Projected Capability of Programs (Average Year)	47,000	113,000	13,000	372,000	347,000
	J	Projected Capability of Programs (Multiple Dry Year)	10,000	0	0	235,000	213,000
Potential Surplus	K=A+I-D	Projected Surplus: Average Year	5,253,000	5,331,000	5,246,000	5,264,000	5,288,000
	L=B+J-E	Projected Surplus: Multiple Dry Year	4,129,000	4,178,000	4,197,000	3,982,000	4,029,000
Comparison	I = A/D	Projected Avg. Yr. Supply/Demand (%)	308.6%	315.4%	311.1%	278.1%	274.6%
	J = A/E	Projected Dry Yr. Supply/Demand (%)	278.5%	280.2%	276.0%	246.9%	244.1%

3.6.3 CBMWD'S IMPORTED WATER SUPPLY PROJECTIONS

MWD is CBMWD's sole wholesale supplier of water. **Table 3.5** reflects MWD's average year supplies in five-year increments starting with 2025 and ending in 2045. The bottom section shows supplies under development by MWD and potential surplus supplies. It also shows average year demands in five-year increments starting with 2025 and ending in 2045.

Table 3.5: Projected Water Supply to Member Agencies (AF) (DWR Table 6-9 Wholesale)

Water Supply	Additional Description	Projected Water Use (Reasonably Available Volume)				
		2025	2030	2035	2040	2045
Purchased or Imported Water	MWD	71,770	71,770	71,770	71,770	71,770
Other	GW Production	174,925	179,298	183,685	187,340	189,183
Recycled Water	Municipal, Industrial, and Agricultural Use	6,759	6,928	7,101	7,279	7,461
Other	GW Recharge / Montebello Forebay	54,579	55,944	57,342	58,776	60,245
TOTAL		308,033	313,940	319,898	324,165	328,659

3.7 OTHER SOURCES OF WATER IN CBMWD'S SERVICE AREA

3.7.1 GROUNDWATER

CBMWD, as a wholesale agency, neither pumps nor projects itself to pump groundwater for future use. Groundwater has for many years been the primary supply of water within CBMWD's service area. The Central Groundwater Basin is predominately comprised of a confined, pressurized aquifer system, with two large unconfined merged aquifer forebays, the Montebello Forebay and the Los Angeles Forebay. Twelve aquifers underlie the Central Groundwater Basin.

The Montebello Forebay in the northeast corner of the basin straddles the San Gabriel River and the Rio Hondo (a tributary of the Los Angeles River) at the point where they emit from the Whittier Narrows. The Montebello Forebay lies directly downstream of the San Gabriel Valley.

The Los Angeles Forebay straddles the Los Angeles River. Due to the concrete lining of the Los Angeles River and the lack of spreading facilities, only minor amounts of water are recharged into the Central Groundwater Basin through the Los Angeles River system.

The Central Groundwater Basin is adjudicated and based upon Watermaster services under two Court Judgements: The Third Amended Central Basin Judgement, managed by the Central Basin Water Rights.

3.7.2 RECYCLED WATER

The recycled water distribution system includes over 80 miles of purple pipeline and four pump stations. The pump stations include the Rio Hondo Pump Station, Hollydale Pump Station, Cerritos Pump Station owned by the City of Cerritos, and Cudahy Pump Station.

Central Basin obtains recycled water from the San Jose Creek Water Reclamation Plant in Whittier and the Los Coyotes Water Reclamation Plant in Cerritos. Owned and operated by the Sanitation Districts of Los Angeles County, these two reclamation plants produce effluent that meets the most stringent requirements for water recycling and recycled water reuse.

Recycled water is widely accepted as a water supply source throughout CBMWD's service area. It is used to augment local supplies and reduce dependence on imported water. Recycled water supplies demands for non-potable applications such as landscape irrigation and commercial and industrial processes. A more detailed description of this study is in **Section 6**.

3.8 SUPPLY RELIABILITY

3.8.1 OVERVIEW

It is required that every urban water supplier assess the reliability to provide water service to its customers under normal, dry, and multiple dry water years. CBMWD depends on a combination of imported supplies and its retail agencies local supplies to meet water demands in its service area.

3.8.2 IMPORTED WATER RELIABILITY (CBMWD TOTAL POTABLE SUPPLY)

MWD participates in the development of groundwater, groundwater recovery, recycled water systems, desalination opportunities, and collection of urban return flows to augment the reliability of the imported water system. There are various factors that may impact reliability of supplies, such as legal, environmental, water quality, and climatic, which are discussed below. MWD

MWD's 2020 UWMP anticipates supplies meeting demand for all climatic conditions through 2045.

projects water supplies to meet full-service demands; MWD's 2020 UWMP finds that MWD is able to meet with existing supplies all full service demands of its member agencies starting in 2025 through 2045 during normal years, single dry year, and multiple dry years.

MWD's 2015 Integrated Water Resources Plan (IRP) update describes the core resource strategy used to meet full-service retail demands under all foreseeable hydrologic conditions from 2020 through 2040. The foundation of MWD's resource strategy for achieving regional water supply reliability consists of developing and implementing water resources programs and activities through its IRP preferred resource mix. This preferred resource mix includes conservation, local resources, such as water recycling and groundwater recovery, Colorado River supplies and transfers, SWP supplies and transfers, in-region surface reservoir storage, in-region groundwater storage, out-of-region banking, treatment, conveyance and infrastructure improvements. CBMWD is reliant on MWD for all of its imported water. With the addition of planned supplies under development, MWD's 2020 UWMP finds that MWD will be able to meet full-service demands from 2025 through 2045, even under a repeat of the worst drought. **Table 3.6** shows the reliability of the MWD's supply for single dry year and multiple dry year scenarios. MWD's single dry year is based on the drought in 1977. MWD's five-consecutive dry years is based on from 1988 to 1992, which represents as the driest five-consecutive year historic sequence for MWD's water supply. In addition to meeting full-service demands from 2025 through 2045, MWD projects reserve and replenishment supplies to refill system storage. CBMWD's supply reliability for base average, single-dry, and multiple-dry years are identical to that of MWD's.

**Table 3.6: MWD Supply Reliability
Single & Multiple Dry Years**

		Base Year	Percent Available
Average Year		1922 - 2017	100%
Single Dry Year		1977	100%
Multiple Dry Years	Year 1	1988	100%
	Year 2	1989	100%
	Year 3	1990	100%
	Year 4	1991	100%
	Year 5	1992	100%

3.8.3 FACTORS IMPACTING RELIABILITY

The UWMP Act requires a description of the reliability of the water supply and vulnerability to seasonal or climatic shortage. The following are some of the factors identified by MWD that may have an impact on the reliability of MWD supplies.

Environment – Endangered species protection needs in the Sacramento-San Joaquin River Delta result in operational constraints to the SWP system. The Bay-Delta's declining ecosystem caused by agricultural runoff, operation of water pumps and other factors led to

historical restrictions in SWP supply deliveries. SWP and CVP delivery restrictions due to the biological opinions have reduced SWP and CVP supplies by approximately 5.2 MAF since in 2008.

Legal – Listings of additional species under the Endangered Species Act and new regulatory requirements could further impact SWP operations by requiring additional export reductions, releases of additional water from storage, or other operational changes impacting water supply operations. Additionally, any challenges to the QSA in the court systems may have impacts on the Imperial Irrigation District and San Diego County Water Authority transfer. If there are negative impacts, San Diego could become more dependent on the MWD supplies. One such challenge was settled in 2013 upholding the validity of the QSA.

Water Quality – Water imported from the CRA contains a high level of salts. The operational constraint is that this water needs blending with SWP supplies to meet the target salinity of 500 mg/L of TDS. Another water quality concern relates to the quagga mussel. Controlling the spread and impacts of quagga mussels within the CRA requires extensive maintenance and results in reduced operational flexibility.

Climate Change – Changing climate patterns may shift precipitation patterns and affect water supply. Unpredictable weather patterns make water supply planning even more challenging. The areas of concern for California include the reduction in Sierra Nevada snowpack, increased intensity and frequency of extreme weather events, and rising sea levels causing increased risk of levee failure.

Legal, environmental, and water quality issues may impact MWD supplies. It is felt, however, that climatic factors would have more of an impact. Climatic conditions have been projected based on historical patterns; however, severe pattern changes may occur in the future. **Table 3.7** shows the factors that may affect inconsistency of supply.

Table 3.7: Factors That May Affect Inconsistency of Supply

Name of Supply	Legal	Environmental	Water Quality	Climate
State Water Project	✓	✓	✓	✓
Colorado River			✓	✓

MWD's 2020 UWMP addresses these factors in more detail.

3.8.4 NORMAL-YEAR RELIABILITY COMPARISON

CBMWD has no entitlements and/or written contracts to receive imported water from MWD via the regional distribution system. The relationship between MWD and all of its member agencies is through MWD's Act and Administrative Code. Although connection capacity rights do not guarantee the availability of water, per se, they do provide the ability to convey water when it is available from the MWD distribution system. CBMWD requests a certain amount of water, which is then delivered by MWD. MWD's operators work with CBMWD's operators on the timing of the deliveries. The amount can vary from day-to-day, year-to-year based on what the demands are from CBMWD's retail agencies. Weather, local supplies, the economy, population growth in the service area, and other variables, can impact those demands.

All imported water supplies assumed in this section are available to CBMWD from existing water transmission facilities. **Table 3.8** shows supply and demand under normal year conditions. More water supplies are to be available from MWD; however, the table below does not show this since CBMWD would not take supplies more than demands.

Table 3.8: Projected Normal Water Supply & Demand (AF) (DWR Table 7-2 Wholesale)

	2025	2030	2035	2040	2045
Supply totals	308,033	313,940	319,898	325,165	328,659
Demand totals	260,234	260,942	262,197	263,096	264,664
Difference	47,799	52,998	57,701	62,069	63,995

3.8.5 SINGLE DRY-YEAR RELIABILITY COMPARISON

CBMWD documented that its supplies are 100 percent reliable for single dry year demands from 2025 through 2045 with an average demand increase of 108 percent of normal. The average is based on the single dry year demand increases from CBMWD's member agencies. **Table 3.9** compiles supply and demand projections for a single dry water year. The available imported supply is greater than shown; however, the surplus is not included because of the ability of MWD to meet demands.

Table 3.9: Projected Single-Dry Year Water Supply & Demand (AF) (DWR Table 7-3 Wholesale)

	2025	2030	2035	2040	2045
Supply totals	308,033	313,940	319,898	325,165	328,659
Demand totals	261,446	262,156	263,412	264,312	265,881
Difference	46,587	51,784	56,486	60,853	62,778

3.8.6 MULTIPLE DRY-YEAR RELIABILITY COMPARISON

CBMWD is capable of providing customers sufficient water to meet all their demands with significant reserves in multiple dry years from 2025 through 2045. To project demands during multiple drought periods, the recent drought years from 2011 to 2015 will be used as the basis for the multiple dry years. Each of CBMWD's member agencies details outlines their demand and supply analysis through multiple dry years in their respective UWMPs.

These percentages are based on a recent multiple dry-year scenario and is true even if the demand projections were to be increased by a large margin. **Table 3.10** shows supply and demand projections under multiple dry year conditions.

Table 3.10: Project Multiple Dry-Year Period Supply & Demand (AFY) (DWR Table 7-4 Wholesale)

		2020	2025	2030	2035	2040
First year	Supply totals	308,033	313,940	319,898	325,165	328,659
	Demand totals	256,250	262,705	263,736	264,774	266,072
	Difference	51,783	51,235	56,162	60,391	62,587
Second year	Supply totals	308,033	313,940	319,898	325,165	328,659
	Demand totals	256,250	262,705	263,736	264,774	266,072
	Difference	51,783	51,235	56,162	60,391	62,587
Third year	Supply totals	308,033	313,940	319,898	325,165	328,659
	Demand totals	256,250	262,705	263,736	264,774	266,072
	Difference	51,783	51,235	56,162	60,391	62,587
Fourth year	Supply totals	308,033	313,940	319,898	325,165	328,659
	Demand totals	256,250	262,705	263,736	264,774	266,072
	Difference	51,783	51,235	56,162	60,391	62,587
Fifth year	Supply totals	308,033	313,940	319,898	325,165	328,659
	Demand totals	256,250	262,705	263,736	264,774	266,072
	Difference	51,783	51,235	56,162	60,391	62,587

3.9 REDUCED DELTA RELIANCE REPORTING

3.9.1 INTRODUCTION

An urban water supplier that anticipates participating in or receiving water supply benefits from a proposed project (“covered action”) such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Delta, should provide information in their 2015 and 2020 UWMPs that can then be used in the covered action process to



Figure 3.19: Bay-Delta’s Fragile Ecosystem

demonstrate consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (California Code Reg., tit. 23, § 5003). A “covered action” is an activity that may cause either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment, directly undertaken by any public agency that will occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh.

3.9.2 INFEASIBILITY OF ACCOUNTING SUPPLIES FROM THE DELTA WATERSHED FOR MWD’S MEMBER AGENCIES AND THEIR CUSTOMERS

MWD’s service area, as a whole, reduces reliance on the Delta through investments in non-Delta water supplies, local water supplies, and regional and local demand management measures. MWD’s member agencies coordinate reliance on the Delta through their membership in MWD, a regional cooperative providing wholesale water service to its 26 member agencies. Accordingly, regional reliance on the Delta can only be measured regionally, not by individual MWD member agencies and not by the customers of those member agencies.

MWD’s member agencies, and those agencies’ customers, indirectly reduce reliance on the Delta through their collective efforts as a cooperative. MWD’s member agencies do not control the amount of Delta water they receive from MWD. MWD manages a statewide integrated conveyance system consisting of its participation in the SWP, its CRA including Colorado River water resources, programs and water exchanges, and its regional storage portfolio. Along with the SWP, CRA, storage programs, and MWD’s conveyance and

distribution facilities, demand management programs increase the future reliability of water resources for the region. In addition, demand management programs provide system-wide benefits by decreasing the demand for imported water, which helps to decrease the burden on the MWD's infrastructure and reduce system costs, and free up conveyance capacity to the benefit of all member agencies.

MWD's costs are funded almost entirely from its service area, with the exception of grants and other assistance from government programs. Most of MWD's revenues are collected directly from its member agencies. Properties within MWD's service area pay a property tax that currently provides approximately 8 percent of the fiscal year 2021 annual budgeted revenues. The rest of MWD's costs are funded through rates and charges paid by MWD's member agencies for the wholesale services it provides to them. Thus, MWD's member agencies fund nearly all operations MWD undertakes to reduce reliance on the Delta, including Colorado River Programs, storage facilities, Local Resources Programs and Conservation Programs within MWD's service area.

Because of the integrated nature of MWD's systems and operations, and the collective nature of MWD's regional efforts, it is infeasible to quantify each of MWD member agencies' individual reliance on the Delta. It is infeasible to attempt to segregate an entity and a system that were designed to work as an integrated regional cooperative.

In addition to the member agencies funding MWD's regional efforts, they also invest in their own local programs to reduce their reliance on any imported water. Moreover, the customers of those member agencies may also invest in their own local programs to reduce water demand. However, to the extent those efforts result in reduction of demands on MWD, that reduction does not equate to a like reduction of reliance on the Delta. Demands on MWD are not commensurate with demands on the Delta because most of MWD member agencies receive blended resources from MWD as determined by MWD, not the individual member agency. For most member agencies, the blend varies from month-to-month and year-to-year due to hydrology, operational constraints, use of storage, and other factors.

3.10 ENERGY INTENSITY

3.10.1 OVERVIEW

New to the 2020 UWMP, it is required that every urban water supplier assess the energy required to distribute their water supply to their consumers or member agencies. The water supplier's energy intensity is required for the preparation of an UWMP, as defined in CWC

Section 10631.2(a). Energy intensity varies with climate, topography, source characteristics, proximity, and other factors. Therefore, urban water suppliers face issues related to the economic costs of the energy required for their operations, as well as issues related to the sustainable supply of energy and water. Knowing how much energy is needed to deliver water to customers is important because of its significance for the state's total energy demands and for its implications regarding greenhouse gas (GHG) emissions and climate goals for the region and state.

This Section includes an assessment of the energy intensity of the water supply operation for CBMWD. Energy is required for the pumping, conveyance, treatment and distribution of water, and for collection, treatment, and discharge of wastewater, and/or conveyance and distribution of recycled water.

Energy intensity in respect to water supplies is a measure of unit energy consumption an urban water supplier expends per AF to convey water from the point where the supplier acquires the water to the point of delivery. Energy for public water and wastewater services are measured in kilowatt-hours (kWh) of electricity, which is then normalized by water volume to express energy intensity in kilowatt-hour per acre-feet (kWh/AF).

Some of the main differences between energy use associated with various water supply sources are the distances the water must be transported from its origins (the amount of pumping necessary to harvest and distribute the water) and the location of treatment facilities in relation to the end users, among others.

3.10.2 WATER USE AND ENERGY RELATIONSHIP

Energy production can emit a number of different types of Greenhouses Gas (GHGs). California's Air Resources Board recognizes that energy production accounts for between 30 and 40 percent of total GHG production in California, and include the following inventory of GHGs: Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF₃). These GHGs vary in magnitude in terms of their GHG strength, and therefore are converted to be equivalent to CO₂ for the purposes of measuring GHG emission across the state. CO₂ emissions (or the equivalent for other GHGs) are the common measurement for GHG emissions. Currently, statewide water uses accounts for nearly 20 percent of electricity use, and 30 percent of non-power plant related natural gas consumption. Water use and energy are linked in at least three critical ways:

- Water pumping and purification: The amount of energy used to pump water will

depend upon the source (e.g., surface versus groundwater), the distance and height the water must be moved, and treatment requirements.

- *Wastewater treatment*: The amount of energy used in wastewater treatment plant typically ranges from 1,100 to 4,600 kWh per million gallons of wastewater treated.
- *Water heating*: In an average California home, 41 percent of the water is used for dishwashing, faucets, laundry, and bathing water that is often heated.

These amounts, in total, are so significant that one must also count the amount of GHGs from the fossil fuels that are burned to produce the oil, gas, coal and other combustibles that are then burned to produce the electricity. CBMWD understand the water-energy nexus and aims to conserving water saves the energy that would have been used to convey, treat, and distribute the water. Reducing the energy consumption in water operations leads to the decreased production of GHGs.

3.10.3 ENERGY USAGE AND INTENSITY

In order to determine energy use related to water supply processes under CBMWD's operational control, CBMWD collected billing and energy quantity data provided by Southern California Edison (SCE) from FY18 – 19 (July 1, 2018 to June 30, 2019) representing the comprehensive one-year reporting period. The billing amounts for each facility were converted to an energy use quantity measured in kilowatt hours (kWh) for electricity. **Table 3.11** summarizes the monthly energy usages for CBMWD. The Rio Hondo Pumping Station and Hollydale Pumping Station delivers water to all of CBMWD's recycled water customers. CBMWD does not own or operate any potable water distribution mains or treatment facilities.

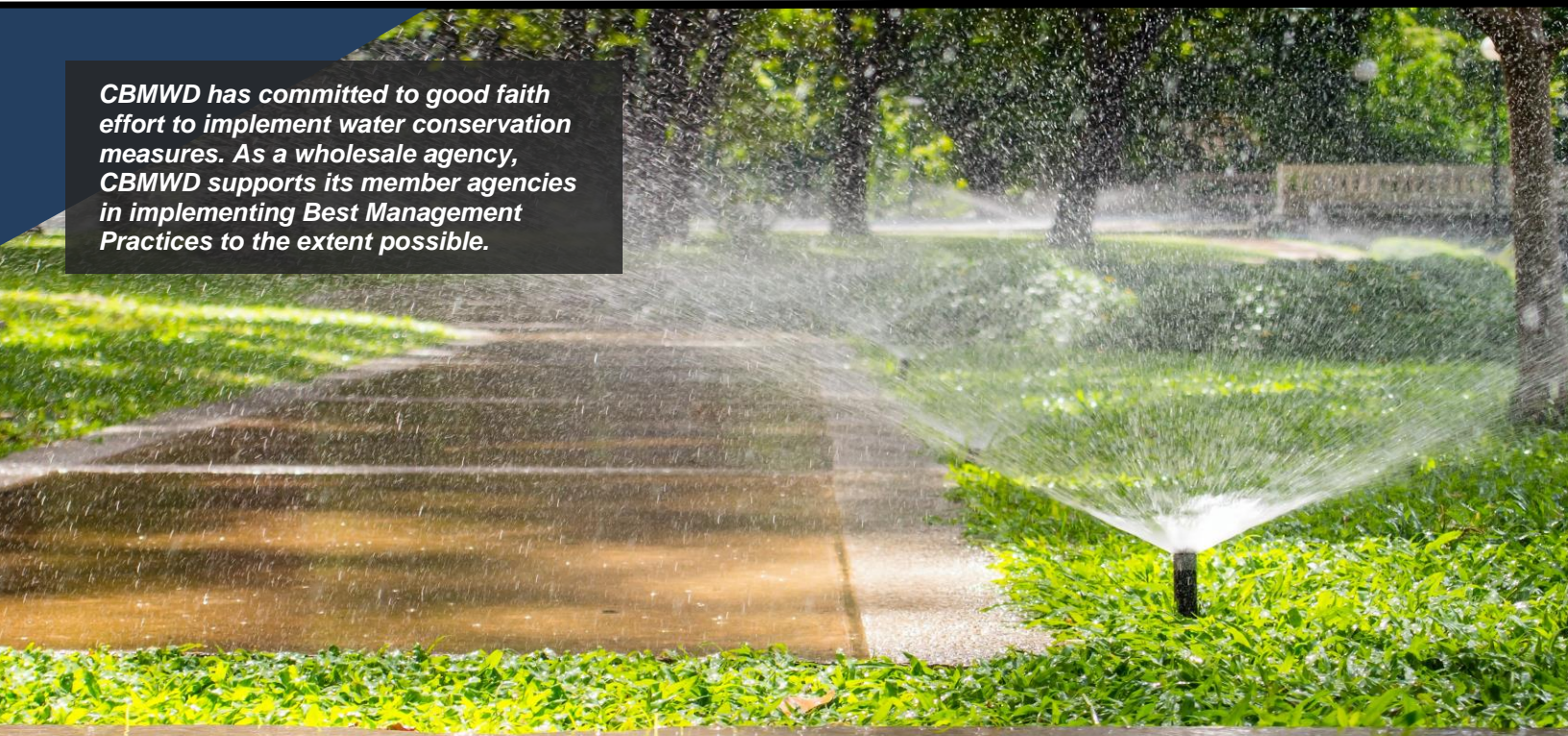
Table 3.12 summarizes the energy intensity for CBMWD. As can be seen for FY18-19, over 2.1 million kWh of energy was used to deliver over 4,200 AF of recycled water. This equates to an energy intensity of 500.0 kWh/AF. DWR requires the reporting of energy intensity as kWh per million gallons (kWh/MG). Therefore, FMWD's energy intensity is 1,534.5 kWh/MG.

Table 3.11: FY18-19 Energy Usage

Month/Year	Energy Usage		
	Hollydale PS	Rio Hondo PS	Totals
July 2018	14,752	227,167	241,919
August 2018	15,000	214,030	229,030
September 2018	13,038	209,153	222,191
October 2018	12,206	173,374	185,580
November 2018	8,487	154,582	163,069
December 2018	10,920	131,720	142,640
January 2019	11,639	122,581	134,220
February 2019	10,163	109,121	119,284
March 2019	10,547	124,018	134,565
April 2019	9,914	168,300	178,214
May 2019	9,766	173,492	183,258
June 2019	12,452	187,109	199,561
Totals	138,884	1,994,647	2,133,531

Table 3.12: CBMWD Total Energy Intensity (DWR Table O1-B)

Enter Start Date for Reporting Period	7/1/2018	Urban Water Supplier Operational Control		
	End Date 6/30/2019			
<input type="checkbox"/> Is upstream embedded in the values reported?		Sum of All Water Management Processes	Non-Consequential Hydropower	
Water Volume Units Used	AF	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (volume unit)		4267		4267
Energy Consumed (kWh)		2133531		2133531
Energy Intensity (kWh/vol. converted to MG)		1534.5	#DIV/0!	1534.5



CBMWD has committed to good faith effort to implement water conservation measures. As a wholesale agency, CBMWD supports its member agencies in implementing Best Management Practices to the extent possible.

SECTION 4: CONSERVATION MEASURES

CENTRAL BASIN MUNICIPAL WATER DISTRICT | 2020 URBAN WATER MANAGEMENT PLAN



SECTION 4 CONSERVATION MEASURES

4.1 OVERVIEW

As a result of diminished supplies and difficulty in developing new supplies, water conservation plays an important role in Southern California's sustainability. In Water Year 2018-2019, Governor Brown signed SB 606 and AB 1668 into law. The legislation required DWR, the State Water Resources Control Board, and three other state agencies to develop a long-term water conservation framework to *"make conservation a California way of life."* In order to conform to the Water Action Plan, including meeting the SBx7-7 target (20 percent by 2020), many water agencies had to re-examine traditional conservation programs. Agencies statewide acknowledge that efficient water use is the foundation of its current and future water planning and operations policies.

In March 2018, the California Urban Water Conservation Council (CUWCC) disbanded, and members of the CUWCC worked together to form the California Water Efficiency Partnership (CalWEP). CalWEP's mission is to maximize urban water efficiency and conservation throughout California by supporting and integrating innovative technologies and practices; encouraging effective public policies; advancing research, training, and public education; and building collaborative approaches and partnerships. The CUWCC (now CalWEP) drafted the Memorandum of Understanding Regarding Urban Water Conservation (MOU) in 1991. At that time, the MOU established 14 Best Management Practices (BMPs) which define policies, programs, practices, rules, regulations, or ordinances that result in the more efficient use or conservation of water. Eventually, the original 14 BMPs were diminished to 5 BMPs as shown in **Section 4.1.1**.

This section of the UWMP satisfies the requirements of § 10631 (f) & (j) of the CWC and describes how CBMWD implements each applicable BMP and how CBMWD evaluates the effectiveness of the BMPs. This section also provides an estimate of existing conservation savings where information is available.

4.1.1 CalWEP BMPS

The updated CalWEP BMPs from 2015 will still be in effect for the 2020 UWMP. The BMPs are:

- **BMP 1:** Utility Operations
- **BMP 2:** Public Education & Outreach
- **BMP 3:** Residential Programs
- **BMP 4:** Commercial, Institutional, and Industrial Programs
- **BMP 5:** Landscape Programs

4.2 CBMWD CONSERVATION PROGRAMS

CBMWD recognizes the importance of water conservation and water use efficiency as an integral part of water use planning. CBMWD is a signatory to the CalWEP MOU. As a member of CalWEP, CBMWD commits itself to use good-faith efforts to implement all applicable BMPs and submits annual reports to the CalWEP that document the implementation of each BMP. CBMWD actively implements all recommended measures with good-faith effort by maintaining staff support, funding, and in general, the priority levels necessary to achieve the level of activity called for in each BMP's definition as described in the MOU.

As a CalWEP member limited to only one source of supply, CBMWD understands the need for strong conservation measures.



Figure 4.1: CBMWD Staff Attends Multiple Community Events throughout the Year

CBMWD plays an active role in promoting water use efficiency in its service area. To this end, in 2006, conservation efforts were heightened with the adoption of CBMWD's 5-year Water Conservation Master Plan. The plan evaluated current and future water savings potential and outlined a cost-effective conservation strategy in CBMWD's service area. It has since been updated in 2015 as Board Resolution No. 3-15-860, which is referred to as the Conservation Monitoring Program. Moreover, as the wholesale supplier to the region, CBMWD assists its retail agencies by administering various MWD rebate programs for its retail agencies and providing assistance to the retail agencies in other water use efficiency, education, and public information programs.

4.2.1 BMP 1: UTILITY OPERATIONS

This BMP deals with water waste prohibitions, water efficiency ordinances, metering, conservation pricing, and other items related to managing water use.

WATER WASTE PROHIBITION ORDINANCE AND AMENDMENT

Beginning 2006, CBMWD Board of Directors adopted a 5-year Water Conservation Master Plan, and revised in 2015 (Board Resolution No. 3-15-860), to prevent water waste in its service area. Updates to the District's plan considers elements that adhere to reduced supply conditions in addition to the following areas: fairness based on consumptive use needs, considers actions demonstrated by retail agencies of reducing water demands, applies to all agencies with a connection to MWD's imported water supply, and incorporates recent adjustments adopted under MWD's plan. The retail agencies that CBMWD wholesales water to have established conservation measures for their customers and those measures can be found in their UWMPs.

DROUGHT RESPONSE PLAN

In June 2015, CBMWD developed a Drought Response Plan along with a Drought Response Tool in order to assist retail agencies with responding to the SWRCB regulations and conservation mandates. The Drought Response Tool assists retail agencies with evaluating baseline water use by sector, identifying customer sectors and major end uses to target for water savings, evaluating drought response actions and associated water savings potential and tracking progress against water conservation standards mandated by the SWRCB.

With the mandated water use reductions implemented by the State Water Resources Control Board, CBMWD sought to provide additional resources to its retail water agencies to assist them in meeting their specific targets. These efforts included providing drought

training for its retail water agencies, where CBMWD staff educated retail water agency staff on conservation rebates available and how to respond to constituent inquiries regarding the drought. CBMWD also developed a drought training manual that was provided to each participant as a resource to have the most up to date information on current conditions. CBMWD prepared a comprehensive Drought Response Plan and Tool for agencies to identify water use and evaluate drought response programs.

METERING

Metering is not applicable to wholesalers; however, all water deliveries by CBMWD are metered and utilize standard commodity rate components based on rates and charges schedules developed by CBMWD. All water deliveries by retail agencies are metered to the end user.

CONSERVATION PRICING

Although the conservation pricing BMP refers to the rate structure of a retail water agency to encourage a reduction of water use, CBMWD, as a wholesale agency, employs a water budget structure for its retail agencies based on a two tier rate structure.

Retail agencies that exclusively provide groundwater to their customers, tend to have water rates that are lower than those that serve a mix of groundwater and imported water. Imported water purchased from CBMWD and provided by MWD carries not only the cost of acquiring importing, purifying (treating), and distributing the commodity throughout the region but also a long-term action plan for ensuring adequate supplies to meet growing demands through conservation, education, and new locally produced supplies.

CBMWD's Capacity Charge is intended to encourage customers to reduce peak day demands during the summer months, which will result in more efficient use of MWD's existing infrastructure. CBMWD has passed through this MWD charge to its customer agencies by applying MWD's methodology. Each customer's Capacity Charge is determined from their highest daily average usage (per cfs) for the past three completed summer periods of May 1 through September 30; however, because MWD assesses CBMWD on the coincident daily peak of all the connections and aggregate of all its customers' daily peak as the non-coincident peak, CBMWD is able to keep the Capacity Charge rate lower than the MWD rate for its customers.

4.2.2 BMP 2: PUBLIC EDUCATION & OUTREACH

This BMP deals with outreach efforts including emails, newsletters, advertisements, presentations, promotions, etc., related to outreach and education.

SCHOOL PROGRAMS

Think Earth! It's Magic (Grades K-5)

A collaborative program between CBMWD and the Think Earth Environmental Education Foundation to stage free, environmental magic shows for elementary schools. Each year, this traveling magic show visits schools throughout the region to teach students about the importance of applying environmentally friendly practices around their homes and schools. This program is the only program in the state to combine an award-winning, grade-appropriate classroom curriculum with an environmental magic show assembly.

Think Water! It's Magic (Afterschool Program for Grades K-5)

An adaptation of CBMWD's popular Think Earth! It's Magic program, Think Water! Its Magic brings the educational environmental magic shows to extended day care and after school programs throughout the service area. The magic shows cover such topics as the water cycle, water quality, water recycling, and the importance of conservation.

Think Watershed (Grades 4-6)

Think Watershed is a partnership of environmental stakeholders in southern California interested in creating and implementing a watershed education program for grades 4 to 6 using the Los Angeles County Office of Education's Floating Lab. Components of the program include a classroom watershed curriculum focused on the San Gabriel River Watershed and then a field trip on board the Floating Lab, a modern marine science research vessel docked in Rainbow Harbor, Long Beach.

Water Squad Investigations (Grades 4-12)

Successfully launched in fall 2006, Water Squad Investigations is a collaborative water education program between CBMWD, Los Angeles County Sanitation District (LACSD) and the Los Angeles County Department of Parks and Recreation. Through the program, students go on a one-day field trip to the San Jose Creek WRP and the Whittier Narrows Nature Center. By day's end, students will have gained a greater understanding of how water recycling can help conserve drinking water and simple ways to conserve water around their homes.

Water Wanderings (Grades 4-5)

A classroom visitation program between CBMWD and the S.E.A. Lab in Redondo Beach.

This hands-on program takes fourth and fifth-graders on a 2 1/2 –hour journey through California’s water system. Students participate in activities that include “Touring Tide Pool,” a van outfitted with touch-tanks, enabling students to touch live marine creatures and plants. Water Wanderings meets many of the fourth grade and fifth grade state standards for social science and science. By participating in this free program, students learn to appreciate California’s water as a scarce, valuable resource.

Water Is Life Poster Contest (Grades 4-8)

As part of CBMWD's annual recognition of Water Awareness Month each May, the "Water Is Life" Poster Contest is a collaborative arts program between CBMWD and MWD. Through the contest, students are encouraged to create posters that creatively depict various water uses and/or water use. CBMWD then selects a grand-prize winner who is awarded a fully-loaded laptop computer or tablet device. The winning poster is also submitted to MWD to be included in the annual calendar and featured on water bottles and other promotional items.



Figure 4.2: CBMWD’s Board Members awards the annual “Water Is Life” Student Art Contest

Conservation Connection: Water and Energy in Southern California (Grades 6-8)

This action-based curriculum provides students with the opportunity to look critically at important environmental issues and take responsibility for finding solutions. After learning about the vital role that water and energy play in our lives, students will have the opportunity to survey their family's water and energy use and survey water and energy use in their school. From there, they will develop, implement, and monitor plans to decrease water and energy use.

Waterlogged (Grades 9-12)

A high school visitation program between CBMWD and the Roundhouse Marine Studies Lab and Aquarium, an oceanographic teaching station. The program offers local high schools five exciting curriculum programs, each aligned to the California State Science Content Standards. Through specimen dissections, examples of current aquatic/marine science research, and practical hands-on activities, students learn about the scientific method, the ecology of the Pacific Ocean, and the unintended impact of human life on the aquatic/marine environment.

Solar Cup (Grades 9-12)

A partnership between CBMWD and MWD, Solar Cup is a hands-on education program in which high school teams throughout southern California learn about water conservation and renewable energy by building and racing solar powered boats. Four CBMWD teams, along with other teams throughout southern California, compete against each other in both sprint and endurance races at Lake Skinner, in Temecula. As part of the seven-month long program, teams also research and complete various technical reports and create a water-related public service announcement. The culminating Solar Cup races take place each year in May.



Figure 4.3: Annual Solar Cup Competition

Conservation Connection Water & Energy in Southern California (Grades 5-8)

Where do we get the water and energy that we use? Will we always have enough to meet our needs? Conservation Connection answers these questions, showing the connections between California, water and energy supply, and people. But providing information is only part of Conservation Connection. The goal of the curriculum is to get students actively involved – in their homes and at school – in conserving water and energy. Within the program, students have the opportunity to survey their family's water and energy use and survey water and energy use at their school. After gathering data, analyzing their findings, and reviewing recommendations, students make, implement, and monitor plans to decrease water and energy use. By participating in this action-based curriculum, students will learn to look critically at important environmental issues and take responsibility for finding solutions.

Sewer Science (Grades 9-12)

Sewer Science is an award-winning, hands-on laboratory program that will teach high school students in CBMWD's service area about wastewater treatment. During a week-long lab course, students will create fake wastewater and employ physical, biological and chemical treatment methods and procedures to test its quality. The lab will be facilitated by biologists and chemists from LACSD, allowing students the opportunity to learn first-hand from experienced science professionals. The program meets California State Content Standards in the high school sciences for chemistry, physics, and microbiology.

GENERAL PUBLIC OUTREACH (CONSERVATION COORDINATOR)

As the regional wholesaler, CBMWD employs one full-time Management Analyst who works throughout CBMWD's service area to promote water conservation. The Management Analyst also works with cities and water agencies to foster consumer behavioral change and implement various conservation programs that result in significant reduction in overall retail water use. The current Management Analyst is Jeremy Melendez, who can be reached at 323-201-5510 or jeremym@centralbasin.org.

Sources of funding for CBMWD's water conservation program in the last five years include: Department of Energy grant, DWR grant, MWD Member Agency Conservation Program Allocation, water retail agency partnerships, and through its own fiscal budget.

GENERAL PUBLIC INFORMATION (BROCHURES, MAILINGS, WEBSITE, ETC.)

CBMWD's public information efforts consist of a variety of programs and practices that are used to educate the public about water conservation. Conservation literature is provided to the public at various one-day programs and at community events.

CBMWD also provides the community with a Speakers Bureau through which CBMWD's Board of Directors and staff work with local civic organizations and service clubs to provide information on a variety of programs and projects that promote conservation. Additionally, CBMWD provides education through our website, an interactive Blog, and various publication materials.

CBMWD has continued to engage its community through outreach and public education programs by integrating social marketing strategies with existing programs. CBMWD uses a variety of social media platforms to disseminate information through websites such as Twitter, Facebook, Instagram, Pinterest, LinkedIn and YouTube. CBMWD has realized many campaign successes of increased community involvement, which is reflective in the upward curve of its website traffic.

By using technology, CBMWD is connected with residents and businesses in a new and exciting way to promote the benefits and importance of water conservation. CBMWD's social media strategy is tailored to meet the needs of the local community. Additional Public Information and Outreach programs include:

MWD Inspection Trips

As an MWD Member Agency, CBMWD has two representatives on the MWD Board of Directors. Inspection trips are a key part of MWD's efforts to educate community leaders on water issues and the statewide water delivery system. The tours offered include: State Water Project Inspection Trip, Colorado River Aqueduct Inspection Trip and Diamond Valley Lake Inspection Trip. These tours are available throughout the year.



Figure 4.4: Inspection Trip at the Colorado River Aqueduct – Hoover Dam hosted in partnership with MWD

Water Education Tours (W.E.T.)

CBMWD offers one-day tours of the water delivery system to members of their community. Through participation in the tours, community members are educated on the key water issues facing our region and are able to visit recycled water pump stations, waste water treatment facilities, drought demonstration gardens, and a recycled water customer.

Max the Water Dog

In an effort to engage the whole family on water issues, CBMWD has introduced Max the Water Dog mascot as the latest edition to CBMWD's outreach programs. Max is a water conservation super hero that was introduced to provide a fun approach on learning about water. Max the Water Dog appears at community events and interacts with the public.



Figure 4.5: Max the Water Dog joins Girl Scouts tours of LA County Sanitation District facilities to learn about water conservation

Community Outreach Booths

Another aspect of CBMWD's community engagement efforts is Community Outreach Booths. Throughout the year, CBMWD hosts community outreach booths at a variety of community events. District representatives are on-hand to talk with members of the community about vital water issues and provide information on resources available.

4.2.3 BMP 3: RESIDENTIAL PROGRAMS

This BMP deals with showerheads, faucets, toilets, and leak detection surveys related to residential water use. This BMP is not applicable to wholesalers. CBMWD, as a wholesaler, does not provide direct service to the public, but does provide wholesale deliveries to local retail agencies.

As the region's wholesale supplier, CBMWD administers MWD's landscape programs for its retail agencies. These programs aim to help residential and commercial customers to be water efficient. Current landscape programs include rebates for Weather-Based Irrigation Controllers, Rotating Sprinkler Nozzles, Rain Barrels & Cisterns, Soil Moisture Sensor Systems, and Turf Removal, as described below:

RESIDENTIAL PROGRAMS

- ***Water Survey Assistance*** - CBMWD provides available support to local agencies in coordinating commercial water audits. The District helps coordinate surveys conducted by MWD of large homeowners associations (HOAs), nurseries, and public gardens within its service area.
- ***Rain Barrels & Cisterns Program*** - Residential and commercial customers can receive rebates for installing rain barrels and/or cisterns to collect rainwater for re-use for watering their landscapes. Customers may receive rebates starting at \$35 per barrel or \$250 per cistern. The barrels and cisterns must adhere to specified design guidelines.
- ***Weather-Based Irrigation Controllers Program*** - This program, previously called the "Smart Timer Rebate Program," started in FY



Figure 4.6: Rain Barrel distributed by CBMWD through MWD

2004-2005. Under this regional program, residential and small commercial properties are eligible for a rebate when they purchase and install a weather-based irrigation controller, which has the potential to save 13,500 gallons a year per residence. Rebates start at \$80 per controller for landscapes less than 1 acre in area and \$35 per station for more than 1 acre.

- ***Rotating Nozzle Rebate Program*** - This rebate program started in 2007 and is offered to both residential and commercial customers. Through this program, site owners will purchase and install rotary nozzles, which can use up to 20 percent less water than conventional fan spray nozzles, in existing irrigation systems. Rebates for this program start at \$2 per nozzle.
- ***Soil Moisture Sensor System Program*** - For large residential sites, a soil moisture sensor, which measures soil moisture content in the active root zone, can be installed to receive rebates starting at \$80 or \$35 per irrigation controller station. The sensor must be connected to a compatible irrigation system controller.
- ***Turf Removal Program*** - Through this program, residential and small commercial customers of participating retail water agencies are eligible to receive a minimum of \$2 per square foot (up to 5,000 square feet) of turf removed for qualifying projects.

RESIDENTIAL PLUMBING RETROFIT

This particular item is not applicable to wholesalers; however, CBMWD participates in the distribution of showerheads, aerators, and toilet tank leak detection tablets at all times. CBMWD and its retail agencies implemented an agreement with MWD for participation in a residential ultra-low-flush toilet (ULFT) retrofit and a CII retrofit incentive program that lasted through May 2010. The ULFT rebate program was replaced with a high efficiency toilet (HET) rebate program, which has been recently replaced, as of November 2015, with a premium high-efficiency toilet (PHET) rebate program. Premium high-efficiency toilets use 1.1 gallons per flush or less and use almost 20 percent less water than the WaterSense standard. As of April 2021, CBMWD is rebating \$40 per toilet for premium high-efficiency toilets through MWD funds.



Figure 4.7: Premium High-Efficiency Toilet Program and Nozzle Program Advertisement

HIGH-EFFICIENCY WASHING MACHINE REBATES

This BMP is not applicable to wholesalers; however, CBMWD implemented an agreement with MWD for participation in a high efficiency clothes washer incentive program. Through CBMWD, MWD refunds \$85 per high efficiency clothes washer (HECW).

Participants must be willing to allow an inspection of the installed machine for verification of program compliance. Machines must have a water factor of 4.0 or less and must meet or exceed the CEE Tier 1 standard. Depending on use, these machines can save about 14 gallons of water a day. Participants are encouraged to contact their local gas and/or electric utility since additional rebates may be available.



Figure 4.8: High-Efficient Washing Machines

4.2.4 BMP 4: COMMERCIAL, INDUSTRIAL, & INSTITUTIONAL PROGRAMS

This BMP deals with toilets, urinals, steamers, cooling towers, food/restaurant equipment, medical equipment, and items related to commercial, institutional, and industrial water use.

CBMWD participates in MWD's "SoCal Water\$mart" rebate program. Through MWD's SoCal Water\$mart, commercial, industrial, and institutional customers are eligible for rebates to help encourage water efficiency and conservation. The SoCal Water\$mart program offers cash rebates on a wide variety of water-saving technologies.

SoCal Water\$mart CII Program – MWD launched this program on July 1, 2008 and offers rebates to assist CII customers in replacing high-flow plumbing fixtures with low-flow fixtures. Rebates are available only on those devices listed in **Table 4.1** and must replace higher water use devices. Installation of devices is the responsibility of each participant. Participants may purchase and install as many of the water saving devices as are applicable to their site.

CII customers represent a small portion of customers within the CBMWD service area. The majority of rebates given out under this program have been for PHETs, HETs, ULFTs, and landscape devices.

Table 4.1: Retrofit Devices and Rebate Amounts Available under SoCal Water\$mart Program

Retrofit Device	Rebate Amount
Premium High-Efficiency Toilet	\$40
Ultra-Low-Water or Zero Water Urinal	\$200
Plumbing Flow Control Valves	\$5/valve (minimum of 10)
Connectionless Food Steamers	\$485/compartment
Air-Cooled Ice Machines	\$1000
Cooling Tower Conductivity Controller	\$625
pH / Conductivity Controller	\$1,750
Dry Vacuum Pumps	\$125 per 0.5 HP

4.2.5 BMP 5: LANDSCAPE PROGRAMS

This BMP deals with establishing parameters for large landscapes, including measurements, budgets, audits, prohibitions, incentives, etc. related to large landscapes.

This BMP is not applicable to wholesalers; however, CBMWD administers MWD's landscape programs for its retail agencies. These landscape programs target both residential and commercial customers.

Smart Gardening Workshops

CBMWD continues a partnership with the Los Angeles County Department of Public Works to bring free, educational gardening workshops to local residents. The workshops, which are offered in English and Spanish, provide information on California native plants, composting and gardening tips for residents, business owners, and local landscapers.



Figure 4.9: Gardening Workshop hosted by CBMWD

These partnerships have proven to be diverse in nature and valuable in strengthening the conservation efforts within CBMWD's service area, particularly within the more disadvantaged areas.

Drought Outreach Training

CBMWD conducted Drought Outreach Training for member agency city staff members as part of its outreach efforts to help the service area meet their mandated conservation goals.

Cities that serve as water retailers are the first in line of contact with residents when paying water bills and dealing with water related concerns. A handbook was designed for these city staff members to provide the latest information on the drought, water efficient rebates, and other conservation information. CBMWD staff provided copies of the handbook and provided training to member agency city staff members on how to best respond to water conservation questions.

Drought Gardening Classes

With the increased interest in removing lawns to conserve water, CBMWD partnered with MWD to host Drought Gardening Classes throughout the service area. These three-hour classes provide information and the tools on how to create drought tolerant landscaping. Residents are taught by a landscape professional. Each resident leaves the class with a better understanding on how water flows outside their home and how to best capture and use it for irrigation.

4.2.6 OTHER CBMWD CONSERVATION MEASURES

WHOLESALE AGENCY PROGRAMS

CBMWD provides financial incentives or equivalent resources, as appropriate and beneficial to retail agencies, to advance water conservation efforts and effectiveness. Incentives have thus far been in the form of rebates offered by MWD through its SoCal Water\$mart Program for residential and commercial customers. In addition to rebate programs, CBMWD continues to participate in other MWD water use efficiency programs, such as its California Friendly Landscape and Gardening classes.

Conservation Information Working Group

On a monthly basis, CBMWD meets with its purveyors to discuss various topics pertaining to water conservation and public outreach. Guest speakers are also invited to provide insight on new water efficient technologies and programs available.

SCADA Integrated Asset Management Program

The Integrated Asset Management Program is a customized computer software program that manages assets by identifying operating and maintenance inefficiencies followed by alarming operators of equipment failures. The software is unique because it uses Supervisory Control and Data Acquisition System (SCADA) data to monitor the assets and by doing so, it streamlines processes for asset maintenance and has paved the way for energy reduction.

CBMWD is currently budgeting approximately \$53,000 per year for its conservation

programs. CBMWD also receives additional funding from MWD. In FY 2020-2021, CBMWD's conservation programs include a rebate program support, landscaping classes, and various outreach and education programs.

4.3 GRANT PROGRAMS

CBMWD has been successful in receiving grant funding for conservation programs at the federal, state, and local levels through agencies, such as the United States Department of Energy (DOE), DWR, and MWD. The following list provides a brief summary of the individual water conservation grants that have been implemented since 2005:

DWR Grant (Prop 50) – High Efficiency Living Program (HELP) 10,000 HET Direct Install

In 2007, CBMWD was awarded a DWR grant in the amount of \$1,563,900. The grant program provided funding to market, purchase and install 9,000 HETs in multi-family residential units throughout the service area, which was completed in 2014. The water savings for this program will reach over 200 AFY for 25 years.

DWR Grant (Prop 50) – Urban City Makeover Program

Through the DWR Prop 50 Urban City Makeover Program, grant funding in the amount of \$113,746 provided nine disadvantaged cities with a number of water-saving resources. These included: HETs, water free urinals, native plants, weather-based irrigation controllers, and water brooms. The participating cities are: Bell Gardens, Commerce, Cudahy, Hawaiian Gardens, Huntington Park, Lynwood, Maywood, Paramount, and South Gate. This program concluded in December 2013.

DWR Grant (Prop 50) – Commercial Landscape Wireless Valve End Use Management Research Project

The Commercial Landscape Wireless Valve End Use Management Research Project awarded to CBMWD by DWR in the amount of \$302,052 involves the implementation of wireless valve ETo controllers in non-residential sites. The research goal is to enhance water management and water efficiency at the local, regional, and state-wide levels.

DWR Grant (Prop 50) – Large Landscape Water Conservation/Management and Education Program

The Large Landscape Water Conservation, Runoff Reduction and Educational Program provides \$900,000 in funding for the implementation of a water management program using weather-based irrigation controllers and wireless technologies to significantly reduce the amount of runoff from large landscapes, street medians, and residential properties.

Included in the grant funding are five large community demonstration gardens. CBMWD partners with local public agencies such as cities and school Districts to create Demonstration Gardens that enrich the environmental awareness of the community and promote the benefits of water efficient gardens.

U.S. DOE (Energy Efficiency Conservation Block Grant) Water and Energy Emergency End Use Demand Management Measures Grant

The Water and Energy Emergency End Use Demand Management Measures Grant in the amount of \$2,000,000 was awarded to CBMWD under the United States Department of Energy Recovery Act - Energy Efficiency and Conservation Block Grant Program. Under this program, funding is provided to purchase and install a series of wireless ETo controllers in residential and commercial settings that use radio commands for periodic pressure and management adjustments. A second element of the grant addresses water and energy demand management in recycled pipelines.

U.S. DOE Conservation Awareness Program (CAP)

CBMWD completed the first grant awarded to a water agency that implemented conservation in both water and embedded energy. One project component was the development of the Conservation Awareness Program (CAP). CAP is a web-based notification program that allows water retailers to send their customers notifications, ordinances, irrigation schedules, and other custom messages. Water retailers are able to create a user account to send such notices, and residents (customers) are able to subscribe to their water provider. The website also features information on water conservation practices and rebates for water efficient devices. This program is offered at no cost to both residents and water providers.

U.S. DOE Conservation Retrofit Program

On November 30, 2014, CBMWD completed the DOE Conservation Retrofit Grant Program. The participants included the Bellflower Unified School District, the Compton Unified School District, the Lynwood Unified School District, and the Montebello Unified School District. Overall, 40 school sites were audited and 32 received complete retrofits totaling to more than 8,000 completed retrofits. These installations will save an estimated 21 million gallons of water annually. These installations will assist our region in reducing our dependence on imported water supplies and will help these public facilities in decreasing their monthly water bills.

High Efficiency Living Program (Proposition 50 Grant)

On December 31, 2015, CBMWD completed the scope of work of the High Efficiency Living Program Proposition 50 Grant, which provided funding to replace high water use toilets with water efficient toilets in multi-family units throughout the service area. We

installed a total of 9,484 toilets through this program. A total of 1,793 toilets installed were 0.8 gallon per flush. The remaining 7,691 toilets installed were 1.28 gallon per flush toilets. The estimated water savings through the implementation of the grant is estimated at 8,052 AF of potable water and will have an estimated embedded energy savings of 256,391 kW for the 20-year life of toilets installed.

Southwest Water Efficiency Program (Proposition 84 Grant)

CBMWD was awarded a California Department of Water Resources Proposition 84 Water Use Efficiency grant program through the Greater Los Angeles Integrated Regional Water Management process entitled Southeast Water Efficiency Project. On November 10, 2016, CBMWD staff released the request for proposal for a contractor to assist in the water use audit of 57 sites. Based on these audits, retrofits will be performed on the devices that waste the highest amount of potable water.

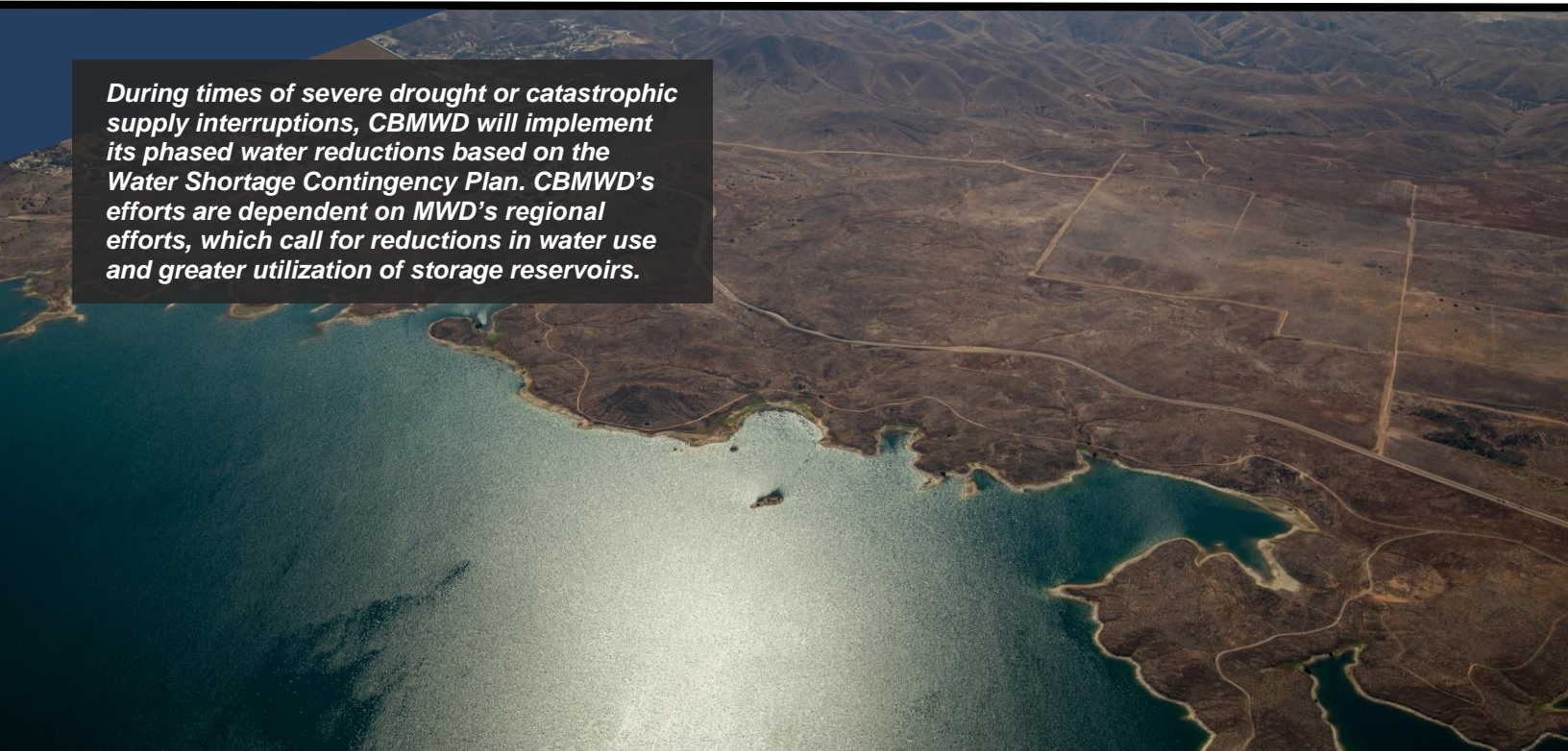
Recycled Water Customer Conversion for Disadvantaged Communities (Proposition 1)

CBMWD will be expanding the recycled water system to improve local water supply reliability specifically to Disadvantaged Communities (DAC). In order to conserve valuable potable water supply sources, this Project seeks to offset 110 AFY with recycled water for non-potable purposes. The Project will supply recycled water to nine sites within DAC locations; therefore, 100% of the Project area encompasses DACs and 100% of the benefits will go to DACs. The major physical components of the Project include approximately 4,000 linear feet (LF) of recycled water pipeline that will be connected to CBMWD's recycled water distribution system. There will be nine laterals (i.e., one to each customer) with a variety of lengths (20 to 1,400 LF). The pipelines will be installed within the public right-of-way; therefore, land acquisition and easements are not required for this Project. The anticipated physical benefits of the Project include the primary benefit of 110 AFY of recycled water supply that will offset groundwater and imported water. The secondary benefit is addressing climate change by offsetting greenhouse gas emissions and saving energy in the amount of over 0.19 metric tons of carbon dioxide per year and a savings of 220,000 kWh, respectively. The intended outcome of the Project is to reduce potable water demand by 110 AFY by offsetting groundwater and imported water supplies with locally-produced recycled water from the LACSD. Additionally, the Project will offset the amount of greenhouse gases being emitted and energy being consumed by reducing imported water and groundwater pumping.

4.4 CBMWD CONSERVATION PHILOSOPHY

CBMWD recognizes the importance of the BMPs in reducing water demand and will continue to implement the programs during normal supply periods. Also, during a shortage,

CBMWD and its member agencies would increase media attention to the water supply situation, emphasize public water education programs, and continue to advertise to customers the importance of installing ULF plumbing fixtures and outdoor conservation methods.

An aerial photograph showing a large, deep blue reservoir in the foreground, surrounded by dry, brownish-yellow hills and sparse vegetation. The landscape is arid, with visible dirt roads and some small structures in the distance. The sky is clear and blue.

During times of severe drought or catastrophic supply interruptions, CBMWD will implement its phased water reductions based on the Water Shortage Contingency Plan. CBMWD's efforts are dependent on MWD's regional efforts, which call for reductions in water use and greater utilization of storage reservoirs.

SECTION 5: WATER SHORTAGE CONTINGENCY PLAN

CENTRAL BASIN MUNICIPAL WATER DISTRICT | 2020 URBAN WATER MANAGEMENT PLAN

SECTION 5

WATER SHORTAGE CONTINGENCY PLAN

5.1 OVERVIEW

Water supplies may be interrupted or reduced significantly in a number of ways, including droughts, earthquakes, and power outages, which hinder a water agency's ability to effectively deliver water. The ability to manage water supplies in times of drought or other emergencies is an important part of water resources management for a community.

Recent water supply challenges throughout the American Southwest and the State of California have resulted in the development of a number of policy actions that water agencies would implement in the event of a water shortage. In Southern California, the development of such policies has occurred at both the wholesale and retail level. This section addresses elements related to the urban water supplier's Water Shortage Contingency Plan (WSCP) describing new and existing policies that MWD and CBMWD have in place to respond to water supply shortages, including a catastrophic interruption and up to 50 percent or greater reduction in water supply.

5.2 WATER SUPPLY RELIABILITY ANALYSIS

Southern California is expected to experience an increase in regional demands in the years 2025 through 2045 as a result of population growth. Although increases in demand are expected, future demands are effectively limited due to the requirements of SBx7-7. It can be reasonably expected that the majority of agencies have met or were near their compliance targets for 2020 and will continue to meet, or will soon meet, their per-capita usage limit in the future.

The data in the MWD 2020 UWMP shows supply reliability projections for average and single dry years and is important to effectively project and analyze supply and demand over the next 25 years for many regional agencies. Projected supplies during single and multiple dry year scenarios indicate MWD's projected supply will exceed its projected single dry year demands in all years. Likewise, for average years, MWD supply exceeds projected demands for all years.

Due to the semi-arid nature of CBMWD's climate and as a result of past drought conditions, CBMWD is vulnerable to water shortages due to its climatic environment and seasonally hot summer months. **Section 3** describes the water availability during single and multiple dry year scenarios. **Tables 5.1, 5.2, and 5.3** summarize the supply and demand comparisons during normal, single-dry year, and multiple dry year, respectively. As shown, CBMWD is capable of providing a reliable supply of water to meet the future demands.

Table 5.1: Normal Year Supply & Demand Comparison (AF) (DWR Table 7-2 W)

	2025	2030	2035	2040	2045
Supply totals	308,033	313,940	319,898	325,165	328,659
Demand totals	260,234	260,942	262,197	263,096	264,664
Difference	47,799	52,998	57,701	62,069	63,995

Table 5.2: Single Dry Year Supply & Demand Comparison (AF) (DWR Table 7-3 W)

	2025	2030	2035	2040	2045
Supply totals	308,033	313,940	319,898	325,165	328,659
Demand totals	261,446	262,156	263,412	264,312	265,881
Difference	46,587	51,784	56,486	60,853	62,778

Table 5.3: Multiple Dry Year Supply & Demand Comparison (AF) (DWR Table 7-4 W)

		2025	2030	2035	2040	2045
First year	Supply totals	308,033	313,940	319,898	325,165	328,659
	Demand totals	256,250	262,705	263,736	264,774	266,072
	Difference	51,783	51,235	56,162	60,391	62,587
Second year	Supply totals	308,033	313,940	319,898	325,165	328,659
	Demand totals	256,250	262,705	263,736	264,774	266,072
	Difference	51,783	51,235	56,162	60,391	62,587
Third year	Supply totals	308,033	313,940	319,898	325,165	328,659
	Demand totals	256,250	262,705	263,736	264,774	266,072
	Difference	51,783	51,235	56,162	60,391	62,587
Fourth year	Supply totals	308,033	313,940	319,898	325,165	328,659
	Demand totals	256,250	262,705	263,736	264,774	266,072
	Difference	51,783	51,235	56,162	60,391	62,587
Fifth year	Supply totals	308,033	313,940	319,898	325,165	328,659
	Demand totals	256,250	262,705	263,736	264,774	266,072
	Difference	51,783	51,235	56,162	60,391	62,587

New to the 2020 UWMP is the Drought Risk Assessment (DRA) over a 5-year period examining the reliability of CBMWD's water supplies. **Table 5.4** shows the results of the analysis. The analysis was done utilizing DWR's DRA Planning Tool to determine supply and demand projections, and to analyze CBMWD's vulnerability to droughts. The tool also allows water purveyors to utilize potential water usage saving or supply augmentation methods to mitigate supply shortfalls. These water usages saving methods (restrictions) are further discussed in the WSCP. As shown, CBMWD is capable to meet the projected demands based on the estimated water supplies during drought conditions without the need for WSCP stage implementation.

Table 5.4: Five-Year Drought Risk Assessment (DWR Table 7-5)

	2021	2022	2023	2024	2025
Total Water Use	259,143	259,363	259,583	259,804	260,234
Total Supplies	308,033	308,033	308,033	308,033	308,033
Surplus/Shortfall w/o WSCP Action	48,890	48,670	48,450	48,229	47,799
Planned WSCP Actions (Use Reduction and Supply Augmentation)					
Supply Augmentation Benefit from WSCP Response	0	0	0	0	0
Use Reduction Savings Benefit from WSCP Response	0	0	0	0	0
Revised Surplus/Shortfall	48,890	48,670	48,450	48,229	47,799
Resulting % Use Reduction from WSCP Action	0%	0%	0%	0%	0%

As a matter of practice, MWD does not provide annual estimates of the minimum supplies available to its member agencies. As such, MWD member agencies must develop their own estimates. As captured in its 2020 UWMP, MWD believes that the water supply and demand management actions it is undertaking will increase its reliability throughout the 25-year period addressed in its plan. Thus, for purposes of this estimate, it is assumed that

MWD and CBMWD will be able to maintain the identified supply amounts throughout the five-year period.

Response to a future drought would follow the water use efficiency mandates of the CBMWD's Water Supply Allocation Plan (WSAP) along with implementation of the appropriate stage of regional plans, such as MWD's Water Surplus and Drought Management (WSDM) Plan as described later in this Section.

5.3 ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

Under CWC Section 10632(a)(2), beginning by July 1, 2022, each urban water supplier is required to prepare their annual water supply and demand assessment (Annual Assessment) and submit an Annual Water Shortage Assessment Report to DWR. The Annual Water Shortage Assessment Report will be due by July 1 of every year, as required by CWC Section 10632.1.

This section outlines CBMWD's procedures used in conducting an Annual Assessment, including the following: 1) written decision-making process for determining water supply reliability; and 2) key data inputs and assessment methodology for evaluating the water supply reliability for the current year and one dry year.

5.3.1 DECISION-MAKING PROCESS

CBMWD's Annual Assessment will be mostly based on daily recorded wholesale water production and supply figures, which are reported to the General Manager on a daily basis throughout the year. Water consumption is monitored regularly and totals are reported each month to the Board of Directors. To determine its water supply reliability and actual reductions in water use during declared water shortages or emergencies, CBMWD can rely on its daily and monthly records. These periodical analyses are used by CBMWD to manage resources to meet projected demands and adjust to changing conditions (i.e., precipitation) throughout the year.

Starting in 2022, CBMWD staff will submit and present a finalized Annual Water Shortage Assessment Report to the Board of Directors for approval by June each year. CBMWD staff will also present determination of recommended water shortage response actions deemed appropriate as a result of the Annual Assessment. Following approval, CBMWD staff will submit the approved Annual Water Shortage Assessment Report to DWR by July

1 of every year. The functional procedures for the decision-making process are depicted in the following timeline shown in **Figure 5.1**.

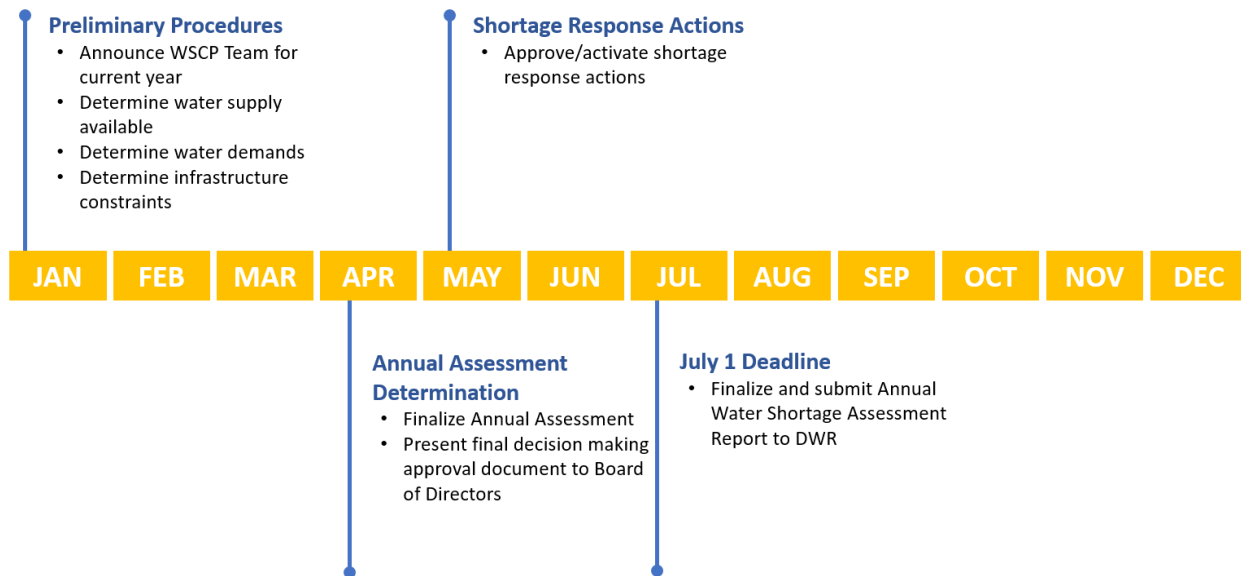


Figure 5.1: Sample Annual Assessment Decision-Making Process Timeline

5.3.2 KEY DATA INPUTS AND ASSESSMENT METHODOLOGY

This section defines the key data inputs and assessment methodology used to evaluate the water supply reliability for the anticipated conditions for the current year and for one dry year that follows. The Annual Assessment determination will focus on the current year unconstrained demand, infrastructure constraints, and total water supply availability. Moreover, the Annual Assessment will consider the current year's weather, population growth, policies in place that will impact demands, and other influencing factors. The current year available supply will incorporate the hydrological regulatory conditions for the current year and following dry year.

LOCALLY APPLICABLE EVALUATION CRITERIA

The locally applicable evaluation criteria that will be consistently relied on for each Annual Assessment include the following:

- 1) Assumed unconstrained demand (i.e., demand without any conservation measures) for current year and one dry year
- 2) Assumed total water supply availability for current year and one dry year
- 3) Existing infrastructure capabilities and plausible constraints
 - Any known issues with the water facilities (including water quality conditions)

limiting local sources)

- Planned power outages for operation and maintenance
- New construction and repairs
- Environmental mitigation measures
- Other constraints that may affect near-term water supply reliability

WATER SUPPLY SOURCES DESCRIPTION AND QUANTIFICATION

As part of the Annual Assessment, the total available water supply evaluation criteria will comprise of CBMWD's water supply sources as shown and quantified in **Tables 5.5** and **5.6**.

Table 5.5: CBMWD Water Supplies in 2020 (AF) (DWR Table 6-8 W)

Water Supply	Additional Detail on Water Supply	2020	
		Actual Volume	Water Quality
Purchased or Imported Water	Retail Agencies	16,441	Drinking Water
Purchased or Imported Water	WRD	0	Raw Water
Other	GW Production	165,619	Drinking Water
Recycled Water	Municipal, Industrial, and Agricultural Use	4,491	Recycled Water
Other	GW Recharge / Montebello Forebay	53,988	Recycled Water
Total		242,765	

Table 5.6: Projected Water Supplies to Member Agencies (AF) (DWR Table 6-9 W)

Water Supply	Additional Description	Projected Water Use (Reasonably Available Volume)				
		2025	2030	2035	2040	2045
Purchased or Imported Water	MWD	71,770	71,770	71,770	71,770	71,770
Other	GW Production	174,925	179,298	183,685	187,340	189,183
Recycled Water	Municipal, Industrial, and Agricultural Use	6,759	6,928	7,101	7,279	7,461
Other	GW Recharge / Montebello Forebay	54,579	55,944	57,342	58,776	60,245
TOTAL		308,033	313,940	319,898	324,165	328,659

Imported Water Purchases

CBMWD purchases imported water from MWD and delivers it to its member agencies, including WRD, imports replenishment water from CBMWD to replenish the Central Groundwater Basin. CBMWD has delivered Non-Interruptible Water (treated full service), Seasonal Treated Replenishment Water, and Seasonal Untreated Replenishment Water received from MWD. **Table 5.6** shows the average year supplies from MWD in five-year increments from 2025 to 2045.

Groundwater Supply

As a wholesale agency, CBMWD does not extract groundwater. In contrast, groundwater has been the primary water supply within the CBMWD service area for many years. The Central Groundwater Basin is adjudicated and predominately comprised of 12 aquifers, with two large unconfined merged aquifer forebays, the Montebello Forebay and the Los Angeles Forebay.

Recycled Water Supply

CBMWD obtains recycled water supply from the San Jose Creek Water Reclamation Plant in the City of Whittier as well as the Los Coyotes Water Reclamation Plant in the City of Cerritos. Owned and operated by the Sanitation Districts of Los Angeles County, these two reclamation plants produce effluent that meets the most stringent requirements for water recycling and recycled water reuse. CBMWD's recycled water distribution system includes more than 80 miles of pipeline with four pump stations. These four pump stations comprise of the Rio Hondo Pump Station, Hollydale Pump Station, Cudahy Pump Station, and Cerritos Pump Station owned by the City of Cerritos.

5.4 SHORTAGE STAGES AND SHORTAGE RESPONSE ACTIONS

5.4.1 MWD STAGES OF ACTION

WATER SURPLUS & DROUGHT MANAGEMENT PLAN (WSDM)

In addition to the provisions of CBMWD's WSAP, CBMWD also works in conjunction with MWD to implement conservation measures within the framework of MWD's Water Surplus and Drought Management (WSDM) Plan. The WSDM Plan was developed in 1999 by MWD with assistance and input with its member agencies. The plan addresses both

surplus and shortage contingencies. MWD's WSDM Plan documents the stages of action that it would undertake in response to a water supply shortage. CBMWD's water supply shortage stages reflect MWD's WSDM Plan.

The WSDM Plan's guiding principle is to minimize adverse impacts of water shortage. The plan guides the operations of water resources (local resources, Colorado River, SWP, and regional storage) to ensure regional reliability. It identifies the expected sequence of resource management actions MWD will take during surpluses and shortages of water to minimize the probability of severe shortages that require curtailment of full-service demands. Mandatory allocations are avoided to the extent practicable; however, in the event of an extreme shortage, an allocation plan will be implemented.



Figure 5.2: Severe Droughts Highlight the Importance of Conservation Ordinances (Lake Oroville in 2014)

In addition to its WSDM Plan, MWD developed a WSAP, which provides a standardized methodology for allocation of supplies during times of extreme shortage (Stage 7 in MWD's WSDM Plan). During a shortage, CBMWD's imported water supplies will be allocated based on the methodology documented in CBMWD's allocation plan, which mostly mirrors the MWD allocation plan.

The following description of shortage stages is from MWD's 2020 UWMP, page 2-29:

“Shortage: Metropolitan can meet full-service demands and partially meet or fully meet interruptible demands, using stored water or water transfers as necessary.

Severe Shortage: Metropolitan can meet full-service demands only by using stored water, transfers, and possibly calling for extraordinary conservation.

Extreme Shortage: Metropolitan allocates available supply to full-service customers.

MWD's WSDM and WSAP Plans help guide drought management for many agencies throughout the region.

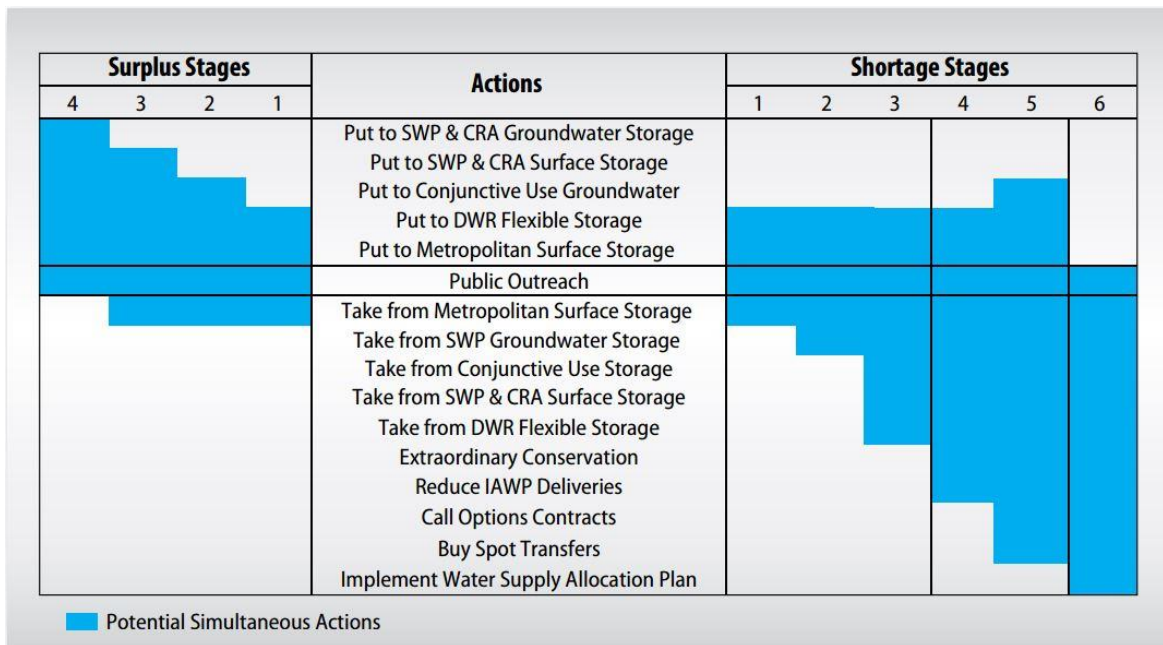


Figure 5.3: MWD WSDM Surplus & Drought Stages

The WSDM Plan also defines six shortage management stages to guide resource management activities. These stages are not defined merely by shortfalls in imported water supply, but also by the water balances in Metropolitan’s storage programs. Thus, a 10 percent shortfall in imported supplies could be a stage one shortage if storage levels are high. If storage levels are already depleted, the same shortfall in imported supplies could potentially be defined as a more severe shortage.

When Metropolitan must make net withdrawals from storage to meet demands, it is considered to be in a shortage condition. Under most of these stages, Metropolitan is still able to meet all end-use demands for water. For shortage stages 1 through 3, Metropolitan will meet demands by withdrawing water from storage. At shortage stages 4 and 5, Metropolitan may undertake additional shortage management steps, including issuing public calls for extraordinary conservation and exercising water transfer options, or purchasing water on the open market.”

MWD WATER SUPPLY ALLOCATION PLAN (FOR WSDM SHORTAGE STAGE 7)

In February 2008, MWD’s Board of Directors adopted a WSAP, which includes a methodology for calculating supply allocations in the event that MWD enters a Shortage Stage 7 and is unable to meet the firm demands of its member agencies. MWD revised its WSAP in 2014 to include the following updates: new FY 12-13 to FY 13-14 baseline,

implement a Conservation Demand Hardening Adjustment, create a separate Groundwater Replenishment Allocation for applicable agencies, and replace WSAP Penalty Rates with Allocation Surcharges based on the marginal costs of turf removal. It should be noted that the WSAP is not a rationing plan. Rather, it is a pricing plan where water is allocated at regular prices and agencies that choose to take more water pay surcharges. The surcharge pricing mechanism acts to discourage the use of water above the allocation. The WSAP uses a combination of estimated total retail demands and historical local supply production within the member agency service area to estimate the demands on MWD from each member agency in a given year. Based on a number of factors, including storage and supply conditions, MWD then determines whether it has the ability to meet these demands or will need to allocate its limited supplies among its member agencies. Thus, implicit in MWD's decision not to implement an allocation of its supplies is that, at a minimum, MWD will be able to meet the demands identified for each of the member agencies.

According to MWD's 2015 IRP, the approach seeks to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level and takes into account growth, local investments, changes in supply conditions and the demand hardening aspects of non-potable recycled water use and the implementation of conservation savings programs. The methodology attempts to allocate supplies based on an estimate of an agency's relative need for imported water using the following process:

When a WSDM Shortage Stage 7 is triggered, MWD's WSAP helps to assess resources in the most equitable way possible.

1. Establish a baseline for total retail demands (and adjust for growth) to determine the allocation year total retail demands. (*"What are your total water demands?"*)
2. Estimate the amount of local supplies to be utilized in the allocation year and subtract from total retail demands. This is the allocation year baseline demand on MWD. (*"How much imported water do you need from MWD?"*)
3. Apply the minimum allocation percentage (per the regional shortage level) to the allocation year baseline demand and provide minor adjustments based on various criteria. (*"Restrict normal supply deliveries and provide allocation."*)

BASE PERIOD CALCULATIONS (USED TO DETERMINE WSAP REDUCTIONS)

The Base Period is calculated using data from FY 2012-13 and FY 2013-14. Base Period wholesale demands are based on the two-year average of demands on MWD during the Base Period, including full-service, seawater barrier, seasonal shift, and surface storage operating agreement demands.

Local supplies for the base period are calculated using a two-year average of groundwater production, groundwater recovery, Los Angeles Aqueduct supply, surface water production, and other imported supplies. Non-potable recycling production is not included in this calculation, which, according to MWD, is intended to address the impact of demand hardening due to recycled water use.

Total potable retail demands for the Base Period are then calculated by adding the Base Period wholesale demands on MWD and the Base Period local supplies.

WSAP ALLOCATION YEAR CALCULATIONS

The next step is to estimate water needs in an allocation year by (1) adjusting the Base Period total retail demands for population or economic growth, and (2) accounting for changes in local supplies.

The Base Period retail demands are adjusted for growth using the average annual rate of population growth occurring since the two-year base period based on county-level data generated by the California Department of Finance.

Next, these growth-adjusted demands are adjusted again to account for (1) gains and losses of local supply, and (2) extraordinary increases in production over the base year. According to MWD, these adjustments are made to give a more accurate estimate of actual supplies in the allocation year, and, in turn, more accurately reflect an agency's demand for MWD supplies.

The adjustment for gains in local supplies is intended to account for planned or scheduled gains in local supply production above the Base Period, which are not due to extraordinary actions to increase water supply in the allocation year. These previously scheduled increases in supply programs (i.e., SDCWA/IID) or local production are added to the base period local supplies. Again, new supplies from non-potable recycling projects are not counted as local supplies.



Figure 5.4: Reservoirs Provide Emergency Supplies (Lake Skinner)

While the local agency does become more reliable with the addition of the new supplies, assuming that the new supplies are available during an allocation, the benefits of these programs are partially offset because the impact of adding the new supplies to the Base Period local supplies is to reduce an agency's dependence on MWD and thus their allocation under the WSAP.

Alternatively, only a portion of the additional supplies from what are termed "extraordinary increases in production" are added back to Allocation Year local supplies depending on the retail shortage level. Extraordinary increases in production include such efforts as purchasing transfers or mining of groundwater basins. By adding only a percentage of the yield from these supplies to Allocation Year local supplies, it has the effect of "setting aside" the majority of yield for the agency who procured the supply.

Table 5.7 reflects the set of percentages used in the WSAP to establish water allocations for each agency.

Table 5.7: Water Allocation Percentages

Regional Shortage Level	Regional Shortage Percentage	Wholesale Minimum Percentage	Maximum Retail Impact Adjustment Maximum
1	5%	92.5%	2.5%
2	10%	85.0%	5.0%
3	15%	77.5%	7.5%
4	20%	70.0%	10.0%
5	25%	62.5%	12.5%
6	30%	55.0%	15.0%
7	35%	47.5%	17.5%
8	40%	40.0%	20.0%
9	45%	32.5%	22.5%
10	50%	25.0%	25.0%

5.4.2 CBMWD STAGES OF ACTION

Water shortage stages can be implemented depending on the severity of the water shortage situation, in order to respond to a reduction in potable water available for delivery. In addition to water supply reductions, each stage typically has water use restrictions that promote the efficient use of water, reduce or eliminate water waste, and enable implementation of Water Shortage Contingency Measures. CBMWD has a WSAP, detailed in **Section 5.4.3**. CBMWD's expected water allocation during a shortage is summarized in **Table 5.8**.

Per CWC Section 10632(a)(3)(B), a supplier may continue using their own water shortage levels that were previously used. In accordance with this allowance, CBMWD has chosen to continue to use its current water shortage levels in its new WSCP and has included a graphic (**Table 5.8**) to correlate its water shortage levels to the six standard water shortage levels mandated by CWC Section 10632(a)(3)(A).

Table 5.8: Water Supply Shortage Stages – Rationing Stages

CBMWD Shortage Levels			Mandated Standard Shortage Levels	
Stage No.	Estimated Allocated Supplies for CBMWD	% Shortage	Shortage Level	% Shortage
1	29,474	Up to 8%	1	Up to 10%
2	27,211	Up to 15%	2	Up to 20%
3	24,947	Up to 23%	3	Up to 30%
4	22,684	Up to 30%		
5	20,421	Up to 38%	4	Up to 40%
6	18,158	Up to 45%	5	Up to 50%
7	16,720	Up to 50%		
8	13,632	Up to 60%	6	>50%
9	11,368	Up to 68%		
10	9,105	Up to 75%		

5.4.3 CBMWD WSAP

CBMWD's Board of Directors approved to move forward reevaluating CBMWD's existing plan. The framework for CBMWD's WSAP contains similar guiding principles under MWD's plan.

- The baseline for CBMWD retail agency demand is estimated on a two-year average during FY 2012-13 and FY 2013-14.
- Conservation demand hardening credits can be applied using a method based on GPCD water use reductions. Qualifying mandatory conservation ordinances and requirements can be taken into consideration.
- Includes a provision for replenishment water deliveries to drought-impacted groundwater basins through a qualifying consultation process with MWD.
- An Allocation Surcharge will be imposed on agencies who exceed their maximum allocated supplies.

CBMWD has developed a model used in calculating allocated supplies for each of its retailers that have imported water connections. **Table 5.8** shows the estimated reductions that would be imposed on CBMWD's imported water demands based on MWD's allocation reduction percentages.

Previous penalty rates were replaced with an Allocation Surcharge that is based on the cost associated with MWD's turf removal program. MWD's current cost to remove turf is \$2 per square foot, and the estimated water savings for turf removal is 44 gallons per year for a period of 10 years. The estimated cost of the program is \$1,480 per AF. Two times the Allocation Surcharge amount at \$2,960 per AF would allow funding of additional conservation programs to further reduce demand on imported water. Therefore, water use between 100 percent and 115 percent of the allocated amount will result in an Allocation Surcharge of \$1,480 per AF. Water use greater than 115 percent of the allocated amount will result in an Allocation Surcharge of \$2,960 per AF. The WSAP became effective when a regional shortage was declared by MWD in 2015. The allocation period typically covers a fiscal year 12-month period beginning in July and ending in the following June. Monthly reports are used to track potential overage of annual allocations that might be charged at the end of the 12-month allocation period (CBMWD, Imported Water Supply Allocation Plan, October 2014).

5.4.4 CATASTROPHIC SUPPLY INTERRUPTION

A water shortage emergency could be caused by a catastrophic event such as result of drought, failures of transmission facilities, a regional power outage, earthquake, flooding, supply contamination from chemical spills, and other adverse conditions. Given the great distances imported water supplies travel to reach the CBMWD service area, the region is vulnerable to interruptions along hundreds of miles of pipelines and other facilities associated with delivering the supplies to the region. Additionally, this water is distributed to customers through an intricate network of pipes and water mains that are susceptible to damage from earthquakes and other disasters, natural or otherwise.

MWD

MWD has comprehensive plans for stages of actions it would undertake to address a catastrophic interruption in water supplies through its WSDM and WSAP Plans. MWD also developed an Emergency Storage Objective to mitigate potential interruption in water supplies resulting from catastrophic occurrences within the Southern California region, including seismic events along the San Andreas Fault. In addition, MWD is working with

the state to implement a comprehensive improvement plan to address catastrophic occurrences that could occur outside of the Southern California region, such as a probable maximum seismic event in the Delta, which could cause levee failure and disruption of SWP deliveries.

In July 2019, MWD's Board adopted amendments to their Administrative Code allowing deliveries of member agency water supplies in MWD's system during an emergency. With these enabled deliveries, MWD's member agencies will be able to deliver their water through MWD's system under specific emergency conditions. Emergency deliveries using a portion of MWD's system can only be made if MWD is unable to make deliveries to a member agency due to physical damage to its system resulting from a natural disaster or other emergency, and there are no alternatives.

CBMWD

In the event imported water supplies are interrupted by a catastrophic event, CBMWD, through coordination with MWD, can respond at both a regional and local level.

In the event that an emergency, such as an earthquake or system failure, affects the entire southern California region, MWD would take the lead and activate its Emergency Operation Center (EOC). The EOC coordinates MWD's and CBMWD's responses to the emergency and concentrates efforts to ensure the system can begin distributing potable water in a timely manner.

If circumstances render the southern California's aqueducts out of service, MWD's Diamond Valley Lake is expected to provide emergency storage supplies for its entire service area's firm demand for up to six months. With few exceptions, MWD can deliver this emergency supply throughout its service area via gravity flow, thereby



Figure 5.5: MWD's Diamond Valley Lake (Potential Reserves for WSAP Allocations)

eliminating dependence on power sources that could also be disrupted. Furthermore, should additional supplies be needed, MWD also has surface reservoirs and groundwater conjunctive use storage accounts that can be drawn upon to meet demands. The WSDM Plan guides MWD's management of available supplies and resources during an emergency

to minimize the impacts of a catastrophic event.

In July 2019, MWD's Board adopted amendments to their Administrative Code allowing deliveries of member agency water supplies in MWD's system during an emergency. With these enabled deliveries, MWD's member agencies will be able to deliver their water through MWD's system under specific emergency conditions. Emergency deliveries using a portion of MWD's system can only be made if MWD is unable to make deliveries to a member agency due to physical damage to its system resulting from a natural disaster or other emergency, and there are no alternatives.

5.4.5 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

INTRODUCTION

Earthquakes can vary significantly in magnitude and the amount of damage caused. Major earthquakes can cause loss of electrical power, damage to CBMWD's structures and equipment, disruption of service, and injuries to staff. This Section provides a description of CBMWD's procedures (i.e., response and mitigation) after an earthquake event.

As mandated in CWC Section 10632.5, beginning January 1, 2020, water suppliers are required to include a seismic risk assessment and mitigation plan as part of their WSCP to assess the vulnerability of each of the various facilities of their water system and mitigate those vulnerabilities. If an urban water supplier does not have a seismic risk assessment and mitigation plan, the urban water supplier



Figure 5.6: Hollydale Booster Pump Station in South Gate, CA

may instead, per CWC Section 10632.5(c), include a local hazard mitigation plan (LHMP) or a multi-hazard mitigation plan. Although CBMWD does not currently have a seismic risk assessment and mitigation plan, this requirement is satisfied by the incorporation of elements and assessments from CBMWD's Risk and Resilience Assessment (RRA), Emergency Response Plan (ERP), the 2019 County of Los Angeles All-Hazards Mitigation Plan, and LHMPs of two of CBMWD's member agencies: City of South Gate (**Appendix**

G) and City of Whittier (**Appendix H**). The complete RRA and ERP documents are not presented within this plan due to the highly confidential nature of the reports. Because CBMWD only has two above ground water facilities, which are the Hollydale Booster Pump Station and the Rio Hondo Pump Station located in the cities of South Gate and Whittier, respectively, CBMWD does not currently have a timeline to develop an LHMP of its own.

SEISMOLOGY OF WATER FACILITIES & VULNERABILITY

An earthquake is caused by the shifting of tectonic plates beneath the Earth's surface. Ground shaking from moving geologic plates collapses buildings and bridges, and sometimes triggers landslides, avalanches, flash floods, fires and tsunamis. The strong ground motion of earthquakes has the potential to cause a great deal of damage to drinking water and wastewater utilities, particularly since most utility components are constructed from inflexible materials (i.e., concrete, metal pipes). Earthquakes create many cascading and secondary impacts that may include, but are not limited to:

- Structural damage to facility infrastructure and equipment
- Water tank damage or collapse
- Water source transmission line realignment or damage
- Damage to distribution lines due to shifting ground and soil liquefaction, resulting in potential water loss, water service interruptions, low pressure, contamination and sinkholes and/or large pools of water throughout the service area
- Loss of power and communication infrastructure
- Restricted access to facilities due to debris and damage to roadways

Additional seismic risks are further described in the LHMPs of the cities of South Gate and Whittier.

According to the maps provided on the California Office of Emergency Services' online planning tool (My Plan) and the California Geological Survey's online earthquake hazards zone application (EQ Zapp), no portion of CBMWD's system is crossed by a known fault line as shown in **Figure 5.6**. Therefore, there are no CBMWD water structures with an extremely high risk of earthquake damage. There are, however, areas indicated in the LHMPs of the cities of South Gate and Whittier with increased risk due to landslides and liquefaction, and two CBMWD above ground pump stations (shown in **Figure 5.6**) that are more susceptible to earthquake damage and earthquake-induced liquefaction than other facilities.



Hazard mitigation may occur during any phase of a threat, emergency, or disaster. Mitigation can and may take place during the preparedness (before), response (during), and recovery (after) phases. The process of hazard mitigation involves evaluating a hazard's impact and identifying and implementing actions to minimize or eliminate the impact.



The following mitigation actions goals established by the County of Los Angeles and the cities of South and Whittier to mitigate seismic risks and vulnerabilities are further described within their respective hazard mitigation plans.

The goals of the 2019 County of Los Angeles All-Hazards Mitigation Plan are based on a risk assessment, representing a long-term vision for hazard reduction or enhanced

mitigation capabilities.

The five mitigation goals and descriptions are listed below:

1. ***Protect Life and Property*** – Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to losses from natural, human-caused, and technological hazards. Improve hazard assessment information to make recommendations for avoiding new development in high-hazard areas and encouraging preventive measures for existing development in areas vulnerable to natural, human-caused, and technological hazards.
2. ***Enhance Public Awareness*** – Develop and implement education and outreach programs to increase public awareness of the risks associated with natural, human-caused, and technological hazards. Provide information on tools, partnership opportunities, and funding resources to assist in implementing mitigation activities.
3. ***Preserve Natural Systems*** – Support management and land use planning practices with hazard mitigation to protect life. Preserve, rehabilitate, and enhance natural systems to serve hazard mitigation functions.
4. ***Encourage Partnerships and Implementation*** – Strengthen communication and coordinate participation with public agencies, citizens, nonprofit organizations, business, and industry to support implementation. Encourage leadership within the County and public organizations to prioritize and implement local and regional hazard mitigation activities.
5. ***Strengthen Emergency Services*** – Establish policy to ensure mitigation projects are considered for critical facilities, services, and infrastructure.

City of South Gate

According to the City of South Gate’s 2018 LHMP, mitigation actions for seismic hazards include, but are not limited to, the following:

- Conduct a comprehensive and ongoing education campaign to improve awareness of hazard threats and ways to reduce risks.
- Adopt, implement, and actively enforce the current state building code.
- Retrofit City of South Gate-owned facilities and infrastructure, including water

storage tanks, to increase resiliency to seismic hazards and to remain operable immediately after seismic events.

- If deemed necessary, conduct a seismic study for public buildings and infrastructure and retrofit facilities based on findings and available funding.
- Adopt a phased ordinance for seismic retrofits to require existing unreinforced buildings to meet current seismic standards. Identify and secure to the extent possible funding to assist property owners with retrofit costs.
- In coordination with state and regional agencies, conduct seismic evaluations of infrastructure owned by other agencies in the City of South Gate (i.e., CBMWD), including electrical wires and natural gas pipelines, and identify funding sources to conduct seismic retrofits of vulnerable infrastructure.

City of Whittier

The mitigation actions for earthquake related hazards described in the City of Whittier's 2015 LHMP include, but are not limited to, the following:

- Develop, enhance, and implement education programs aimed at mitigating natural hazards, and reducing the risk to citizens, public agencies and private property
- Utilize existing public safety announcements on mitigation steps and strategies (i.e., residential earthquake retrofitting).
- Review seismic strength of remodeled structures in the City of Whittier as deemed appropriate by the building official.
- Ensure post-disaster rebuilding is in conformance with applicable codes, specifications, and standards.
- Encourage construction and subdivision design that can be applied to steep slopes to reduce the potential adverse impacts from ground failure, mudslides, etc.
- Encourage private property owners to conduct seismic strength evaluations of facilities classified as critical or essential to City of Whittier emergency response activities.

5.5 COMMUNICATION PROTOCOLS

5.5.1 INTRODUCTION

CBMWD's communication protocol includes the various channels that CBMWD will utilize to convey critical messages regarding water shortage allocations and voluntary and mandatory actions. A strong communication strategy and a common understanding on the water supply situation and necessary actions between CBMWD and its member agencies,

the public, elected officials, and other key stakeholders are essential should the WSCP need to be activated. How the water shortage messages are addressed to the public are described in this communication protocol. The communication protocol will be in place prior to a water supply shortage. Activation of the communication protocol will continue through all subsequent water shortage stages. CBMWD will ensure outreach efforts are reaching key audiences as needed.

It is important to communicate to its customers the following when urgent conservation is needed:

- Which shortage stage is being implemented;
- What response actions are triggered to save water;
- Why water needs to be saved; and
- What actions CBMWD is taking to respond to the water supply situation.

5.5.2 COORDINATION

The goal of CBMWD's outreach plans during dry periods and water shortages is to maintain effective coordination with key audiences. In order to maintain reliability in this communication, CBMWD will work closely with the Board of Directors. During dry periods or other times of limited supply, the frequency and extent of coordination will increase to ensure outreach tactics are consistent with the changing needs of CBMWD and its member agencies. In addition to collaboration with its wholesaler, MWD, CBMWD will seek opportunities with outside organizations and agencies to complement its own outreach.

5.5.3 COMMUNICATION GOALS

Communication objectives during an existing or anticipated water shortage condition include the following:

- Motivate key audiences (i.e., member agencies) to increase conservation in following any voluntary or mandatory actions called for at the current stage of the WSCP.
- Raise awareness of the drought, regulations, or other conditions affecting water sources and supplies.
- Educate customers, key stakeholders, elected officials, and the general public about water supply reliability, water quality, and water delivery.

- Prepare member agencies for any potential escalation of the supply shortage stages.

5.5.4 COMMUNICATION PROTOCOL FOR CURRENT OR PREDICTED SHORTAGE

A current or predicted shortage, as determined by CBMWD's Annual Assessment, will be addressed to the public and its customers upon submittal of the Annual Water Shortage Assessment Report to DWR by July 1 of every year. This notice may be conducted by CBMWD's website, signage in front of the CBMWD Office, and coordination with its wholesale and member agencies.

5.5.5 COMMUNICATION PROTOCOL FOR SHORTAGE RESPONSE ACTIONS TRIGGERED OR ANTICIPATED TO BE TRIGGERED

CBMWD's member agencies and public will be notified about any triggered or anticipated to be triggered shortage response actions. CBMWD monitors and measures the projected supply and demand for water by its customers monthly and recommends the stage of conservation required to the Board of Directors.

The Board will change the stage designation as appropriate; however, the Board will not impose mandatory measures without first conducting a duly-noticed public hearing pursuant to CWC Sections 350 et seq., or 375 et seq. The appropriate stage of water conservation and the shortage response action triggered by the stage is then declared in a public notification posted on the CBMWD website and published in a daily newspaper. Upon declaration by the Board that a water shortage emergency exists, the WSCP shall be implemented. The plan shall remain in effect until the Board declares the water shortage emergency has ended.

5.5.6 OTHER RELEVANT COMMUNICATION PROTOCOLS

To reduce water use consumption during any water shortage stage, CBMWD will increase its public education and outreach efforts to build awareness of needed actions from the public. Moreover, CBMWD will regularly revise its outreach campaign to reflect current supply conditions. Key communication strategies and associated water shortage stage implementation are listed below:

- Promote available water assistance resources for vulnerable populations; specialized outreach for impacted industries (Stages 3 and 4).
- Keep stakeholders and aware of conditions (all Stages).

- Proclaim stage change to key stakeholders and the general public (all Stages).
- Conduct meetings with elected officials and other key civic and business leaders (Stage 2).
- Encourage reduced optional outdoor use through outreach (Stages 3 and 4).

CBMWD may implement these communication strategies through its newsletters, website, and social media platforms to reflect supply conditions. In addition, CBMWD may conduct news briefings or other media outlets (i.e., TV, radio, newspapers) to announce changes in supply conditions.

5.5.7 CRISIS COMMUNICATION PROTOCOL

In the event of a catastrophic supply interruption due to a natural disaster or damage to CBMWD's facilities, CBMWD will implement communication procedures in accordance with local, regional, state, and federal emergency response guidelines as outlined in its ERP. Depending upon the severity of the emergency and potential damage to CBMWD's facilities, CBMWD may determine that it is necessary to utilize the Standardized Emergency Management System (SEMS) response and the Incident Command System (ICS). Public information and crisis communication are an integral part of the ICS structure. National Incident Management System (NIMS), SEMS, and ICS have been integrated into the ERP. It provides for a strategic response by all employees and assigns specific responsibilities in the event the plan is activated.

In general, communications during an emergency response will proceed along the chain of command of the SEMS/ICS. The number of people notified will increase as the incident expands and decrease as the incident contracts toward its conclusion.

The type and extent of the disaster will dictate the normal and/or alternative methods of communication that will be used. It is anticipated that employees will know upon arrival at their duty stations which communication systems are functional, and which are not.

When an incident occurs interrupting supply, the General Manager will go to the designated EOC and begin implementation of CBMWD procedures and employ appropriate strategies from the shortage stages in **Table 8.8**

Crisis communication efforts will concentrate on providing information to the public and external audiences. Furthermore, outreach messaging will reflect emergency conditions and the need to focus on health and public safety. CBMWD will keep the Board of

Directors informed of incident status and coordinate with public health officials.

CBMWD will maintain communication with its wholesaler and its member agencies. In addition, CBMWD may also authorize release of public information to news media to announce conditions and explain needed action. Finally, CBMWD will ensure ongoing coordination with emergency response services with daily advisories or alerts as needed.

5.6 COMPLIANCE AND ENFORCEMENT

5.6.1 PENALTIES OR CHARGES

Although CBMWD has its drought ordinance that identifies wasteful uses of water, CBMWD is not in a position to directly control retail water use through penalties or charges. Thus, CBMWD has not developed penalties or charges related to wasteful water use, has established an appeals process for member agencies exceeding the allocation set forth by the CBMWD WSAP.

5.6.2 ALLOCATION APPEAL

CBMWD WSAP Process

If any agency should exceed its allocated amount, be it planned or unexpected, an appeal must be submitted to CBMWD. The appeal request must include:

- A designated staff person to serve as point of contact.
- The type of appeal (erroneous baseline data, loss of local supply, etc.).
- The quantity (in AF) of the appeal.
- A justification for the appeal which includes supporting documentation.

Once received, CBMWD will then submit the appeal request to MWD which will then go through their appeals process.

MWD WSAP Process

The MWD appeals process steps are as follows:

1. Appeals Submittal
2. Notification of Response and Start of Appeals Process
3. Appeals Conference

4. Preliminary Decision/Recommendation
5. Clarification Conference
6. Final Decision/Recommendation
7. Board Notification/Action

Steps 4-7 differ depending on the size of the appeal. Small appeals are defined as those that would change CBMWD's allocation by less than 10 percent, or are less than 5,000 AF in quantity. Small appeals are evaluated and approved or denied by MWD staff. Large appeals are defined as those that would change CBMWD's allocation by more than 10 percent, and are larger than 5,000 AF. Large appeals are evaluated and approved or denied by the MWD Board of Directors. A minimum of 60 days is required to coordinate the appeals process with MWD's Board process.

5.7 LEGAL AUTHORITIES

Under California law, including CWC Chapter 3 (commencing with Section 350) of Division 1, Parts 2.55 and 2.6 of Division 6, Division 13, and Article X, Section 2 of the California Constitution, CBMWD shall implement the water shortage response actions outlined in this section with authorization of the CPUC. In all water shortage cases, shortage response actions to be implemented will be at the discretion of CBMWD and will be based on an assessment of the supply shortage, customer response, and need for demand reductions.

It is noted that upon proclamation by the Governor of a state of emergency under the California Emergency Services Act, Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code, based on drought conditions, the state will defer to implementation of locally adopted water shortage contingency plans to the extent practicable. CBMWD will coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

5.8 FINANCIAL CONSEQUENCES OF WSCP IMPLEMENTATION

As water consumption decreases, the revenue generated through water sales also decreases. To continue operation, CBMWD will need to generate sufficient revenue when faced with decreasing water sales revenue. Based on CBMWD's total water revenue and operating expenses, demand reductions will result in negative net cash provided by operating activities.

To offset financial loss due to a water shortage, CBMWD will implement its tiered water rates and surcharges. A reduction in water consumption will likely result in loss of revenues needed to maintain and operate the water system. A combination of the measures outlined in **Tables 5.9** and **5.10** may be used to offset or diminish the effects of lost revenues and expenditure costs.

Table 5.9: CBMWD Measures to Overcome Revenue Impacts

Name of Measures
Emergency Reserve Fund
Rate Structure Adjustment
Tiered Rate Structure Adjustments

Table 5.10: CBMWD Measures to Overcome Expenditure Impacts

Name of Measures
Implement Various Surcharges: <ul style="list-style-type: none"> 1. Administrative 2. Infrastructure 3. Water Service 4. CBMWD's Capacity
Delay capital improvement projects
Consider temporary increase of water rates to meet operation and maintenance costs

5.9 WSCP ADOPTION AND REFINEMENT PROCEDURES

5.9.1 WSCP PUBLIC NOTICE AND ADOPTION

To encourage broad community participation in the WSCP preparation process, CBMWD provided 60-day notification letters to agencies within CBMWD's service area. Copies of the draft WSCP were made available for public review at the CBMWD Office and website prior to the public hearing. Shortly before the public hearing, a two-week and a one-week

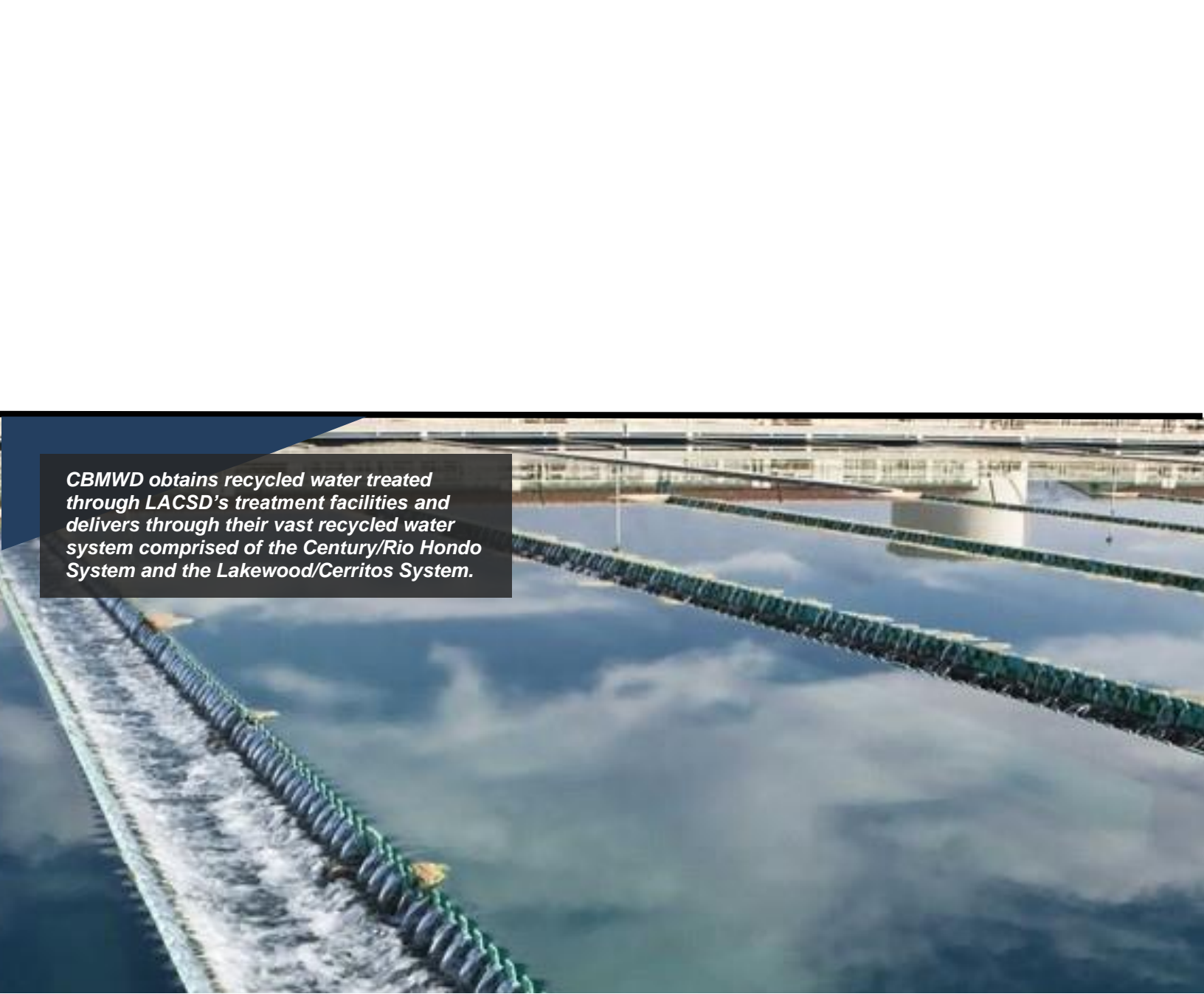
notice was published in the local press alerting the public of the public hearing. At a subsequent board meeting following the public hearing, CBMWD's final WSCP was approved and adopted by its Board of Directors on **June 28, 2021**. **Appendix E** contains the Board resolution adopting the WSCP. The final plan was submitted to DWR within 30 days of Board adoption and includes all information necessary to meet the requirements of CWC Section 10632.

By **June 30, 2021**, CBMWD's approved WSCP was filed with DWR. By **July 1, 2021**, CBMWD's plan was submitted to the California State Library, County of Los Angeles, and cities within its service areas. CBMWD will make the plan available for public review no later than 30 days after filing with DWR.

5.9.2 WSCP REFINEMENT PROCEDURES

This section discusses the process for reviewing and updating the WSCP to ensure it remains actively used, relevant and appropriate to the community, and consistent with applicable state and requirements. It is vital that CBMWD's WSCP remain up to date so as to best ensure shortage risk tolerance is adequate, appropriate water shortage mitigation strategies are implemented as needed, proper procedures for water efficient practices are in place for the community, and better alignment with long-term water use goals.

The CBMWD Water Resources Department is responsible for maintaining this plan and updating it as needed. The General Manager is the primary CBMWD staff member who will carry out this process. In addition, the Management Analyst, or their designee, will serve as the WSCP project manager and will coordinate maintenance of the plan, conduct the formal review process, and direct the plan updates. The project manager will assign tasks, which may include collecting data, developing new or updated water shortage mitigation measures, updating sections of the plan, and presenting the plan to others.



CBMWD obtains recycled water treated through LACSD's treatment facilities and delivers through their vast recycled water system comprised of the Century/Rio Hondo System and the Lakewood/Cerritos System.

SECTION 6: RECYCLED WATER

CENTRAL BASIN MUNICIPAL WATER DISTRICT | 2020 URBAN WATER MANAGEMENT PLAN



SECTION 6

RECYCLED WATER

6.1 OVERVIEW

Recycled water is defined as domestic wastewater purified through primary, secondary and tertiary treatment. The Southern California region, from Ventura to San Diego, discharges over 1 billion gallons of treated wastewater to the ocean each day. Since recycled water is acceptable for a variety of non-potable water purposes such as irrigation, groundwater recharge, and commercial/industrial processes, it is considered a reliable and drought-proof water source and could greatly reduce the region's reliance on imported water. As technological improvements continue to reduce treatment costs, and as public perception and acceptance continue to improve, more reuse opportunities should develop, which will increase demands for recycled water. Recycled water is a critical part of the California water picture because of the area's high likelihood of drought. As part of its overall water resources planning, CBMWD continues to investigate the feasibility and cost-effectiveness of using recycled water.

6.2 AGENCY OVERVIEW

Recycled water is the basis of CBMWD's efforts to augment local supplies and reduce dependence on imported water. Planning and construction of CBMWD's recycled water system began in the early 1990's. Recycled water is used where economically feasible for non-potable applications such as landscape irrigation, commercial and industrial processes such as cooling, and indirect potable reuse through groundwater replenishment.

An overview of CBMWD's water recycling system including treatment and distribution, past, current and projected sales and system expansion projects. The Cities of Cerritos and Lakewood have recycled water programs within the CBMWD service area.

6.3 RECYCLED WATER SOURCES AND TREATMENT

6.3.1 CBMWD'S SOURCE WATER

The source of CBMWD's recycled water comes from LACSD treated wastewater. Central Basin does not collect or treat its municipal wastewater. LACSD operates six water

reclamation plants (WRPs) in the Los Angeles Basin producing approximately 593 MGD of secondary effluent. Approximately one-third of the secondary effluent undergoes additional treatment for non-potable uses such as recycled water.

CBMWD purchases a portion of this recycled water from the Los Coyotes WRP and the San Jose Creek WRP. These plants provide approximately 137 MGD of Title 22 tertiary treated water for distribution. Under the March 11, 2015 Agreement for Purchase and Sale of Recycled Water with LACSD, CBMWD is allotted 20.54 MGD (23,000 AFY) of recycled water through 2017, but the allotment will decrease to 9.38 MGD (10,500 AFY) after 2017. CBMWD has never exceeded 5.27 MGD (5,900 AFY). LACSD looks to beneficially reuse all of its recycled water and the Agreement with CBMWD reflects a reasonable growth margin to allow for increases in demand and new customers. A detailed description of the two WRP's are provided below.

San Jose Creek Water Reclamation Plant

The San Jose Creek WRP is located in unincorporated Los Angeles County adjacent to the City of Whittier. The San Jose Creek WRP was built in the early 1970's and serves a large residential population of approximately one million people. The WRP has a wastewater treatment capacity of 100 MGD and approximately 62.52 MGD of recycled water is produced for use at locations throughout the region.

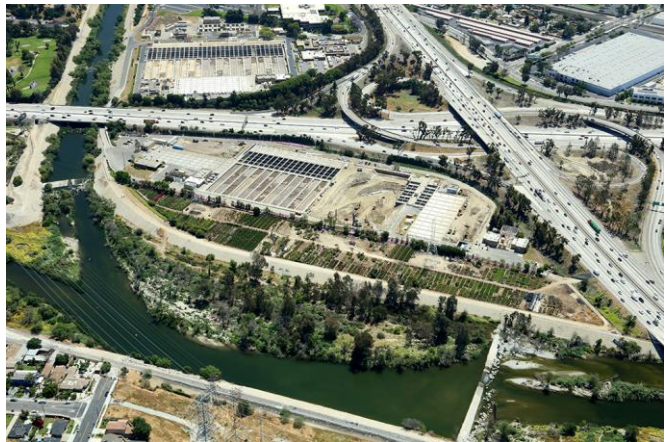


Figure 6.1: San Jose Creek Water Reclamation Plant

Over 130 sites are served that provide groundwater recharge at the San Gabriel River and Rio Hondo Spreading Grounds as well as irrigation of parks, schools and greenbelts. In FY 18 – 19, approximately 36 MGD of the recycled water from San Jose Creek WRP was sent to recharge the Central Basin groundwater aquifer

Los Coyotes Water Reclamation Plant

The Los Coyotes WRP is located in Cerritos serving a population of 370,000 people. The WRP has a wastewater treatment capacity of 37.5 MGD and produces approximately 21.20 MGD of recycled water that is used at over 270 sites throughout the region. The recycled water provides irrigation for schools, golf courses, parks, nurseries and greenbelts as well as industrial use at local companies for carpet dying and concrete mixing.

The amount of wastewater collected and treated by the two WRP's is expected to remain relatively consistent during the next 20 years despite population increases. According to LACSD analysis, population increases are not projected to be significant enough to make it economically feasible to expand the WRP's. Since 1999, LACSD's effluent has been decreasing annually due to conservation efforts and economic

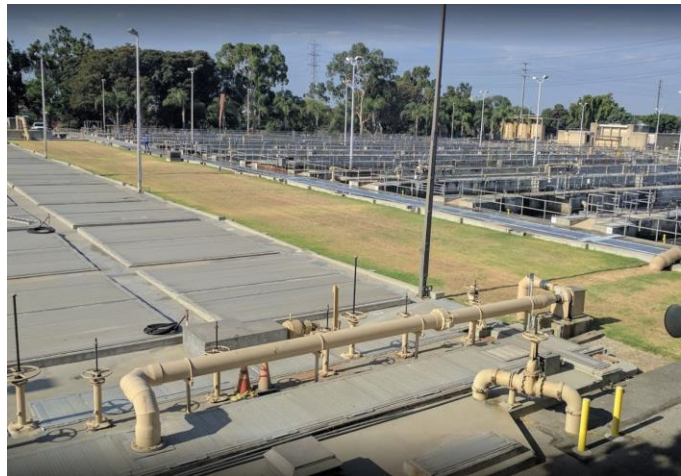


Figure 6.2: Los Coyotes Water Reclamation Plant

conditions. Based on LACSD's "FY 2018 - 19 Annual Report on Recycled Water", the San Jose Creek WRP is treating wastewater at approximately 56 percent below the plant capacity and the Los Coyotes WRP is treating wastewater at approximately 50 percent below its capacity. CBMWD does not directly treat or discharge any wastewater as they are a wholesaler.

Generally, CBMWD provides irrigation to parks, golf courses, schools, nurseries, freeway and street medians, slopes, and other greenbelt areas. Various industries, such as the Shaw-Tufted Carpet Mill use recycled water for carpet and textile dyeing, metal finishing, concrete mixing, cooling tower supply, and other process water use. Industrial uses include but are not limited to concrete mixing (Robertson's Ready-Mix in Paramount and Santa Fe Springs), sand mold manufacturing process (Pacific Alloy Castings in South Gate), cooling plant operations at co-gen facilities (Metropolitan State Hospital in Norwalk), and power plant cooling (Malburg Power Plant in Vernon).

6.3.2 TREATMENT PROCESS

Recycled water undergoes a multi-stage treatment process that produces high quality water that meets the DDW Title 22 standards. Title 22 standards address specific treatment requirements for each type of beneficial reuse. Approximately 2,000 tests are performed monthly to ensure water quality meets all State and Federal requirements.

The recycled water produced at the San Jose Creek and the Los Coyotes WRP's undergoes tertiary treatment and denitrification. Tertiary treatment provides additional treatment to secondary effluent with coagulation, filtration and disinfection. Tertiary treated water can be used for a wide variety of industrial, commercial, and irrigation purposes where high-quality, non-potable water can be used.

6.4 RECYCLED WATER SYSTEM

6.4.1 CENTURY / RIO HONDO SYSTEM

CBMWD's regional water recycling program is comprised of two distribution systems: E. Thornton Ibbetson Century Water Recycling Project (Century Distribution System) and the Esteban Torres Rio Hondo Water Recycling Project (Rio Hondo Distribution System). These distribution systems are interconnected to operate as one recycled water supply system to deliver recycled water for landscape irrigation, commercial, and industrial uses throughout the CBMWD service area.



Figure 6.3: Rio Hondo Pump Station in Pico Rivera, CA

CBMWD's recycled water system is comprised of over 80 miles of pipeline with diameters ranging from 4-inch to 48-inch pipelines, three pumping stations owned by CBMWD, one pump station owned by the City of Cerritos, and service laterals. **Figure 6.4** shows a map of CBMWD's Recycled Water system.

The Century Distribution System began delivering recycled water in 1992. The system currently delivers tertiary treated recycled water from LACSD's Los Coyotes WRP and serves the Cities of Bell, Bellflower, Bell Gardens, Compton, Cudahy, Downey, Lakewood, Huntington Park, Lynwood, Norwalk, Paramount, Santa Fe Springs, South Gate, and Vernon.

In 1994, the Century Distribution System was extended into the northern portion of CBMWD's service area. The extension, known as the Rio Hondo Distribution System, delivers tertiary treated recycled water from LACSD's San Jose Creek WRP and serves the Cities of Pico Rivera and Whittier in addition to all cities by the Los Coyotes WRP.

In FY 2019-20, CBMWD's recycled water system delivered approximately 4,492 AF of water for non-potable uses. Over the next 25 years it is anticipated that CBMWD will increase its sales with new connections. CBMWD works toward connecting new customers to its recycled water system every year to further reduce demands on imported potable water.

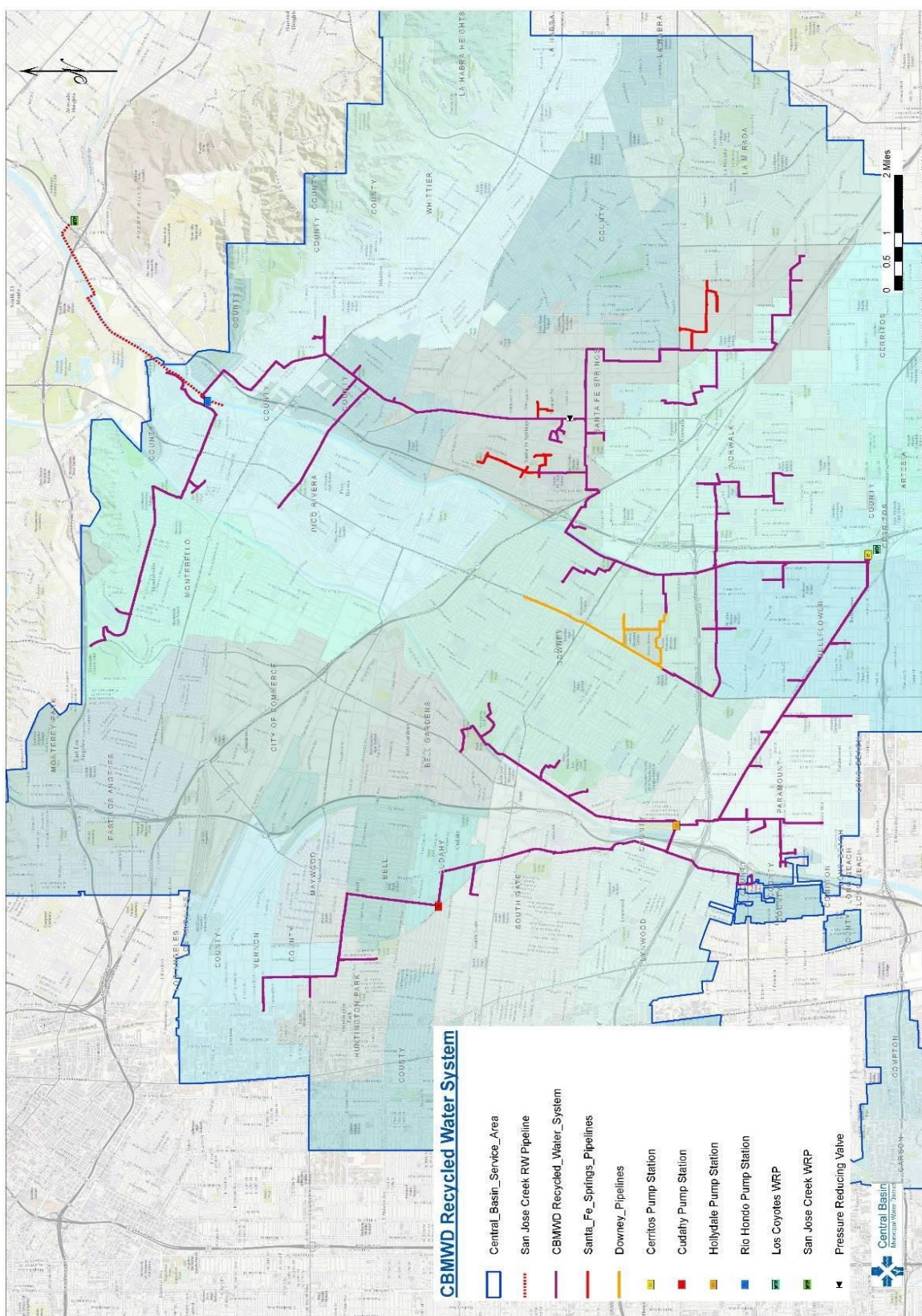


Figure 6.4: CBMWD Recycled Water System Map

6.4.2 CITY OF CERRITOS

The City of Cerritos has had its own water recycling system since 1988. This 25-mile system has saved Cerritos approximately \$6 million in water costs with an initial investment of approximately \$9 million. Even though the Cerritos system is not interconnected with CBMWD's system, Cerritos is an important partner because CBMWD's system shares the Cerritos Pump Station for a portion of its recycled water supply from LACSD's Los Coyotes WRP. The Cerritos system serves on average 2,500 AFY, of which 500 AFY goes to the City of Lakewood, to approximately 230 customers within the two cities. Recycled water makes up approximately 13 percent of their total water supply portfolio.

6.4.3 CITY OF LAKEWOOD

The City of Lakewood purchases on average 500 AFY of recycled water from the City of Cerritos to offset potable water demand.

6.4.4 WATER REPLENISHMENT DISTRICT (WRD)

WRD has been purchasing recycled water from LACSD to blend with imported water and stormwater within the recharge basins of LACDPW. LACDPW owns and operates the recharge facilities, while WRD purchases the recycled water for blending and Groundwater Basin recharge. Under the conditions of the regulatory permit from the Los Angeles Regional Water Quality Control Board, WRD was limited to spreading 35 percent recycled water over a five-year period based on the total inflow of all waters (stormwater, imported water, and recycled water) entering the Montebello Forebay. Groundwater replenishment is projected to be 50,000 AFY by 2030.

In April 2014, a WRD permit was amended to increase recycled water storage for the Montebello Forebay Groundwater Recharge Project (Rio Hondo and San Gabriel Spreading Grounds) to increase the use of recycled water from 35 percent to 45 percent, potentially saving 13,150 gallons per day of imported water, enough to supply 30 households for a year (15 AFY).

WRD pursues projects through its Water Independence Now program that develops local, sustainable water sources for use in groundwater replenishment. This has become increasingly important with the issues that have limited imported water deliveries to Southern California, as well as drought conditions.

The Groundwater Reliability Improvement Program (GRIP) evaluated alternative supply sources to imported water that could replenish the Montebello Forebay. After evaluation, the selected alternative will use advanced treated municipal wastewater that undergoes microfiltration, reverse osmosis, and ultraviolet light with hydrogen peroxide for disinfection. The project will deliver the 10,000 AFY of advanced treated water from a new facility and 11,000 AFY of tertiary treated recycled water from LACSD's San Jose Creek WRP to the San Gabriel River spreading basins to meet a portion of WRD's replenishment requirements. The advanced water treatment facility will be located in the City of Pico Rivera. Preliminary studies, preparation of environmental documents, and outreach has been completed and the GRIP project is currently going through procurement.

6.4.5 RECYCLED WATER USE

Landscape irrigation constitutes about the majority of CBMWD's current recycled water use; therefore, water sales are highly impacted by rainfall in the region. The amount of recycled water supplied by CBMWD from FY 2005-20 has totaled more than 70,800 AF. CBMWD anticipates recycled water sales to increase in the future as more customers switch from potable water to recycled water due to the supply reliability and the economic incentives associated with converting from potable to recycled water.

Recycled water sales peaked between FY 2006-08 and again between FY 2012-15. The FY 2012-15 peak took place during a multi-year drought; however, after the FY 2012-15 peak, Recycled water sales declined with a minor spike in FY 2018. CBMWD still anticipates large increases in sales over the next five to ten years with completion of capital improvement projects that expand the system along with connections to new customers throughout the service area. **Table 6.1** shows CBMWD Recycled Water System's annual sales from FY 2015 to FY 2020.

Table 6.2 shows CBMWD Recycled Water System's projected recycled water use for 2020 from the 2015 UWMP compared to actual 2020 use. The actual 2020 use was lower than that projected from 2015.

Table 6.1: CBMWD Recycled Water Sales (AF) to Retail Agencies (FY 2015–2020)

Retail Agency	Fiscal Year Ending					
	2015	2016	2017	2018	2019	2020
Bellflower Municipal	11	10	9	11	8	8
Bellflower-Somerset Mutual Water Co	127	119	121	117	94	95
California Water Service – East LA	-	-	-	-	17	34
City of Cudahy	7	4	3	3	3	2
City of Downey	738	671	747	815	693	647
Golden State Water Company	381	325	398	420	349	396
City of Huntington Park	42	51	82	399	41	43
Los Amigos Golf Course	225	213	198	210	174	182
City of Lynwood	18	8	17	31	53	37
City of Montebello	-	-	-	-	32	218
Montebello Land & Water Co	-	-	-	5	15	9
City of Norwalk	80	75	71	82	74	67
City of Paramount	287	334	330	368	299	315
Liberty Utilities	248	200	252	324	266	258
City of Pico Rivera	107	69	168	86	73	74
Pico Water District	40	47	56	63	64	56
San Gabriel Valley Water Co	129	128	177	143	116	122
City of Santa Fe Springs	986	924	881	904	966	846
City of South Gate	185	184	162	249	199	247
Upper San Gabriel Valley MWD	657	435	48	51	46	42
City of Vernon	813	790	742	601	622	734
City of Whittier	81	55	75	63	62	60
City of Cerritos	1,898	1,742	1,590	2,012	1,714	1,778
City of Lakewood	491	482	479	500	386	447
TOTAL	7,615	6,866	6,606	7,456	6,367	6,717

Table 6.2: 2015 UWMP Recycled Water Use Projection Compared to 2020 (DWR Table 6-5 Wholesale)

Name of Receiving Supplier or Direct Use by Wholesaler	2015 Projection for 2020	2020 Actual Use
Municipal, Industrial, and Agricultural Use	8,934	6,717
Total	8,934	6,717

6.4.6 PROJECTED RECYCLED WATER SALES

Recycled water within CBMWD’s service area is projected to increase from its current sales as the system continues to expand. **Table 6.3** shows current and projected recycled water sales through 2045. Amounts projected for Groundwater Replenishment is recycled water purchased by WRD directly from LACSD to be injected into the Montebello Forebay.

**Table 6.3: Current and Projected Retailers Provided Recycled Water Within Service Area
(DWR Table 6-4 Wholesale)**

Name of Receiving Supplier or Direct Use by Wholesaler	Level of Treatment	2020	2025	2030	2035	2040	2045
Municipal, Industrial, and Agricultural Use	Tertiary	6,717	6,759	6,928	7,101	7,279	7,461
GW Recharge / Montebello Forebay	Tertiary	53,988	54,579	55,944	57,342	58,776	60,245
Total		60,705	61,338	62,872	64,443	66,055	67,706
NOTES: Municipal, Industrial, and Agricultural Use includes RW from the CBMWD RW System and the Cities of Cerritos and Lakewood.							

6.5 POTENTIAL RECYCLED WATER USE

Recycled water use is expected to increase among cities, water agencies and businesses/industries. The increasing cost of imported water makes recycled water more desirable. CBMWD will continue to pursue cost effective projects within its service area and in partnership with neighboring agencies. Efforts are currently focused on expanding the existing regional system that CBMWD receives an incentive payment from MWD for every AF delivered up to 23,000 AFY through 2017.

Although there is potential to increase recycled water use in CBMWD, there are challenges and limitations to connect new customers. These challenges include proximity to recycled water pipelines, capacity and pressure required to serve each customer, and potable to recycled water conversion costs. These challenges play a significant role in the growth of recycled water and the ability to connect new customers which dictates when and how much recycled water will be used in the future.

In 2012, the Master Plan identified and prioritized areas within CBMWD's service area where recycled water has the potential to expand. Although the Master Plan is currently being updated and could influence CBMWD's near and long-term projections, the goal to maximize recycled water use throughout the service area will not change. Partnerships with neighboring agencies have already resulted in projects that expand the CBMWD system and sales beyond its service area limits.

6.5.1 CARSON ADVANCED WATER TREATMENT PLANT

With changing conditions in the CRA and SWP supplies, imported water has continued to be restricted. In order to maintain a sustainable water supply for Los Angeles and

surrounding communities, MWD is determining the feasibility of advanced water treatment of wastewater to be used for groundwater recharge in order to offset a portion of MWD's imported water demand. MWD has partnered with LACSD since 2010 to determine the potential demands, technical and regulatory constraints of indirect potable reuse (IPR), and to estimate costs associated with the system (MWD Board of Directors Special Committee on Desalination and Recycling, March 2010). LACSD's "Status Report on Recycled Water from 2010-2011" presented the advanced water treatment concept as a 200 MGD (224,110 AFY) facility but has since been revised. Pilot scale testing of treatment systems for the demonstration facility went underway in 2010 with a \$33,000 grant from the United States Bureau of Reclamation at LACSD's Joint Water Pollution Control Plant (JWPCP) in the city of Carson. **Figure 6.5** shows the JWPCP existing site outlined in yellow, the demonstration facility site, and the proposed location of a full-scale plant outlined in red.



Figure 6.5: LACSD Joint Water Pollution Control Plant (JWPCP) in Carson, CA

On September 21, 2015, MWD representatives presented the "Potential Regional Recycled Water Supply Program" to the Board's Water Planning and Stewardship Committee. The presentation detailed the potential to develop a water supply to recharge groundwater basins and increase the regions water supply portfolio with IPR similar to the Orange County Water District's Groundwater Replenishment System. The program would involve a multi-phased approach with an initial 1 MGD demonstration plant, feasibility studies for

full scale facilities, and a financing plan followed by several incremental phases of full-scale facilities up to 150 MGD. The full-scale facility would produce up to 150 MGD of advanced treated water that would be injected into groundwater basins throughout the Los Angeles region, as shown on **Figure 6.6**.

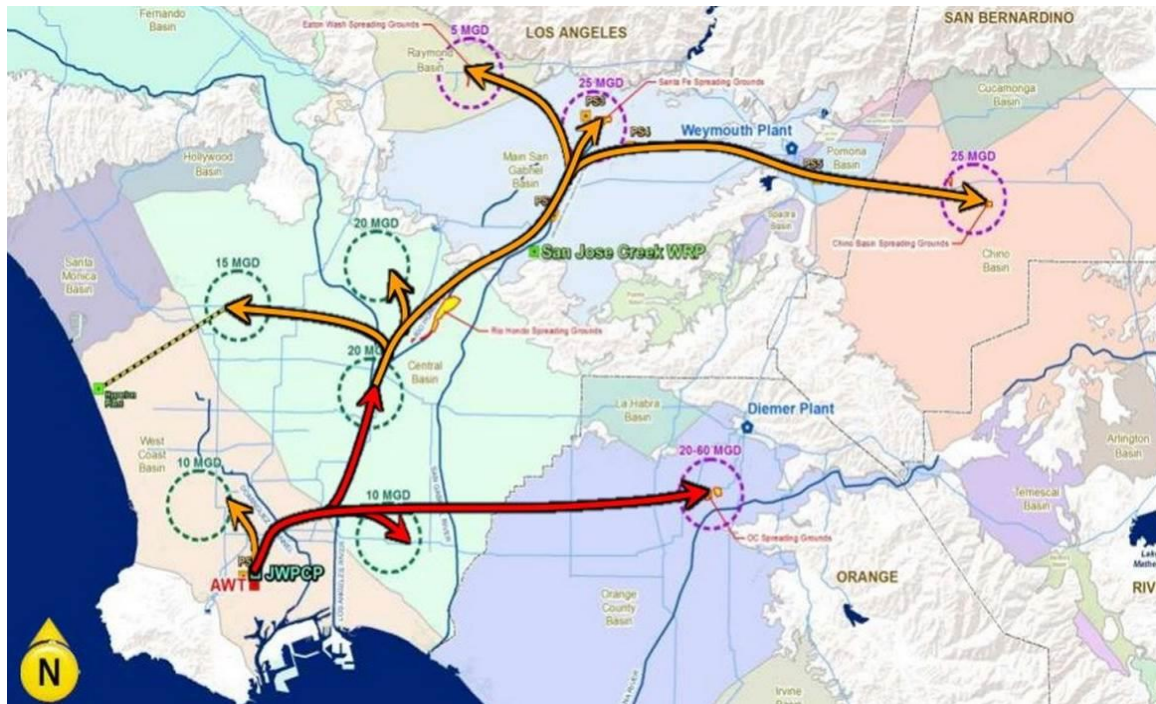


Figure 6.6: MWD's Potential Full Scale Recycled Water Program

6.5.2 SGVMWD'S RECYCLED WATER FEASIBILITY STUDY

In 2017, San Gabriel Valley Municipal Water District (SGVMWD) conducted the "San Gabriel Valley Regional Recycled Water Supply Program Feasibility Study" that analyzed potential ways for SGVMWD's member agencies (Azusa Light and Water, and the cities of Alhambra, Monterey Park, and Sierra Madre) obtain and utilize recycled water within their service areas. Of those four member agencies, the cities of Alhambra and Monterey Park have the potential to receive recycled water based on the feasibility study.

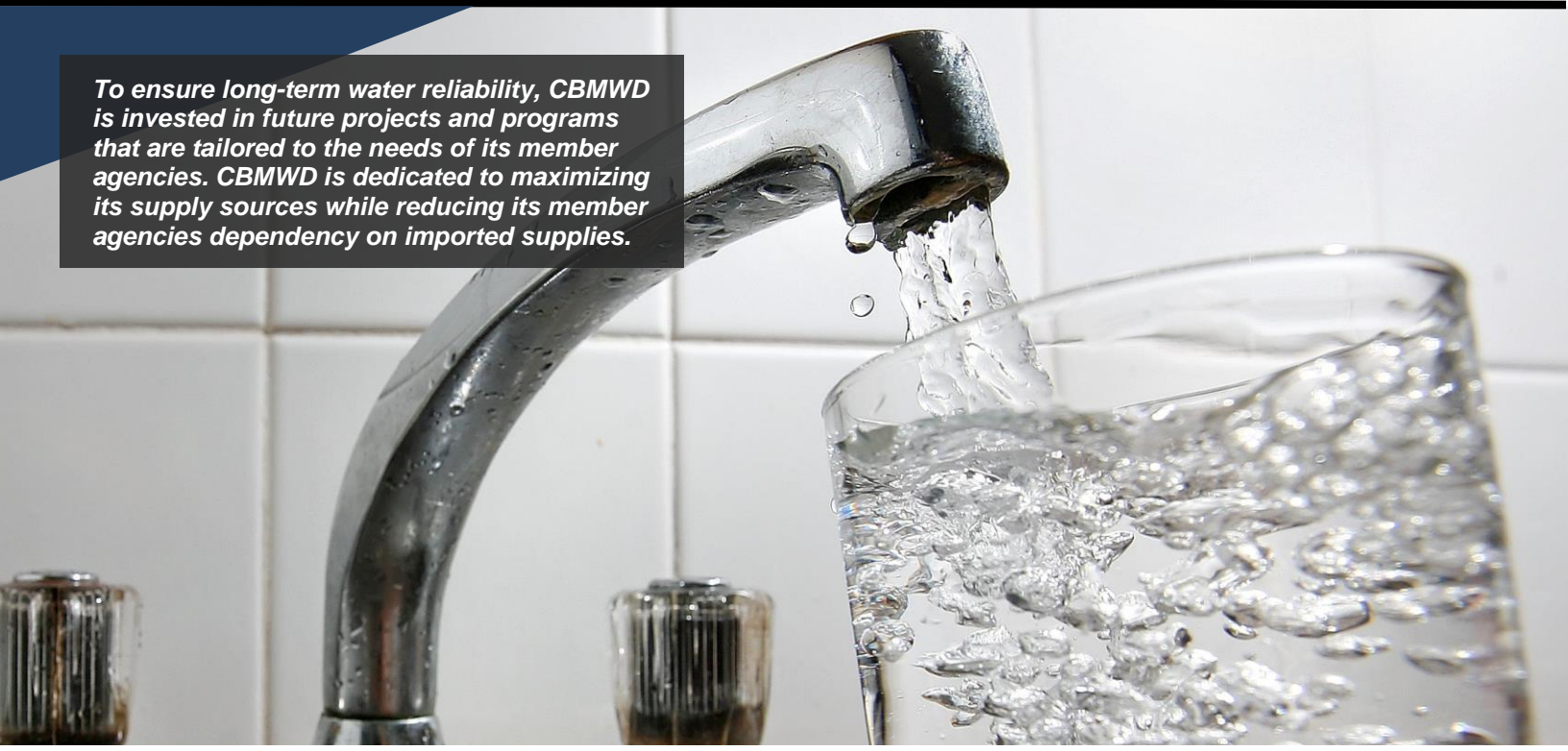
City of Monterey Park

The City of Monterey Park can obtain recycled water through existing CBMWD recycled water mains near the Montebello Country Club. Recycled water would be supplied by CBMWD which originated from SJCWRP. Connection to CBMWD's main would require a two-phase project with CBMWD to expand their facilities. Potential users comprised of one (1) school, and one (1) commercial/industrial application, approximating a total demand of 1,150 AFY. The potential projects will require 79,807 feet of pipeline, three (3) pumps, and

one (1) recycled water reservoir. In 2017, the system was estimated at \$30.2 million.

City of Alhambra

The City of Alhambra can obtain recycled water through the two-phase CBMWD expansion project mentioned previously for the City of Monterey Park. Potential users comprised of (8) schools, four (4) parks, three (3) industrial applications, four (4) irrigation applications, one (1) laundry facility, one (1) golf course, and one (1) car wash, which equates to an approximate total demand of 1,675 AFY. The potential project will require 49,301 feet of pipeline, three (3) pumps, and was estimated to have a cost of \$14.3 million in 2017.



To ensure long-term water reliability, CBMWD is invested in future projects and programs that are tailored to the needs of its member agencies. CBMWD is dedicated to maximizing its supply sources while reducing its member agencies dependency on imported supplies.

SECTION 7: FUTURE SUPPLY PROJECTS & PROGRAMS

CENTRAL BASIN MUNICIPAL WATER DISTRICT | 2020 URBAN WATER MANAGEMENT PLAN

SECTION 7

FUTURE WATER SUPPLY PROJECTS & PROGRAMS

7.1 OVERVIEW

In general, CBMWD actively reviews practices and monitors outside recycled water development and opportunities that will provide its customers with adequate and reliable supplies. As discussed in previous sections, CBMWD is dedicated to maximizing its supply sources while reducing its member agencies dependency on imported supplies. This section discusses planned and potential future water supply projects and programs, while updating existing plans from 2015 as well as presenting new plans.

7.2 MWD REGIONAL SUPPLY PROJECTS & PROGRAMS

MWD is implementing water supply alternative strategies for the region and on behalf of member agencies to ensure available water in the future, including:

- Conservation
- Water recycling & groundwater recovery
- Storage and groundwater management programs within the region
- Storage related to SWP & CRA
- Other water supply management programs outside of the region

MWD has made investments in conservation and supply augmentation as part of its long-term water management strategy. MWD's approach to a long-term water management strategy was to develop an IRP to include diversified supply sources.

MWD is currently updating its IRP; however, that process will not be completed until after submittal of this UWMP. The IRP projects demands and identifies a mix of supplies to meet those demands. These supplies include desalination, recycling, conservation, brackish groundwater recovery and conjunctive use. MWD has financial incentive programs in place for local agencies to develop these supplies. CBMWD, as a member agency of MWD,

supports these incentive programs and contributes to these financial incentives through its payments for water from MWD.

7.2.1 WATER MANAGEMENT TOOLS

Public education regarding conservation has been the predominant water management tool. Various forms of outreach are used including having conservation booths at community events, tours for students and landscape classes. Through an MWD-funded and member agency-administered program, CBMWD has also provided rebates for items such as hot water recirculation systems and cisterns.

7.2.2 TRANSFER OR EXCHANGE OPPORTUNITIES

Water transfers and exchanges are management tools to address increased water needs in areas of limited supply. Although transfers and exchanges do not generate a new supply of water, they help distribute water from where it is abundant to where it is limited.

MWD has played an active role statewide in securing water transfers and exchanges as part of their IRP goals in both the Colorado River Basin and along the SWP. As a member agency of MWD, CBMWD is the beneficiary of such transfers and exchanges.

7.3 PLANNED WATER SUPPLY PROJECTS AND PROGRAMS

It has been part of CBMWD's Capital Improvement Projects Plan and Five (5) Year Recycled Water Facilities Plan (Recycled Water Master Plan) to expand the existing recycled water distribution system. Past drought conditions, new regulations, and available funding through Proposition 1 have accelerated CBMWD's expansion efforts. Projects included in the Preliminary Capital Improvement Projects Plan are described below.

7.3.1 CURRENT RECYCLED WATER SUPPLY PROJECTS

West San Gabriel Recycled Water Expansion Project

CBMWD, Montebello Land Company, City of Montebello, San Gabriel Valley Water Company, and the City of Monterey Park are looking to construct a pipeline to bring recycled water supply into northern area of the City of Montebello, City of San Gabriel, and the City of Monterey Park.

The recycled water pipeline will extend from the existing CBMWD system in the City of Montebello. Currently, confirmed annual recycled water demand is estimated to be 800 AFY, including temporary irrigation estimated to be 200 AFY. Additional recycled water connections and demand estimated as 1,500 AFY are currently being investigated and will influence final pipe diameters and length. Final design diameter for the pipeline will be between 16 inches and 30 inches in diameter. The present design, for confirmed demands in the amount of 800 AFY, consist of 16-inch diameter piping for 20,500 (3.8 miles) linear feet. A pump station and master meter will also be constructed for this project.

Phase 1 and phase 2 will bring a 16-inch to 30-inch diameter pipeline approximately 7,500 linear feet up to points of connection for the Montebello Hills Specific Plan, Montebello Town Center, and the Shops at Montebello. Phase 3 will extend a 16-inch to 30-inch diameter pipeline north 5,500 linear feet to serve Resurrection Cemetery and additional sites currently being investigated. Phase 3 will extend the pipeline an additional 7,000 linear feet to serve additional sites out of CBMWD's service area. Additional pipeline alignments may be added to connect additional sites.

In early 2021, CBMWD connected the Montebello Hills project. For the rest of 2021, recycled water will be used for dust suppression at a flow of 1,200 to 1,800 gpm for 10 hours per day at 5 days per week. Once dust suppression is completed, that system will be utilized for irrigation of common space and parks.

La Mirada Recycled Water Expansion Project

It has been part of CBMWD's Capital Improvement Projects Plan and Five (5) Year Recycled Water Facilities Plan (Recycled Water Master Plan) to expand the existing recycled water distribution system. Current drought conditions, new regulations, and available funding through Proposition 1 have accelerated CBMWD's expansion efforts.

A recycled water project CBMWD is currently looking to fast-track is the La Mirada Recycled Water Expansion Project. CBMWD already has a willing city (La Mirada) and a willing retail water agency (Suburban Water Systems) to provide the support necessary to make the project viable.

CBMWD is planning to expand the existing recycled water distribution system in south Santa Fe Springs into La Mirada to pick up several large landscaped facilities including La Mirada Park, La Mirada Golf Course, La Mirada High School, Olive View Cemetery, Biola University, La Mirada City Buildings, Behringer Park, and many more recycled water sites that are currently being investigated. The number of potential recycled water customer connections is estimated to be around 24 sites. These sites are estimated to use a cumulative

total of approximately 900 AFY of potable water for landscape irrigation. Facilities needed consist of approximately 9,100 linear feet of 8-inch diameter piping; 10,100 linear feet of 12-inch diameter piping; and 20,900 linear feet of 16-inch diameter piping. The recycled water expansion would start by connecting to CBMWD's existing recycled water pipelines at Bonavista Avenue, continue east on Gannet Street, go north on Valley View Avenue, and then continue east through the most cost-effective route.

The design phase for this project has been completed, CBMWD is now looking for funding to begin construction.

Gateway Cities Recycled Water Expansion Project

CBMWD and the cities of South Gate, Bell Gardens, and Lynwood are looking into partnering to expand CBMWD's existing recycled water system into their cities to supply more sites with recycled water. Under a bundled project named the Gateway Cities project, submitted for Proposition 84 funding, the benefit will be providing 453 AFY of water savings and water quality improvement. This will be done by preparing planning, design, and environmental documentation for pipelines that will extend the CBMWD recycled water system. After completing this portion of the project, the partnering agencies plan to look to Proposition 1 funding for the design and construction of the project. The Project will provide 453 AFY of recycled water to irrigate 9 parks and schools, reducing the need for potable water supply at these facilities.

Bell Gardens

CBMWD and the City of Bell Gardens are looking to construct a pipeline to expand the recycled water supply into the city. The recycled water pipeline will extend from the existing CBMWD system located on Park Lane to sites located within the city. Currently, confirmed annual recycled water demand is estimated to be 90 AFY. CBMWD has an existing 16-inch pipeline on Park Lane before the cross section with Garfield Avenue. CBMWD plans to extend a 16-inch pipeline for approximately 2,950 linear feet along Garfield Avenue from Park Lane to Florence Place and a 12-inch pipeline for approximately 2,320 linear feet along Florence Place to Sudan Avenue to connect Suva Elementary School. The plan is to also add an 8-inch pipeline along Emil Avenue from Florence Place to connect Bell Gardens Park.

Lynwood

CBMWD and the City of Lynwood are looking into constructing a pipeline to expand the

recycled water supply into the city. The recycled water pipeline will extend from the existing CBMWD system located on Wright road to sites located within the city. Currently, confirmed annual recycled water demand is estimated to be 206 AFY. CBMWD has an 8-inch pipeline along Wright Road. CBMWD plans to extend a 12-inch pipeline for approximately 6,120 linear feet along Fernwood Avenue from Wright Road to Bullis Road and a 12-inch pipeline for approximately 1,800 linear feet along Bullis Road to connect Lynwood City Park, Linear Park, and Lynwood City Hall Complex.

South Gate

Currently, confirmed annual recycled water demand is estimated to be 236 AFY. Final design diameter for the pipeline will be between 8-inch and 12-inches. The current design for confirmed demands of 236 AFY, consist of 12-inch diameter piping for 14,000 linear feet and 8-inch diameter piping for 1,860 linear feet. The City of South Gate Recycled Water Line Extension will start with a 12-inch line from Burke Avenue to Alameda Street and will serve Firestone Boulevard Medians, South Gate Middle School, San Gabriel Avenue Elementary, South Gate High School, Willow Elementary School, the East Los Angeles Community Education Center, and the Alameda Street Commercial Industrial Development Complex. There will be an 8-inch line along California Avenue from City Place to Southern Avenue that will serve South Gate City Hall and Cesar Chavez State Park. The design phase for this South Gate project has been completed, and CBMWD is now looking for funding to begin construction.

Pico Rivera Mines Avenue Recycled Water Expansion Project

CBMWD is looking to construct a pipeline to expand the recycled water supply within the City of Pico Rivera. The recycled water pipeline will extend from the existing CBMWD system located on Mines Avenue to sites located within the city. Previous capital projects implemented a 12-inch and 8-inch recycled water lateral in Mines Avenue. Several potential sites require additional expansion to be connected and supplied recycled water. This project will connect the identified sites with estimated recycled water use of 275 AFY.

Additional construction needed for the previous Mains Avenue Phase 1B Project is a 6-inch to 8-inch diameter recycled water lateral extending from Mines Avenue for 5,700 linear feet.

City of Downey Recycled Water Expansion Project

CBMWD and the City of Downey are looking to construct a pipeline to expand the recycled

water supply into the city. The recycled water pipeline will extend from the existing CBMWD system located on Garfield Avenue to sites located within the city.

Currently, recycled water demand is estimated to be 125 AFY. CBMWD currently has a 12-inch pipeline along a public alley and Garfield Avenue. CBMWD plans to extend a 16-inch diameter pipeline for approximately 2,250 linear feet along south boundary of Los Amigos Golf Course and Quill Drive from Garfield Avenue and Gladys Street to Old River School Road in order to connect Rancho Los Amigos Medical Center. Subsequently, to connect Apollo Park, CBMWD plans to extend a 12-inch pipeline for approximately 2,810 linear feet along Quill Drive from Old River School Road to the east side of Apollo Park.

Bundling this project with two other non-disadvantaged communities, such as the City of Pico Rivera and the City of Santa Fe Springs, for Proposition 1 grant funding is currently being investigated.

Pico Rivera North Recycled Water Expansion Project

This project expands the recycled water system into north of Pico Rivera. Water services within the City of Pico Rivera is served by three water purveyors:

- 1) City of Pico Rivera; 2) Pico Water District; and, 3) The San Gabriel Valley Water Company. Water is additionally conveyed to the Rio Hondo Spreading Grounds and San Gabriel Spreading Grounds in Pico Rivera. Recycled water demand is approximately 150 AFY.

The expansion on the Northern portion of the service area consists of approximately 3,000 linear feet of pipeline construction. Project costs are estimated at \$875,000 for the 3,000 linear feet of pipeline construction. Planning, Design, Environmental, and Project/Construction Management are estimated at 2.5 percent, 7 percent, 2 percent and 6.5 percent of construction cost respectively.

Pico Rivera South Recycled Water Expansion Project

This project expands the recycled water system into south Pico Rivera. Water services within the City of Pico Rivera is served by three water purveyors: 1) City of Pico Rivera; 2) Pico Water District; and, 3) The San Gabriel Valley Water Company. Water is additionally conveyed to the Rio Hondo Spreading Grounds and San Gabriel Spreading Grounds in Pico Rivera.

The expansion on the Southern portion of the service area consists of approximately 7,000 linear feet of pipeline construction. Project costs are estimated at \$2,024,000 for the 7,000 linear feet of pipeline construction. Planning, Design, Environmental, and Project/Construction Management are estimated at 2.5 percent, 7 percent, 2 percent and 6.5 percent of construction cost respectively. Recycled water demand is approximately 200 AFY.

7.3.2 FUTURE RECYCLED WATER SUPPLY PROJECTS

AltAir Paramount Connection Project

CBMWD expects a large industrial customer (AltAir) to be connecting to their recycled water system in the summer of 2023. AltAir/World Energy operates out of the Paramount Refinery in the city of Paramount and has proposed to complete a conversion of the refinery to manufacture only renewable fuels. Such a conversion would eliminate the refining of crude oil at the facility, which is located at 14700 Downey Avenue.

The demand for AltAir will be approximately 2.24 MGD. The supply would be provided from Los Coyotes WRP that is owned and operated by Los Angeles County Sanitation District.

City of Monterey Park Recycled Water Expansion Project

This project expands the recycled water system into the City of Monterey Park. Water services within the city is served by the City of Monterey Park, California Water Service Company and San Gabriel Water Company.

The expansion consists of approximately 11,500 linear feet of pipeline construction. Project costs are estimated at \$3,675,000 for the 11,500 linear feet of pipeline construction. Planning, Design, Environmental, and Project/Construction Management are estimated at 2.5 percent, 7 percent, 2 percent and 6.5 percent of construction cost, respectively. Recycled water demand is approximately 750 AFY.

Central Basin Municipal Water District Recycled Water Distribution System Storage Project

The existing CBMWD recycled water system is divided into three pressure zones. Zone 1 in the north is supplied from the Rio Hondo Pump Station. To the south is Zone 2, which can receive water from Zone 1 through a pressure-reducing valve or from the Cerritos Pump

Station through variable frequency drives currently set to maintain system pressures. Zone 3 lies in the western portion of the service area and is supplied through the Hollydale Pump Station from Zone 2. All three pressure zones make a hydraulically closed system with no storage to buffer customer demands. Since water can be fed from Zone 1 into Zone 2, but not completely in the opposite manner, Rio Hondo Pump Station needs to be operational whenever there are demands in Zone 1 downstream of the pump station in the Pico Rivera and Montebello areas.

Operation of the recycled water system cannot be evaluated with an isolated view of only new customers due to the movement of water from one pressure zone to another and with two water sources. Hydraulic analysis encompasses all aspects of the recycled water system from pressure-reducing valve settings to pumping station operations. System expansion, customer changes in operations and demands can significantly alter system conditions experienced without storage.

In addition, recycled water supply is defined by a contract agreement with the Los Angeles Sanitation Districts for two recycled water sources. CBMWD's two recycled water supply sources are the San Jose Creek Water Reclamation Plant and the Los Coyotes Water Reclamation Plant. Overall volume limits can be increased over time and will need to be considered for future expansion. In the future, storage will help prevent supply shortages and balance demands from supply sources.

Prospective expansion projects and demands are emerging due to potable water conservation measures being implemented by the State of California, and locally within CBMWD's service area. To ensure a reliable regional recycled water supply to offset potable water demands; CBMWD is looking to implement storage in the form of storage tanks. The number, type, size, and locations for storage tanks is yet to be determined. Piping and pumping needs are also to be determined. CBMWD is looking to complete an in depth storage study that will include the additional demands currently being developed under related expansion projects.

7.4 DESALINATION OPPORTUNITIES

There are technologies in place to remove the salts in both brackish groundwater and ocean water for potable use. Because CBMWD has no groundwater rights and is not adjacent to the ocean, it does not have any projects to remove salts from local supplies to replace imported water; however, it supports these projects through MWD's programs where MWD provides incentives to other agencies to treat these sources.


7.4.1 DESALINATION OF GROUNDWATER

There are no sources of brackish groundwater in CBMWD's service area that could potentially serve as a water source for desalination.; however, CBMWD supports MWD's Local Resources Program, which currently provides incentives to MWD's member agencies of up to \$340 per AF for the production of desalinated ocean water or brackish groundwater.

7.4.2 DESALINATION OF OCEAN WATER

The CBMWD service area is land locked so there is no direct access to the ocean making construction of an ocean desalination facility infeasible. Regionally, there are active seawater barrier operations to prevent seawater intrusion, but they are not within CBMWD's service area. Ocean desalination may provide neighboring agencies with a new supply source, but CBMWD will not be investing in ocean desalination in the near future due to the high energy costs associated with operation and the lack of accessibility. CBMWD supports MWD's Seawater Desalination Program, which currently provides incentives to MWD's member agencies of up to \$340 per AF for the production of desalinated ocean water. Although CBMWD is not able to directly participate in seawater desalination, it participates indirectly by supporting MWD's program.

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CBMWD recognizes that the success of its operations comes from the participation of other agencies and the general public. For this 2020 UWMP, CBMWD encouraged broad participation prior to the public hearing and Board Adoption.

SECTION 8: PLAN ADOPTION PROCESS

CENTRAL BASIN MUNICIPAL WATER DISTRICT | 2020 URBAN WATER MANAGEMENT PLAN

SECTION 8

PLAN ADOPTION PROCESS

8.1 OVERVIEW

Recognizing that close coordination among other relevant public agencies is the key to the success of its 2020 UWMP, CBMWD has encouraged broad community participation. These agencies include representation from diverse social, cultural, and economic elements of the population within CBMWD's service area to assist in preparation of its plan. CBMWD provided 60-day notification letters to encourage agencies to participate in the UWMP preparation process. Copies of the draft UWMP and draft WSCP were made available for public review online prior to the public hearing. Shortly before the public hearing, a two-week and a one-week notice was published in the local press alerting the public of the public hearing. At a subsequent board meeting following the public hearing, CBMWD adopted the 2020 UWMP and WSCP on **June 28, 2021**. Finally, as required by the UWMP Act, this 2020 UWMP and the WSCP are being provided by CBMWD to DWR, the California State Library, and the public within 30 days of Board adoption. Details of coordination efforts are provided in **Sections 8.1.1** and **8.2**.

CBMWD's 2020 UWMP is a collaborative effort involving its own staff, outside agencies, and the general public.

8.1.1 WATER CODE REQUIREMENTS

Article 3 of the California Water Code (CWC) requires that CBMWD provide a minimum level of agency and public participation during the UWMP preparation process, as well as the adoption and implementation process of the UWMP. **Table 8.1** on the following page summarizes external coordination and outreach activities carried out by CBMWD during the preparation of its 2020 UWMP, along with corresponding dates.

Table 8.1: Coordination & Outreach during UWMP Preparation

Effort	Description	Date
"60-Day Notification"	Letters sent to Cities, County, and other Agencies (including CBMWD Member Agencies)	March 3, 2021
Public Hearing	Public Hearing Held at CBMWD Headquarters (two-week and one-week notices published)	June 28, 2021
Board Adoption	Board Adoption of UWMP by Resolution	June 28, 2021

Also in accordance with Article 3 of the CWC, CBMWD is required to distribute its official (adopted) UWMP and WSCP and make them publicly available. After the adoption of the 2020 UWMP and WSCP by Board Resolutions (attached as **Appendix E**) on **June 28, 2021**, CBMWD provided copies of its adopted plans in accordance with **Table 8.2** below:

Table 8.2: UWMP & WSCP Distribution Following Adoption of Plans

Effort	Description	Date
DWR Submittal	Submitted UWMP and WSCP to DWR (within 30 days of adoption)	June 28, 2021
Agency Submittal	Submitted UWMP and WSCP to the California State Library and County of Los Angeles (within 30 days of adoption)	July 1, 2021
Public Access	Made UWMP and WSCP available to public (within 30 days of submittal to DWR)	July 1, 2021

8.2 DETAILS OF COORDINATION EFFORTS

8.2.1 GENERAL PUBLIC COORDINATION

To meet CWC and to provide for its own benefit, CBMWD has actively solicited community participation during the UWMP preparation and adoption process by performing the activities on the following page.

- Encouraging attendance and participation in Board Meetings prior to the actual UWMP Public Hearing as part of CBMWD's ongoing community outreach efforts
- Soliciting comments on the UWMP while providing copies of its Draft 2020 UWMP at the CBMWD office and on its website

- Holding a public hearing for the express purpose of inviting UWMP comments and opening the floor for public comments to be received

On June 28, 2021, CBMWD held a Public Hearing to receive comments on the 2020 UWMP, including the WSCP as part of the UWMP. Notification of the public meeting for consideration of adoption of CBMWD's draft UWMP was printed in a local newspaper, a copy of which is provided in **Appendix D**. All comments received prior to and during the Public Hearing were taken into consideration in the preparation of the final report. **No comments were received during the public hearing.**

8.2.2 OUTSIDE AGENCY COORDINATION

CBMWD coordinated the development of this UWMP with several outside agencies, including MWD, its member agencies, and the Cities this reside in CBMWD's service area. As the major supplier of imported water to Southern California, MWD's outreach efforts continue to play a large role in the preparation of its own member agencies' UWMPs, including CBMWD.

MWD COORDINATION

As a member agency of MWD, CBMWD staff coordinated the development of this UWMP in accordance with MWD's outreach efforts. Portions of this UWMP have been developed based on data from MWD's 2020 UWMP, IRP, and other documents, as well as from MWD's outreach efforts in preparing their 2020 UWMP. Since MWD adopted their 2020 UWMP on **May 11, 2021**, this benefited CBMWD's UWMP preparation efforts. Throughout this 2020 UWMP, MWD's reports and data are referenced or re-stated. One example of this is in **Section 5**, which contains CBMWD's contingency plan. CBMWD's contingency plan is in part dependent on MWD's contingency plan (i.e., Water Surplus & Drought Management Plan or "WSDM"), since CBMWD is currently 100 percent reliant on MWD as a water source. Another example is conservation measures, as CBMWD coordinates its conservation efforts (most notably rebate programs), with MWD. Other notable coordination with MWD includes reliability planning/forecasting and water quality impacts. As one of CBMWD's board members is a MWD representative, CBMWD remains in close contact with MWD for its routine operations and UWMP preparation.

MEMBER AGENCY COORDINATION

CBMWD contracted with a private consultant for the preparation of its own 2020 UWMP. As a regional wholesaler, CBMWD coordinated the development of this plan with staff from CBMWD's customer water agencies and MWD.

8.2.3 COORDINATION SUMMARY

CBMWD coordination efforts in preparing its 2020 UWMP are summarized in **Table 8.3** below:

Table 8.3: UWMP Coordination Efforts

Agency	Helped Plan Prep.	Contacted for Assistance	Comments on Draft	Notified of Public Hearing	Attended Public Hearing
City of Artesia		✓		✓	✓
City of Bell		✓		✓	✓
City of Bellflower		✓		✓	✓
City of Bell Gardens		✓		✓	✓
Bellflower Home & Garden Water Co.		✓		✓	✓
Bellflower-Somerset Mutual Water Co.		✓		✓	✓
California Water Service Co. - Commerce		✓		✓	✓
City of Cerritos		✓		✓	✓
City of Commerce		✓		✓	✓
City of Cudahy		✓		✓	✓
City of Downey		✓		✓	✓
Golden State Water Company		✓		✓	✓
City of Hawaiian Gardens		✓		✓	✓
City of Huntington Park		✓		✓	✓
La Habra Heights County Water District		✓		✓	✓
County of Los Angeles		✓		✓	✓
City of Lakewood		✓		✓	✓
Liberty Utilities		✓		✓	✓
City of Lynwood		✓		✓	✓
Lynwood Park Mutual Water Co.		✓		✓	✓
City of Maywood		✓		✓	✓
Maywood Mutual Water Company #1		✓		✓	✓
Maywood Mutual Water Company #2		✓		✓	✓
Maywood Mutual Water Company #3		✓		✓	✓
Metropolitan Water District of SoCal		✓		✓	✓
City of Montebello		✓		✓	✓
City of Monterey Park		✓		✓	✓
Montebello Land & Water Co.		✓		✓	✓
City of Norwalk		✓		✓	✓
Orchard Dale Water District		✓		✓	✓
City of Paramount		✓		✓	✓
City of Pico Rivera		✓		✓	✓
Pico Water District		✓		✓	✓
San Gabriel Valley Water Co.		✓		✓	✓
City of Santa Fe Springs		✓		✓	✓
City of Signal Hill		✓		✓	✓

Agency	Helped Plan Prep.	Contacted for Assistance	Comments on Draft	Notified of Public Hearing	Attended Public Hearing
City of South Gate		✓		✓	✓
South Montebello Irrigation District		✓		✓	✓
Suburban Water Systems		✓		✓	✓
Tract 180 Water Co.		✓		✓	✓
Tract 349 Water Co.		✓		✓	✓
City of Vernon		✓		✓	✓
Walnut Park Mutual Water Co.		✓		✓	✓
Water Replenishment District of SoCal		✓		✓	✓
City of Whittier		✓		✓	✓

8.3 UWMP SUBMITTAL

CBMWD's final 2020 UWMP and WSCP were approved by its Board of Directors on **June 28, 2021**. The final plans were submitted to DWR within 30 days of Board approval and include all information necessary to meet the requirements of California Water Code Division 6, Part 2.6 (Urban Water Management Planning).

By **June 28, 2021**, CBMWD's approved 2020 UWMP and WSCP were filed with DWR. By **July 1, 2021**, CBMWD's plans were submitted to the California State Library, County of Los Angeles, and cities within its service area. CBMWD will make both plans available for public review no later than 30 days after filing with DWR.

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APPENDICES A - H

CENTRAL BASIN MUNICIPAL WATER DISTRICT | 2020 URBAN WATER MANAGEMENT PLAN



Central Basin
Municipal Water District

Appendix A: UWMP Checklist

Central Basin Municipal Water District | 2020 Urban Water Management Plan



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Appendix B: DWR Submittal Tables

Central Basin Municipal Water District | 2020 Urban Water Management Plan



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Appendix C: 60-Day Notification of Public Hearing

Central Basin Municipal Water District | 2020 Urban Water Management Plan



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Los Angeles County

Mr. Don Kotas
President
Bellflower Home & Garden Water Company
17447 Lakewood Blvd.
Bellflower, CA 90706

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Kotas:

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

UWMPs are prepared by California's urban water suppliers to support their long-term resources planning and ensure adequate water supplies are available to meet existing and future water demands. In accordance with the Urban Water Management Planning Act, every urban water supplier that either provides over 3,000 acre-feet of water annually or serves 3,000 or more connections is required to adopt an UWMP every five years.

A draft 2020 UWMP will be available for review on Central Basin's website prior to the public hearing, which is tentatively scheduled for May 24, 2021 at 10:00am and will be conducted by teleconference.

If your agency would like more information or to submit questions, please contact me at (323) 201-5510 or by email at jeremym@centralbasin.org.

Sincerely,

Jeremy Melendez
Water Resources Specialist



Central Basin

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Mr. Steve Lenton
General Manager
Bellflower-Somerset Mutual Water Co
10016 E. Flower St.
Bellflower, CA 90706

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Lenton:

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

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Sincerely,

Jeremy Melendez
Water Resources Specialist



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Los Angeles County

Mr. James Crawford
District Manager
California Water Service Company
2000 S. Tubeway Avenue
Commerce, CA 90040

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Crawford

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

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Sincerely,

Jeremy Melendez
Water Resources Specialist



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Mr. William Rawlings
City Manager
City of Artesia
18747 Clarkdale Avenue
Artesia, CA 90701

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Rawlings:

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

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Sincerely,

Jeremy Melendez
Water Resources Specialist



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Mr. Paul Philips
Interim City Manager
City of Bell
6330 Pine Avenue
Bell, CA 90201

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Philips:

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

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If your agency would like more information or to submit questions, please contact me at (323) 201-5510 or by email at jeremym@centralbasin.org.

Sincerely,

Jeremy Melendez
Water Resources Specialist



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Mr. Michael O'Kelly
City Manager
City of Bell Gardens
7100 South Garfield Avenue
Bell Gardens, CA 90201

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. O'Kelly:

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If your agency would like more information or to submit questions, please contact me at (323) 201-5510 or by email at jeremym@centralbasin.org.

Sincerely,

Jeremy Melendez
Water Resources Specialist



Central Basin

Municipal Water District

6252 Telegraph Road
Commerce, CA 90040-2512
Telephone: (323) 201-5500
www.centralbasin.org

March 3, 2021

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and Unincorporated Areas of
Los Angeles County

Mr. Jeff Stewart
City Manager
City of Bellflower
16600 Civic Center Drive
Bellflower, CA 90706

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Stewart:

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Water Resources Specialist



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Los Angeles County

Mr. Art Gallucci
City Manager
City of Cerritos
18125 S. Bloomfield Avenue
Cerritos, CA 90703

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Gallucci

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Water Resources Specialist



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Mr. Edgar Cisneros
City Manager
City of Commerce
2535 Commerce Way
Commerce, CA 90040

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Cisneros:

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Los Angeles County

Mr. Henry Garcia
Interim City Manager
City of Cudahy
5220 Santa Ana Street
Cudahy, CA 90201

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Garcia

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Mr. Gilbert Livas
City Manager
City of Downey
11111 Brookshire Avenue
Downey, CA 90241

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Livas:

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Mr. Ernie Hernandez
City Manager
City of Hawaiian Gardens
21815 Pioneer Boulevard
Hawaiian Gardens, CA 90716

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Hernandez:

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and Unincorporated Areas of
Los Angeles County

Mr. Ricardo Reyes
City Manager
City of Huntington Park
6550 Miles Avenue
Huntington Park, CA 90255

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Reyes:

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Water Resources Specialist



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Mr. Thaddeus McCormack
City Manager
City of Lakewood
5050 N. Clark Avenue
Lakewood, CA 90712

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. McCormack:

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Water Resources Specialist



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March 3, 2021

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Mr. Thomas Thornton
Director of Public Works
City of Lynwood
11330 Bullis Road
Lynwood, CA 90262

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Thornton:

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Ms. Jennifer Vasquez
City Manager
City of Maywood
4319 E. Slauson Avenue
Maywood, CA 90270

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Ms. Vasquez:

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Mr. Rene Bobadilla
City Manager
City of Montebello
1600 W. Beverly Blvd.
Montebello, CA 90640

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Bobadilla:

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and Unincorporated Areas of
Los Angeles County

Mr. Ron Bow
City Manager
City of Monterey Park
320 West Newmark Avenue
Monterey Park, CA 91754

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Bow:

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

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If your agency would like more information or to submit questions, please contact me at (323) 201-5510 or by email at jeremym@centralbasin.org.

Sincerely,

Jeremy Melendez
Water Resources Specialist



Central Basin

Municipal Water District

6252 Telegraph Road
Commerce, CA 90040-2512
Telephone: (323) 201-5500
www.centralbasin.org

March 3, 2021

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Los Angeles County

Mr. Jesus Gomez
City Manager
City of Norwalk
12700 Norwalk Blvd
Norwalk, CA 90650

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Gomez:

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

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Sincerely,

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Water Resources Specialist



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Los Angeles County

Mr. John Moreno
City Manager
City of Paramount
15300 Downey Avenue
Paramount, CA 90723

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Moreno:

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Jeremy Melendez
Water Resources Specialist



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March 3, 2021

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Los Angeles County

Mr. Steve Carmona
City Manager
City of Pico Rivera
6615 Passons Boulevard
Pico Rivera, CA 90660

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Carmona:

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

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Sincerely,

Jeremy Melendez
Water Resources Specialist



Central Basin

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March 3, 2021

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Los Angeles County

Mr. Ray Cruz
City Manager
City of Santa Fe Springs
11710 E. Telegraph Road
Santa Fe Springs, CA 90670

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Cruz:

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Water Resources Specialist



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March 3, 2021

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Ms. Hannah Shin-Heydorn
City Manager
City of Signal Hill
2175 Cherry Avenue
Signal Hill, CA 90755

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Ms. Shin-Heydorn:

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

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Water Resources Specialist



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Mr. Art Cervantes, P.E.
Director of Public Works
City of South Gate
8560 California Avenue
South Gate, CA 90280

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Cervantes:

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Water Resources Specialist



Central Basin

Municipal Water District

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March 3, 2021

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and Unincorporated Areas of
Los Angeles County

Mr. Daniel Wall
Director of Public Works
City of Vernon
4305 Santa Fe Avenue
Vernon, CA 90058

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Wall:

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Water Resources Specialist



Central Basin

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March 3, 2021

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Los Angeles County

Mr. Brian Saeki
City Manager
City of Whittier
13230 East Penn Street
Whittier, CA 90601

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Saeki:

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Water Resources Specialist



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March 3, 2021

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Mr. David Schickling
General Manager
Golden State Water Company
12035 Burke Street
Santa Fe Springs, CA 90670

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Schickling:

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Water Resources Specialist



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March 3, 2021

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Mr. Michael Gualtieri
General Manager
La Habra Heights County Water District
1271 N. Hacienda Blvd.
La Habra Heights, CA 90631

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Gualtieri:

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Mr. Frank Heldman
Director of Operations
Liberty Utilities
9750 Washburn Road
Downey, CA 90241

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Heldman:

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and Unincorporated Areas of
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Mr. Alberto Contreras
Acting Manager
Lynwood Park Mutual Water Co.
2644 E. 124th St
Compton, CA 90222

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Contreras:

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

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If your agency would like more information or to submit questions, please contact me at (323) 201-5510 or by email at jeremym@centralbasin.org.

Sincerely,

Jeremy Melendez
Water Resources Specialist



Central Basin

Municipal Water District

6252 Telegraph Road
Commerce, CA 90040-2512
Telephone: (323) 201-5500
www.centralbasin.org

March 3, 2021

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Mr. Sergio Palos
General Manager
Maywood Mutual Water Co. #1
5953 South Gifford Avenue
Huntington Park, CA 90255

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Palos:

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

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Sincerely,

Jeremy Melendez
Water Resources Specialist



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March 3, 2021

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Mr. Joe Rodriguez
General Manager
Maywood Mutual Water Co. #2
3521 East Slauson Avenue
Maywood, CA 90270

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Rodriguez:

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

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Sincerely,

Jeremy Melendez
Water Resources Specialist



Central Basin

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March 3, 2021

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Mr. Robert Rohlf
Director of Operations
Maywood Mutual Water Co. #3
6151 Heliotrope Avenue
Maywood, CA 90270

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Rohlf:

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

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Sincerely,

Jeremy Melendez
Water Resources Specialist



Central Basin

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March 3, 2021

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Mr. Korey Bradbury
General Manager
Montebello Land & Water
P.O. Box 279
Montebello, CA 90640

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Bradbury:

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

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Sincerely,

Jeremy Melendez
Water Resources Specialist



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March 3, 2021

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Mr. Ed Castaneda
General Manager
Orchard Dale Water District
13819 E Telegraph Rd
Whittier, CA 90604

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Castaneda:

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Water Resources Specialist



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Mr. Mark Grajeda
General Manager
Pico Water District
4843 Church Street
Pico Rivera, CA 90660

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Grajeda:

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Water Resources Specialist



Central Basin

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March 3, 2021

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Ms. Norma Garcia-Gonzalez
Director of LA County Parks & Rec
Los Angeles County
1000 S. Fremont Ave.
Alhambra, CA 91803

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Ms. Garcia-Gonzalez:

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Water Resources Specialist



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Mr. Dan Arrighi
Water Resources Manager
San Gabriel Valley Water Company
11142 Garvey Avenue
El Monte, CA 91734

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Arrighi:

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Water Resources Specialist



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Mr. Alberto Corrales
General Manager
South Montebello Irrigation District
437 S. Bluff Road
Montebello, CA 90640

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Corrales:

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Mr. Craig Gott
President
Suburban Water Systems
2235 E. Garvey Avenue North, Suite A
West Covina, CA 91791

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Gott:

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Water Resources Specialist



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Mr. George Perez
General Manager
Tract 180 Water Company
4544 Florence Ave.
Cudahy, CA 90201

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Perez:

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A draft 2020 UWMP will be available for review on Central Basin's website prior to the public hearing, which is tentatively scheduled for May 24, 2021 at 10:00am and will be conducted by teleconference.

If your agency would like more information or to submit questions, please contact me at (323) 201-5510 or by email at jeremym@centralbasin.org.

Sincerely,

Jeremy Melendez
Water Resources Specialist



Central Basin

Municipal Water District

6252 Telegraph Road
Commerce, CA 90040-2512
Telephone: (323) 201-5500
www.centralbasin.org

March 3, 2021

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La Habra Heights	Vernon
Lakewood	

and Unincorporated Areas of
Los Angeles County

Mr. Martin Susnir
General Manager
Tract 349 Water Company
4630 Santa Ana Street
Cudahy, CA 90201

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Susnir:

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

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and Unincorporated Areas of
Los Angeles County

Mr. Martin Gonzales
Water Superintendent
Walnut Park Mutual Water Company
2460 East Florence Ave
Walnut, CA 90255

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Gonzales:

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

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Los Angeles County

Mr. Ted Johnson
Assistant General Manager
Water Replenishment District of Southern California
4040 Paramount Blvd
Lakewood, CA 90713

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Johnson:

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

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and Unincorporated Areas
of Los Angeles County

Mr. Edgar Fandialan
Principal Engineer, Water Resources Management Group
Metropolitan Water District of Southern California
700 Alameda St
Los Angeles, CA 90012

Subject: Notice of Preparation of Central Basin Municipal Water District's 2020 Urban Water Management Plan

Dear Mr. Fandialan:

This letter serves as a formal 60-day notice to inform your agency that the Central Basin Municipal Water District (Central Basin) is in the process of preparing updates to its Urban Water Management Plan (UWMP). Pursuant to the requirement of California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621(b), every urban water supplier required to prepare a plan shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.

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Sincerely,

Jeremy Melendez
Water Resources Specialist



Central Basin
Municipal Water District

Appendix D: Two-Week & One-Week Notification of Public Hearing

Central Basin Municipal Water District | 2020 Urban Water Management Plan



Central Basin
Municipal Water District

Appendix E: Board Resolutions Adopting 2020 UWMP & WSCP

Central Basin Municipal Water District | 2020 Urban Water Management Plan



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Appendix F: 2016 Gateway Regional Water Conservation Alliance Report

Central Basin Municipal Water District | 2020 Urban Water Management Plan

FINAL

**Los Angeles Gateway Region
Integrated Regional Water
Management Joint Powers
Authority**



SUMMARY OF “BASELINE AND COMPLIANCE URBAN PER CAPITA WATER USE” DETERMINATION

June 2016



861 Village Oaks Drive, Suite 100 ▪ Covina, California 91724
Phone: (626) 967-6202 ▪ FAX: (626) 331-7065 ▪ www.stetsonengineers.com

Northern California ▪ Southern California ▪ Arizona ▪ Colorado

BASELINE AND COMPLIANCE URBAN PER CAPITA WATER USE

California Water Code Section 10608.20(a)(1)

Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

California Water Code Section 10608.28

(a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

- (1) Through an urban wholesale water supplier.*
- (2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).*
- (3) Through a regional water management group as defined in Section 10537.*
- (4) By an integrated regional water management funding area.*
- (5) By hydrologic region.*
- (6) Through other appropriate geographic scales for which computation methods have been developed by the department.*

(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

Introduction

According to California Water Code Sections 10608.20(a)(1) and 10608.28, urban retail water suppliers may plan, comply, and report on a regional basis, an individual basis or both. The California Department of Water Resources' (DWR) guidebook titled, "Methodologies for Calculating Baseline and Compliance Urban per Capita Water Use" includes "Methodology 9" which prescribes three options by which the regional alliance

compliance may be calculated. Each group of water suppliers agreeing among themselves to plan, comply, and report as a region is referred to in Methodology 9 as a “regional alliance.”

Calculation of Regional Targets

Water suppliers in a regional alliance have three options to calculate the regional targets.

Option 1

This option preserves maximum flexibility at the water supplier level. Each retail water supplier in a regional alliance first calculates its individual target. The individual targets from each retail water supplier is then multiplied by each retail water supplier’s population. The total is divided by the total population in the alliance to obtain the regional target. For the 2010 urban water management plans, retail water suppliers used their estimated population data to generate the regional targets. However, for compliance in 2015 and 2020, the population weighting of the individual targets must be based upon the compliance-year population data. Because 2010 U.S. Census data was not available until 2012, retail water suppliers were required to recalculate its individual population, baseline and targets in 2015. A modification in any individual target or a change in membership in a regional alliance will require a recalculation of the entire regional target.

Option 2

The second option for an alliance to calculate a regional target is to sum up the individual retail water supplier’s gross water use and service area populations to develop regional gross water use and population. The alliance would then calculate regional base daily per capita use and choose one target method to calculate a regional target. This option requires all the members to use the same baseline period.

Option 3

A third option is to calculate regional gross water use or population directly for the entire regional alliance area. Regional base daily per capita use and a regional water use target would then be derived. Like Option 2, members of alliances using this option must use the same baseline period and the same target method. The regional target may not exceed 95 percent of the region's 5-year Base Daily Per Capita Water Use.

Results

The Gateway Regional Alliance has chosen Option 1 to estimate its Regional Target. The following tabulation summarizes the steps used with Option 1 and to calculate the Regional Target. As shown in the tabulation below, the "Regional Alliance Weighted Average 10-15 Year Baseline" is 128 GPCD. The "Regional Alliance Weighted Average 2020 Target" is 111 GPCD. The "Regional Alliance 2015 Interim Target" is based on the mid-point between the Weighted Average 10-15 Year Baseline (129 GPCD) and the Weighted Average 2020 Target (115 GPCD). The Regional Alliance 2015 Interim Target is 120 GPCD $((128 + 111) / 2)$.

Based on each of the member agencies' individual 2015 Actual water use, the "Regional Alliance 2015 Actual water use" is 102 GPCD. The 2015 Actual water use of 102 GPCD is less than the "Regional Alliance 2015 Interim Target" of 120 GPCD. Therefore, the Gateway Regional Alliance achieved its Targeted Reduction for 2015 and is in compliance with the 2015 Interim Target.

SB X7-7 RA1 - Weighted Baseline				
Participating Member Agency Name	10-15 year Baseline GPCD*	Average Population During 10-15 Year Baseline Period	(Baseline GPCD) X (Population)	Regional Alliance Weighted Average 10-15 Year Baseline GPCD
City of Downey	144	108,998	15,695,712	
City of Lakewood	107	58,241	6,231,787	
City of Long Beach	134	457,727	61,335,418	
City of Lynwood	100	63,227	6,322,700	
City of Norwalk	107	16,372	1,751,804	
City of Paramount	118	55,137	6,506,166	
City of Pico Rivera	121	40,513	4,902,073	
Pico Water District	150	22,598	3,389,700	
City of Santa Fe Springs	101	14,876	1,502,476	
City of Signal Hill	188	10,621	1,996,748	
City of South Gate	102	87,841	8,959,782	
City of Whittier	155	53,155	8,239,025	
Regional Alliance Total	1,527	989,306	126,833,391	128
<i>*All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6, Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable. These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.</i>				
NOTES: The City of Bell Gardens, City of Bellflower, and City of Vernon were removed from the 2015 Regional Alliance calculations. The City of Bell Gardens and City of Bellflower are not required to prepare an UWMP. The City of Vernon has a population of 100 and is exclusively industrial. The City of Vernon may not be required to prepare an UWMP.				

SB X7-7 RA1 - Weighted 2020 Target				
Participating Member Agency Name	2020 Target GPCD*	2015 Population	(Target) X (Population)	Regional Alliance Weighted Average 2020 Target
City of Downey	137	112,354	15,392,482	
City of Lakewood	99	59,331	5,873,769	
City of Long Beach	107	481,784	51,550,888	
City of Lynwood	85	62,919	5,348,115	
City of Norwalk	110	18,361	2,019,710	
City of Paramount	114	55,302	6,304,428	
City of Pico Rivera	117	39,453	4,616,001	
Pico Water District	142	22,799	3,237,458	
City of Santa Fe Springs	100	14,644	1,464,400	
City of Signal Hill	151	11,500	1,736,500	
City of South Gate	100	79,983	7,998,300	
City of Whittier	134	56,200	7,530,800	
Regional Alliance Total	1,396	1,014,630	113,072,851	111
<i>*All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6, Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable. These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.</i>				
NOTES: The City of Bell Gardens, City of Bellflower, and City of Vernon were removed from the 2015 Regional Alliance calculations. The City of Bell Gardens and City of Bellflower are not required to prepare an UWMP. The City of Vernon has a population of 100 and is exclusively industrial. The City of Vernon may not be required to prepare an UWMP.				

SB X7-7 RA1 - 2015 Target		
Weighted Average 10-15 year Baseline GPCD	Weighted Average 2020 Target	Regional Alliance 2015 Interim Target
128	111	120
NOTES		

SB X7-7 RA1 - 2015 GPCD (Actual)				
Participating Member Agency Name	2015 Actual GPCD ¹	2015 Population	(2015 GPCD) X (2015 Population)	Regional Alliance 2015 GPCD (Actual)
City of Downey	119	112,354	13,370,112	
City of Lakewood	82	59,331	4,865,142	
City of Long Beach	102	481,784	49,141,968	
City of Lynwood	80	62,919	5,033,520	
City of Norwalk	111	18,361	2,038,071	
City of Paramount	103	55,302	5,696,106	
City of Pico Rivera	103	39,453	4,063,659	
Pico Water District	108	22,799	2,462,292	
City of Santa Fe Springs	83	14,644	1,215,452	
City of Signal Hill	143	11,500	1,644,500	
City of South Gate	81	79,983	6,478,623	
City of Whittier	131	56,200	7,362,200	
Regional Alliance Totals	1,246	1,014,630	103,371,645	102
¹ All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6, Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable. These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.				
NOTES: The City of Bell Gardens, City of Bellflower, and City of Vernon were removed from the 2015 Regional Alliance calculations. The City of Bell Gardens and City of Bellflower are not required to prepare an UWMP. The City of Vernon has a population of 100 and is exclusively industrial. The City of Vernon may not be required to prepare an UWMP.				

SB X7-7 RA1 - Compliance Verification				
2015 GPCD (Actual)	2015 Interim Target GPCD	Economic Adjustment ¹ <i>Enter "0" if no adjustment</i>	Adjusted 2015 GPCD <i>(if economic adjustment used)</i>	Did Alliance Achieve Targeted Reduction for 2015?
102	120	0	102	YES
¹ Adjustments for economic growth can be applied to either the individual supplier's data or to the aggregate regional alliance data (but not both), depending upon availability of suitable data and methods.				
NOTES				



Central Basin
Municipal Water District

Appendix G: City of South Gate 2017 Hazard Mitigation Plan

Central Basin Municipal Water District | 2020 Urban Water Management Plan

CITY OF SOUTH GATE

HAZARD MITIGATION PLAN

PUBLIC REVIEW DRAFT

Prepared by:



3900 Kilroy Airport Way, Suite 120

Long Beach, CA 90806

Prepared for:

CITY OF SOUTH GATE

8650 CALIFORNIA AVENUE

SOUTH GATE, CA 90280

July 2017

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CHAPTER 1: INTRODUCTION

A natural hazard is a natural occurring event, such as an earthquake or flood that could harm human life and property. Natural hazards pose severe risks to people and property. Such events may cause injuries or deaths, and damage or destroy buildings and infrastructure. People may be displaced from their homes, key services can be disrupted, and the local economy may be affected. While a community cannot fully protect against every potential impact of every hazard, such impacts can be reduced or mitigated. This Local Hazard Mitigation Plan (LHMP, Plan) identifies opportunities to mitigate these impacts and improve resiliency to natural hazards in the City of South Gate.

1.1 Plan Purpose and Mitigation Goals

This Plan helps the City of South Gate become a safer place to live and work by identifying effective and feasible actions to achieve the following mitigation-related public safety goals identified in the General Plan:

1. Enhanced protection of life and property from hazard impacts.
2. Municipal and emergency operations are fully functional during disasters.
3. Strengthened partnerships within the community and throughout the region that enhance hazard mitigation, preparation, response, and recovery capabilities.
4. Educated and empowered community members prepare for, mitigate, respond to, and recover from hazards that affect their family and property.

Plan actions include education and outreach programs; the development of partnerships with businesses, nonprofits, and other government agencies; capital improvements; updates to municipal regulations and practices; and monitoring and reporting activities. This Plan establishes a basis for coordination and collaboration among participating public and private organizations, identifies and prioritizes future mitigation activities and projects, and assists in meeting the requirements of federal assistance programs.

The City prepared this Plan to be consistent with current Federal Emergency Management Agency (FEMA) requirements for hazard mitigation plans and to inform the Safety Element of the City's General Plan.

1.2 Authority

Federal Emergency Management Agency

The Federal Disaster Management Act of 2000 (DMA 2000), Section 322 (a-d), requires that any local government wishing to receive federal disaster mitigation funds have a mitigation plan that accomplishes the following:

- Describes the process for identifying hazards, risks, and vulnerabilities in the community.

- Identifies and prioritizes hazard mitigation activities.
- Encourages the development of local mitigation actions.
- Provides technical support for hazard mitigation efforts.

This Plan meets the requirements identified in DMA 2000 and is consistent with current FEMA hazard mitigation requirements and guidance.

State of California

California Government Code Section 65302.6 (as added by Assembly Bill [AB] 2140) identifies specific components to include in a local mitigation plan:

- An evaluation of the earthquake performance of public facilities that provide critical government functions, shelters, and other essential services.
- An inventory of private facilities that may be hazardous.
- Strategies to reduce the risk from private and government facilities.

In addition, California Government Code Section 8685.9 (also as added by AB 2140) provides for additional disaster funding if a jurisdiction has an adopted mitigation plan as part of its General Plan. This Plan is consistent with Sections 65302.6 and 8685.9, as it is integrated with the Safety Element of the General Plan.

1.3 Plan Adoption

The City of South Gate will adopt the LHMP via a resolution of the City Council following plan approval from FEMA. Figure 1 is the resolution used to adopt the 2017 Local Hazard Mitigation Plan.

Figure 1. City of South Gate 2017 Local Hazard Mitigation Plan Resolution

[A copy of the resolution will be added upon receipt of Approved Pending Adoption Notification from FEMA.]

1.4 Plan Use

Each section of the Plan provides information and resources to assist people in understanding the hazard-related issues facing South Gate residents and businesses. The Plan consists of the following chapters:

- Chapter 1: Introduction. The introduction describes the background and purpose of the LHMP, including the Plan's regulatory authority and a summary of the Plan development process.
- Chapter 2: Community Profile. The community profile summarizes the history, geography, demographics, and development conditions of South Gate. It provides background and additional context for the hazard assessment and mitigation actions.
- Chapter 3: Hazard Profiles. This chapter identifies the types of hazards present in South Gate, their historical occurrence in and around the community, the risks these hazards pose to South Gate, and the vulnerability of critical facilities and infrastructure to hazardous events.
- Chapter 4: Mitigation Actions. This chapter provides policies and strategies to reduce the risks to residents, businesses, and critical facilities and infrastructure from hazardous events. These policies and strategies may include pre-disaster mitigation programs or post-disaster response and recovery activities.
- Chapter 5: Plan Maintenance. This chapter provides information on implementing, monitoring, and evaluating the Plan. It also discusses the assets and capabilities available to implement the policies and strategies in the Mitigation Actions chapter, and provides opportunities for continued public involvement.

1.5 Hazard Mitigation Planning Process

LHMP Team

A variety of stakeholders, including City departments, local agencies, local businesses and landowners, and South Gate residents, came together to inform this Plan, which reflects local values, concerns, and opinions. City staff established the LHMP Team to draft this Plan, which was reviewed and revised through public outreach efforts. Staff from the following City departments and other agencies comprised the LHMP Team:

- City of South Gate Administrative Services Department
- City of South Gate Community Development Department
- City of South Gate Parks & Recreation Department
- City of South Gate Police Department
- City of South Gate Public Works Department
- Los Angeles County Fire Department
- Los Angeles County Office of Emergency Management

The LHMP Team held a kickoff meeting and three additional planning meetings to discuss preparation of this Plan. Team members discussed the Plan objectives, reviewed hazards, and prepared and reviewed mitigation goals and actions. Table 1 presents the results of these meetings. Appendix A provides materials and sign-in sheets from these meetings.

Table 1. LHMP Team Meetings

Meeting Name	Meeting Date	Purpose and Outcomes
Kickoff Meeting	July 14, 2015	Provided an introduction to the project, discussed overarching goals for the effort, discussed communication protocols, and identified points of contact.
LHMP Team Meeting 1	August 12, 2015	Provided an overview of the LHMP process, identified hazards of concern, finalized critical facilities list, and prioritized hazards with LHMP Team members.
LHMP Team Meeting 2	September 16, 2015	Provided an overview of the hazard profiles and preliminary results of the risk assessment for each hazard and critical facility identified. Developed hazard mitigation goals and identified key hazard mitigation actions.
LHMP Team Meeting 3	November 4, 2015	Provided draft hazard mitigation actions for review. Finalized mitigation action table.
Planning Commission Update	April 5, 2016	Staff provided a status update to the Planning Commission regarding the preparation of the LHMP and the General Plan Safety Element. Additional details are provided in Appendix B.

Online Survey

As part of the public engagement and outreach process for the LHMP, the City created an online survey for community members. A link to the survey was placed on the City's website as well as distributed via City e-mail lists. The survey asked about potential hazards facing South Gate, and what steps community members have taken or are interested in taking to reduce the threat from these hazards. From 143 respondents that participated, the survey produced the following key outcomes:

- Earthquakes, diseases or pests, and drought were the three potential hazards that caused the most concern for community members.
- Only 20 percent of respondents are part of South Gate's Community Emergency Response Team, but over half of remaining respondents were interested in learning more about joining.
- Although nearly half of the City is in FEMA's 500-year flood zone, only 27 percent of respondents have flood insurance.

A detailed summary of the online survey is included in Appendix B.

Public/Community Events

The City participated in the South Gate Family Day event that was held on October 24, 2015, at South Gate Park. This event included over 40 booths from which community groups, City departments, and local businesses shared

information, sold goods/services, and educated attendees. The City occupied a booth space to talk about the LHMP and handed out hard copy versions of the online survey to attendees; survey respondents were entered into a raffle drawing for gift cards to local restaurants and three-day emergency backpacks. Through this event, the City received over 60 hard copy surveys in both English and Spanish. The results of these surveys were added to the online survey results compiled in Appendix B.

1.6 Public Review Draft

The City completed and released the public review draft LHMP to the public for review and comment on July 13, 2017 for 30 days. Electronic versions of the document were provided on the City's website and hard copy versions were provided at City Hall (City Clerk and Planning Departments), Hollydale Library, and the Leland R. Weaver Library.

1.7 Supporting Plans, Studies, and Technical Reports

Multiple plans, studies, technical reports, and other sources of information were used to develop this Plan. Table 2 identifies these sources of information used to develop certain sections.

Table 2. Sources of Information Used to Create the LHMP

LHMP Section	Sources of Information
2.1 Physical Setting	City of South Gate – General Plan US Census Bureau
2.2 History	City of South Gate – History of South Gate Los Angeles County Library – South Gate: Frequently Asked Questions US Census Bureau
2.3 Community Profile	US Census Bureau
2.4 Economic Trends	Southern California Association of Governments – Local Profile, South Gate US Census Bureau
2.5 Existing Land Uses	City of South Gate – General Plan City staff/Local Hazard Mitigation Plan Team
2.6 Development Trends	City of South Gate – General Plan City staff/Local Hazard Mitigation Plan Team
2.7 Critical Facilities	City staff/Local Hazard Mitigation Plan Team
2.8 Disaster and Evacuation Routes	Los Angeles County Operational Area, Area E Staff; City staff/Local Hazard Mitigation Plan Team
3.1 Hazard Identification and Prioritization	City staff/Local Hazard Mitigation Plan Team
3.2 Climate Change Considerations	N/A

LHMP Section	Sources of Information
3.3 Vulnerability/Risk Assessment Method	N/A
3.4 Hazard Profiles	As listed by hazard, below
-Drought	California Climate Adaptation Planning Guide California State Multi-Hazard Mitigation Plan City of South Gate – Urban Water Management Plan Golden State Water Company – Central Basin West Metropolitan Water District – Sources of Supply US Drought Monitor
-Seismic Hazards	California Geologic Survey – Alquist-Priolo Earthquake Faults California State Multi-Hazard Mitigation Plan Los Angeles County Library – South Gate: Frequently Asked Questions Southern California Earthquake Center US Geologic Survey – Earthquakes Hazard Program US Geologic Survey – Uniform California Earthquake Rupture Forecast
-Extreme Heat	Cal-Adapt California Climate Adaptation Planning Guide California Department of Public Health
-Hazardous Materials	Alameda Corridor Transportation Authority California Department of Toxic Substances Control California State Multi-Hazard Mitigation Plan California State Water Resources Control Board City of South Gate – General Plan
-Severe Weather	California Climate Adaptation Planning Guide California State Multi-Hazard Mitigation Plan National Oceanic and Atmospheric Administration – Storm Prediction Center Royal Meteorological Society The Tornado Project
-Flood	Cal-Adapt California Climate Adaptation Planning Guide California State Multi-Hazard Mitigation Plan FEMA – Flood Map Service Center Journal of the American Water Resources Association Target Science – Los Angeles River History US Geological Survey - Overview of the ARkStorm Scenario Western Regional Climate Center

LHMP Section	Sources of Information
-Disease/Pest Management	California Climate Adaptation Planning Guide California Department of Public Health California State Multi-Hazard Mitigation Plan City of South Gate – General Plan Los Angeles County Agricultural Commissioner’s Office
-Dam Failure	US Army Corps of Engineers
3.5 Vulnerability Summary	Analysis based on sources referenced above
4.1 Hazard Mitigation Overview	City of South Gate – Municipal Code FEMA – National Flood Insurance Program
4.2 Hazard Mitigation Measures	LHMP Team, Best Practices, FEMA Requirements
4.3 Capabilities Assessment	City of South Gate – Administrative Services Department

CHAPTER 2: COMMUNITY PROFILE

2.1 Physical Setting

South Gate is located in southeastern Los Angeles County, approximately 8 miles southeast of downtown Los Angeles, and covers an area slightly more than 7 square miles. It is bordered by the unincorporated community of Walnut Park and the Cities of Huntington Park, Cudahy, and Bell Gardens to the north, the City of Downey to the east, the Cities of Lynwood and Paramount to the south, and the City of Los Angeles and the unincorporated community of Florence-Graham to the east. The Los Angeles River and Interstate 710 (the Long Beach Freeway) run north–south through South Gate in the eastern part of the City, and Interstate 105 (the Century Freeway) runs through a small portion of the City in its extreme southeastern corner. The US Census reported that South Gate had a population of 94,396 in 2010, and 2015 estimates from the state of California put the City population at 96,547. Figure 2 depicts South Gate’s regional location.

South Gate is part of the Gateway Cities region of Los Angeles County. The community is almost entirely developed; vacant land occupies only 1.7 percent (80 acres) of South Gate’s total size. Residential land uses, primarily single-family homes, account for 41 percent (approximately 1,960 acres) of the City.

2.2 History

The area now known as South Gate was originally inhabited by the Tongva (also known as the Gabrieleño) and other Native American peoples, who settled the Los Angeles Basin and the southern Channel Islands. Spanish explorers first entered the region in 1542, but permanent occupation by Europeans would not begin until Mission San Gabriel Arcángel was constructed in 1771 in what is now the City of San Gabriel. In 1810, King Joseph I of Spain granted close to 30,000 acres of the region to Corporal Antonio Maria Lugo as a reward for his military service, forming an estate called Rancho San Antonio. Beginning in 1855, the rancho was split up, and much of it was turned into 40-acre parcels for agriculture. By 1880, cattle ranching took hold in the area. In the early 1900s, residential subdivisions began to replace the cattle ranches. The community became known as Southgate Gardens, due to its position around the southern gate of the former Rancho San Antonio.

Southgate Gardens incorporated in 1923, as the City of South Gate, with a population of approximately 2,500 people. The new City became home to many major industrial companies, including General Motors and Firestone Tires. New developments quickly sprung up in the area to provide housing for factory workers. This history is reflected in the housing stock; the 2010 US Census reports that approximately 82 percent of homes in South Gate were constructed before 1970, and over 30 percent were built during the 1940s.

Figure 2. Regional Vicinity Map



2.3 Community Profile

South Gate had a population of 94,396 people in 2010, according to the US Census. Tables 3, 4, 5, and 6 provide an overview of the City's population, households, ethnicity, and education levels based on the 2010 Census.

Table 3. South Gate Population Data (2010)

Category	Population
Total population	94,396
Male population	46,321
Female population	48,075
Median age	29.4
Elderly population (65+)	6,623
Source: US Census 2010	

Table 4. South Gate Household Data (2010)

Category	Population
Number of households	23,838
Number of families	20,833
Average household size	3.97
Average family size	4.24
Number of female householders	5,065
Median household income	\$43,268
Median family income	\$44,986
Median house value	\$376,700
Number of rental households	13,210
Source: US Census 2010	

Table 5. South Gate Ethnicity (2010)

Ethnicity	Number	Percent of Population
White (non-Hispanic)	3,209	3.4%
Black or African American	890	0.9%
American Indian and Alaska Native	878	0.9%
Asian	732	0.8%
Native Hawaiian and other Pacific Islander	99	0.1%

Ethnicity	Number	Percent of Population
Other race	40,624	43.0%
Two or more races	3,528	3.7%
Hispanic or Latino (of any race)	89,442	94.8%

Source: US Census 2010

Table 6. South Gate Educational Attainment (2010)

Educational Attainment (Age 25+)	Number	Percent of Population
Less than 9 th grade	17,754	33.2%
9 th grade to 12 th grade	8,381	15.7%
High school graduate	13,912	26.0%
Some college, no degree	7,270	13.6%
Associate degree	2,493	4.7%
Bachelor degree	2,704	5.1%
Graduate or professional degree	896	1.7%

Source: US Census 2010

2.4 Economic Trends

The nature of South Gate's economy has changed as manufacturing and heavy industry have declined in recent decades. According to the Southern California Association of Governments (SCAG), the education, retail, and manufacturing sectors provide the most jobs in the community (approximately 59 percent, as of 2013). Household median income has decreased since 2010, and as of 2014 was \$40,454 according to SCAG, compared to \$53,125 for all of Los Angeles County. As with much of California, home prices in South Gate peaked around 2006 and 2007 with a median sales price of \$460,000. Due to the collapse of the subprime housing market and the resulting global recession, home sale prices fell significantly, reaching as low as \$230,000 in 2011. Prices have risen as the economy has recovered, and as of 2014 the median home sale price was \$310,000.

Like many smaller communities surrounding major cities, more people commute out of South Gate than commute in. The US Census reports that, as of 2012, 19,285 people who lived in other communities worked in South Gate, while 26,623 South Gate residents worked in other communities. Only 1,648 South Gate residents worked in the City. Among people with jobs in South Gate who lived elsewhere, the largest number came from Los Angeles, Long Beach, Downey, Lynwood, and East Los Angeles. Among South Gate residents who worked elsewhere, the largest numbers went to Los Angeles, Vernon, Long Beach, Downey, and Commerce.

2.5 Existing Land Uses

The South Gate General Plan, which was adopted in 2009 and is the principal policy document regulating land use in the City, identifies nine main types of land uses in the community. Like much of the region, South Gate has gone from a largely agricultural community in its earlier history to a largely built-out urban community. Table 7 shows the current distribution of land uses in South Gate.

Table 7. Current Land Uses In South Gate

Land Use	Acres	Percent of Total	Example
Vacant	80	1.7%	Undeveloped/abandoned land
Civic/Institutional	99	2.1%	Local government buildings, religious facilities
Schools	109	2.3%	Elementary schools, high schools, adult school campuses
Parks	166	3.4%	South Gate Park, Hollydale Regional Park
Commercial	308	6.4%	Retail stores, auto dealers, restaurants, offices
Public Works, Water Bodies, Easements	342	7.1%	Los Angeles River, power lines, flood control channels, railways
Industrial	762	15.9%	Heavy manufacturing, light industry, warehouses
Transportation	968	20.2%	Roads
Residential	1,966	41.0%	Single-family homes, multifamily units, mobile home parks
Total	4,800	100%	

Source: City of South Gate

2.6 Development Trends

Numerous development projects are under way or in the planning stages in the City. Table 8 identifies current development activities in the City.

2.7 Critical Facilities

The project team identified a number of critical facilities in South Gate. These facilities provide important services to the community, such as basic government functions, water and power service, and schools. Some of these facilities can also serve additional roles during an emergency situation, including as a shelter for displaced residents, a staging area for emergency response and recovery activities, or a location for important City administration functions. Damage to these facilities can impair response and recovery operations, and may lead to a disruption of vital services for South Gate residents. The City also identified a number of bridges in the planning area, which may be owned by non-local

government agencies but are included in the risk assessment maps due to their importance. Table 9, Table 10, and Figure 3 show the critical facilities and bridges in South Gate.

Table 8. 2015 Development Activities

Project	Location	Description	Estimated Completion
Tweedy Atlantic Plaza	9918 Atlantic Ave. (SE corner of Tweedy/Atlantic)	Proposed project to convert existing industrial buildings into a neighborhood shopping center with approximately 7 tenants which include Bright Now! Dental, Winchell's, Baskin-Robbins, and Cricket.	Winter 2016
La Aldea	9923 Atlantic Ave. (SW corner of Tweedy/Atlantic)	A proposed 5-story mixed-use project on the formerly occupied site by Adohr Farms. The project will feature 105 market-rate apartments and approximately 35,000 square feet of retail.	Summer 2018
Alta Med (Medical Facility)	8627 Atlantic Ave.	New 2-story, 28,961-SF medical facility, just north of the Azalea Shopping Center. The facility will provide a pharmacy, X-ray accommodations, labs, dental office/exam rooms, and separate areas for sick and well patients, and will accommodate between 150–170 people.	Summer 2017
Chakemco Plaza	10000 Atlantic Ave.	New neighborhood retail center with approximately 5,800 SF of retail. Replacing an existing used truck dealership and will sit adjacent to the new Atlantic/Tweedy retail center.	Fall 2017
7-Eleven	10840 Garfield Ave.	New 2,000-SF 7-Eleven at the NE corner of Garfield Avenue and Imperial Highway.	Summer 2017
Gardendale Condos	5495 Gardendale Ave.	7 condominiums at approximately 1,700 SF each.	Fall 2018
State Apartments	8148 State Street	10 new apartments units at approximately 1,200 SF each.	Summer 2017
Willow Apartments	2742 Firestone Blvd.	7 unit apartment located next to Willow Elementary School.	Fall 2017
Paramount Apartments	SE corner of Golden/Paramount	10 unit apartment project.	Fall 2017
Rincon Taurino	4680 Firestone Blvd.	Tenant improvements to an existing restaurant to include an open patio.	Summer 2017
K-Pac	9415 Burtis Street	New 86,000-SF industrial building with 4,000 SF of office space.	Summer 2017

Source: City of South Gate

Table 9. South Gate Critical Facilities

Map Number	Facility Name	Location
1	City of South Gate Civic Center (includes Police Department)	8620-8650 California Avenue
2	Parks & Recreation - Administration	4900 Southern Avenue
3	Parks & Recreation - Hollydale Community Resource Center	12221 Industrial Avenue
4	Parks & Recreation - South Gate Girls Clubhouse	4940 Southern Avenue
5	Parks & Recreation - South Gate Golf Course	9615 Pinehurst Avenue
6	Parks & Recreation - South Gate Senior Center	4855 Tweedy Boulevard
7	Parks & Recreation - South Gate Sports Center	9520 Hildreth Avenue
8	Parks & Recreation - Westside Community Resource Center	9200 State Street
9	Public Works Corporate Yard	4244 Santa Ana Street
10	L.A. County Fire Station #54	4867 Southern Place
11	L.A. County Fire Station #57	5720 Gardendale Avenue

Table 10. South Gate Bridges

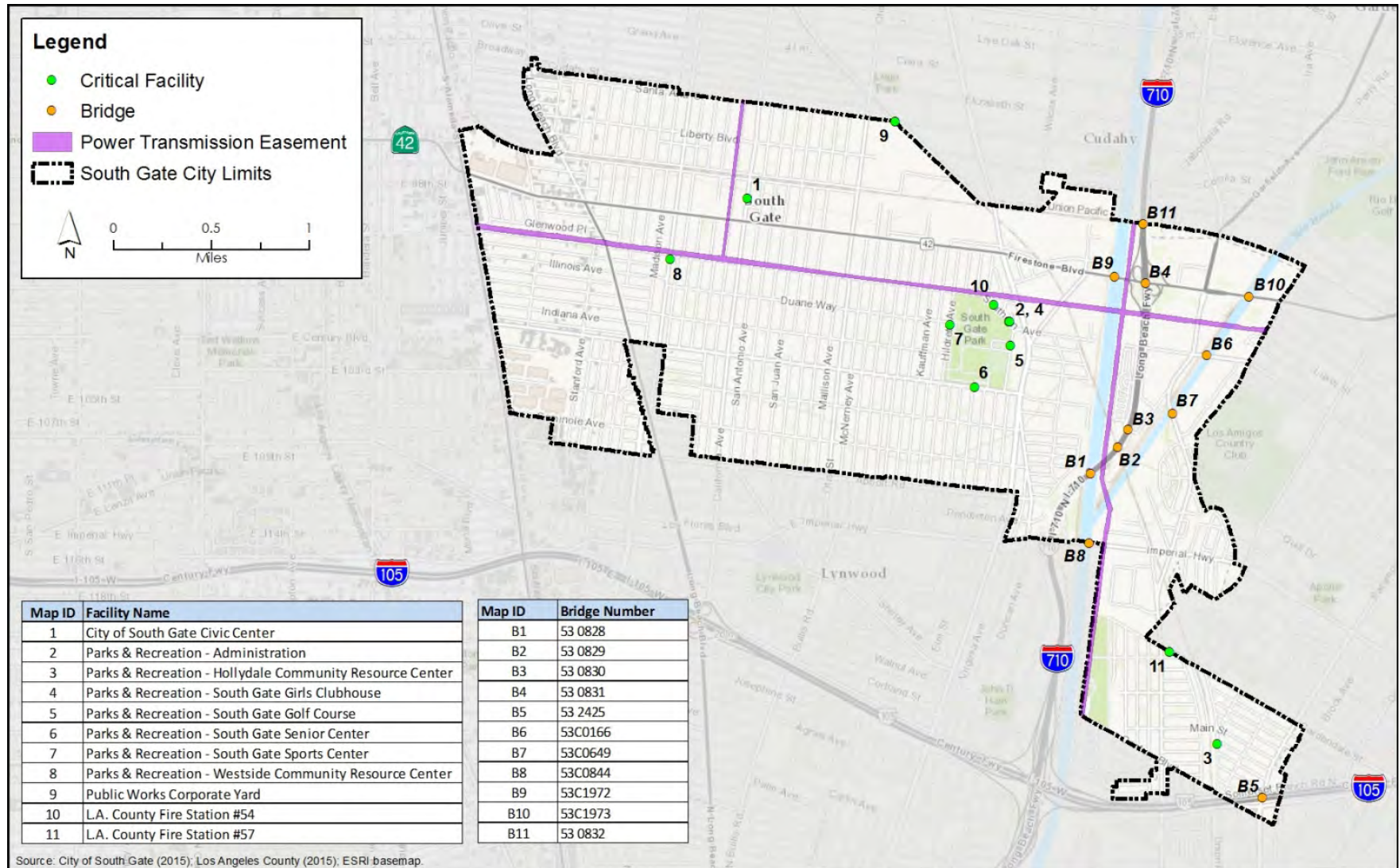
Map Number	Bridge Number
B1	53 0828
B2	53 0829
B3	53 0830
B4	53 0831
B5	53 2425
B6	53C0166
B7	53C0649
B8	53C0844
B9	53C1972
B10	53C1973
B11	53 0832

The City has a number of critical facilities that could be vulnerable to human attacks. In order to maintain safety, the City has removed these confidential facilities from the publicly accessible LHMP. A separate risk assessment has been conducted and is kept by the City under separate file. In addition to the Critical Facilities list, the LHMP Team also identified “Facilities of Concern,” which are the schools located in the community. Appendix C provides a detailed list of all nonconfidential facilities identified by the LHMP Team. The risk assessment prepared for this plan is based solely on the facilities listed in Table 9.

2.8 Disaster and Evacuation Routes

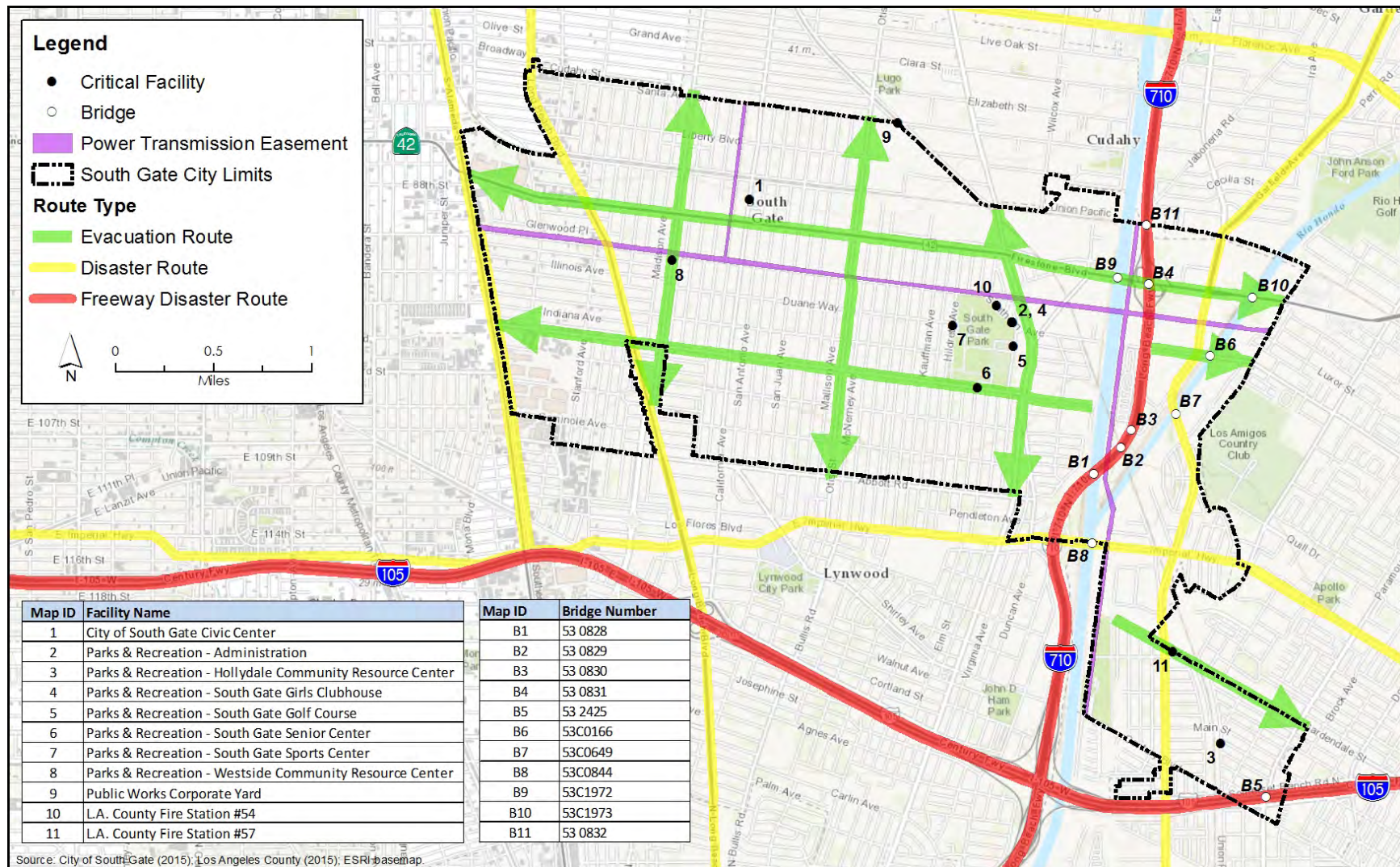
In the event of a significant emergency, clear routes are needed to ensure that emergency responders and supplies can be transported to the disaster and that community members can be evacuated away from the disaster. The County of Los Angeles designates official disaster routes. Disaster routes in or near the planning area include Interstate 710 and 105, as well as Alameda Street, Long Beach Boulevard, Imperial Highway, Garfield Avenue, and Florence Avenue. The City of South Gate designates its own evacuation routes, which include Firestone Boulevard, Tweedy Boulevard, Southern Avenue, Gardendale Street, Atlantic Avenue, Otis Street, and California Avenue. Figure 4 displays these disaster and evacuation routes.

Figure 3. South Gate Critical Facilities and Bridges



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Figure 4. South Gate Evacuation Routes



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CHAPTER 3: HAZARD PROFILES

3.1 Hazard Identification and Prioritization

Hazard Identification

FEMA identifies 21 different hazards that local governments may wish to consider when conducting hazard mitigation planning efforts. Some of these events effectively cannot occur in South Gate because the community does not have the necessary attributes for these events to occur (avalanches, for example). Other potential hazards may potentially occur in South Gate but the chance of such events is low enough that planning for these occurrences is not an effective use of resources (hurricanes, for example). The LHMP Team discussed a comprehensive list of natural hazards during the kickoff meeting on July 14, 2015. This discussion resulted in identification of the hazards that pose a potential risk to the City of South Gate. Table 11 summarizes the LHMP Team's discussion for each of the natural hazards and shows which were identified for inclusion in this LHMP. Hazards that have been excluded from further consideration are shaded gray. This table is consistent with the hazards identified as part of FEMA's hazard mitigation planning guidance.

Table 11. City of South Gate Hazard Identification, 2015

List of Hazards	Include in City LHMP?	Discussion Summary
Dam Failure	Yes	The City is susceptible to inundation caused by dam failure of Garvey, Whittier narrows, and Hansen Dams along the Los Angeles and Rio Hondo Rivers.
Disease and Pest Management	Yes	Trees in the City are susceptible to invasive insects and fungi.
Drought	Yes	The City depends on groundwater and imported surface water, both of which are susceptible to drought.
Seismic Hazards (Ground Shaking and Liquefaction)	Yes	South Gate is susceptible to earthquake ground shaking and liquefaction.
Extreme Heat	Yes	Due to economic considerations and the relative lack of shade trees in parts of the City, the City is vulnerable to extreme heat events.
Flood	Yes	The City has 100- and 500-year flood zones, as mapped by FEMA.
Hailstorm	Yes	Though rare, the City has experienced substantial hail damage in the past. The hazard will be combined with similar hazards and identified as "severe weather."
Hazardous Materials Spills	Yes	The City contains properties and transportation corridors with the potential for hazardous materials spills.

List of Hazards	Include in City LHMP?	Discussion Summary
Tornado	Yes	Tornados are rare, but have occurred near the City. The hazard will be combined with similar hazards and identified as "severe weather."
Wind	Yes	The City has experienced damage from wind events. The hazard will be combined with similar hazards and identified as "severe weather."
Windstorm	Yes	The City has experienced damage from wind events. The hazard will be combined with similar hazards and identified as "severe weather."
Climate Change	Yes	Climate change is not profiled as a distinct hazard, but rather a phenomenon that could exacerbate hazards. Climate change will be considered as a factor for relevant identified hazards.
Agricultural Pests	No	Not applicable. There is no agriculture in South Gate.
Avalanche	No	Not applicable. The conditions for avalanche are not present in South Gate.
Coastal Erosion/Bluff Failure	No	Not applicable. South Gate is not a coastal community.
Coastal Storm	No	Not applicable. South Gate is not a coastal community.
Expansive Soils	No	Not applicable. There are no expansive soil issues in South Gate.
Hurricane	No	Not applicable. There are no historical or expected occurrences of hurricane in South Gate.
Land Subsidence	No	Not applicable. There are no historical or expected occurrences of subsidence in South Gate.
Landslide and Mudflow	No	Not applicable. The conditions for landslides and mudflows are not present in South Gate.
Human Caused Hazards	No	Except for hazardous materials spills, this plan focuses on natural hazards, per FEMA requirements.
Severe Winter Storm	No	Not applicable. Although severe winter storms do happen in South Gate, their impacts are adequately captured in other hazards reviewed in this plan and do not include those impacts typically associated with winter storms elsewhere in the nation such as snow, blizzards, sleet, etc.
Tsunami	No	Not applicable. South Gate is not a coastal community.
Volcano	No	Not applicable. There are no volcanoes in or near South Gate.
Wildfire	No	Not applicable. South Gate is a built-out urban community, surrounded by built-out urban communities; there are no wildfire risks in the City.
Sea Level Rise	No	Not applicable. South Gate is not a coastal community.

Some of the hazards listed in this plan combine FEMA-identified hazards for organizational purposes. For example, this plan discusses “severe weather,” which includes wind/windstorms, hailstorm, and tornados. City staff identified and prioritized eight hazards that may impact South Gate:

- Drought
- Seismic Hazards
- Extreme Heat
- Hazardous Materials
- Severe Weather
- Flood
- Disease/Pest Management
- Dam Failure

Prioritization

The LHMP Team used a Microsoft Excel-based tool to prioritize the identified hazards by assigning each hazard a ranking based on probability of occurrence and potential impact. These rankings were assigned based on group discussion, knowledge of past occurrences, and familiarity with the City’s infrastructure vulnerabilities. Four criteria were used to establish priority:

- Probability (likelihood of occurrence)
- Location (size of potentially affected area)
- Maximum Probable Extent (Primary Impact, or intensity of damage)
- Secondary Impacts (severity of impacts to community)

A value of 1–4 was assigned for each criterion, with 4 being the most severe and 1 being the least. The four criteria were then weighted based on the LHMP Team’s opinion of each criterion’s importance. Table 12 shows the scores for each criterion.

Table 13 presents the results and includes only those hazards that achieved a “medium” or “high” score. The hazards in Table 13 are consistent with the hazards identified in Table 11. Note that for organizational purposes, hailstorm, wind/windstorm, and tornado have been combined into a single category referred to here as “severe weather.”

Table 12. Hazard Ranking Scores and Weighing Factors

Probability		Maximum Probable Extent (Primary Impact)	
Based on estimated likelihood of occurrence from historical data	Weighing Factor: 2.0	Based on percentage of damage to typical facility in community	Weighing Factor: 0.7
<u>Probability</u>	<u>Score</u>	<u>Impact</u>	<u>Score</u>
Unlikely	1	Weak – little to no damage	1
Occasional	2	Moderate – some damage, loss of service for days	2
Likely	3	Severe – devastating damage, loss of service for months	3
Highly likely	4	Extreme – catastrophic damage, uninhabitable conditions	4

Location		Secondary Impacts	
Based on size of geographical area of community affected by hazard	Weighing Factor: 0.8	Based on estimated secondary impacts to community at large	Weighing Factor: 0.5
<u>Affected Area</u>	<u>Score</u>	<u>Impact</u>	<u>Score</u>
Negligible	1	Negligible – no loss of function, downtime, and/or evacuations	1
Limited	2	Limited – minimal loss of function, downtime, and/or evacuations	2
Significant	3	Moderate – some loss of function, downtime, and/or evacuations	3
Extensive	4	High – major loss of function, downtime, and/or evacuations	4

Table 13. South Gate Hazard Ranking Worksheet Outcomes

Hazard Type	Probability	Impact			Total Weighted Score	Hazard Planning Consideration
		Location	Primary Impact	Secondary Impacts		
Drought	4	4	4	4	64.00	High
Seismic Hazards	4	4	4	4	64.00	High
Extreme Heat	4	4	3	2	50.40	High
Hazardous Materials	3	4	3	4	43.80	High
Severe Weather	3	4	3	4	43.80	High
Flood	3	2	3	4	34.20	Medium
Disease/Pest Management	4	2	1	2	26.40	Medium
Dam Failure	1	4	3	4	14.60	Medium

3.2 Climate Change Considerations

Climate change is expected to exacerbate existing hazards in the City. As such, the LHMP Team determined that it would be best to discuss climate change considerations throughout all applicable hazard profiles. To address potential climate change impacts, the City has identified climate change considerations in each hazard profile. This discussion is intended to supplement, but not replace, the “Risk of Future Hazards” discussion.

3.3 Vulnerability/Risk Assessment Method

The critical facilities listed in Section 2.7 were mapped in GIS and overlaid with mapped hazard areas to determine which assets are located within each hazard area. Hazard area and critical facility overlays were conducted for seismic hazards (liquefaction), hazardous materials, flood, and dam failure.

Hazard and critical facility overlays were not conducted for drought, extreme heat, severe storms, or disease/pest management. These hazards affect the entire City and therefore all facilities listed in the critical facility inventory could be potentially susceptible to damage from them.

Each hazard profile in the following section includes a Vulnerability/Risk Assessment section that presents the results of the method described above. Replacement and contents values for the facilities that fall within the hazard areas are tallied in each vulnerability table to estimate the total potential losses to each facility. It should be noted that the actual losses will depend on the type and extent of the hazard event.

3.4 Hazard Profiles

Drought

Hazard Description

A drought is a long-term shortage of water, usually caused by extended periods with little or no precipitation. Unlike the other emergencies discussed here, droughts develop over a lengthy period of time. It generally takes multiple dry years to develop a drought, and similarly it can take multiple wet years to alleviate one. In urban areas, drought conditions can cause a decrease in available water supplies, which may lead to increases in water rates or restrictions in water use. Communities may need to seek alternative water supplies to meet demand, which can be a costly and lengthy process. Vegetation, including street trees and landscaped areas in public parks, can become water stressed if it is not adapted to drought conditions, which may result in plant disease or death.

There are multiple scales for measuring the severity of droughts. The US Drought Monitor Classification Scheme combines many of these scales into a single index, shown in Table 14.

Table 14. US Drought Monitor Classification Scheme

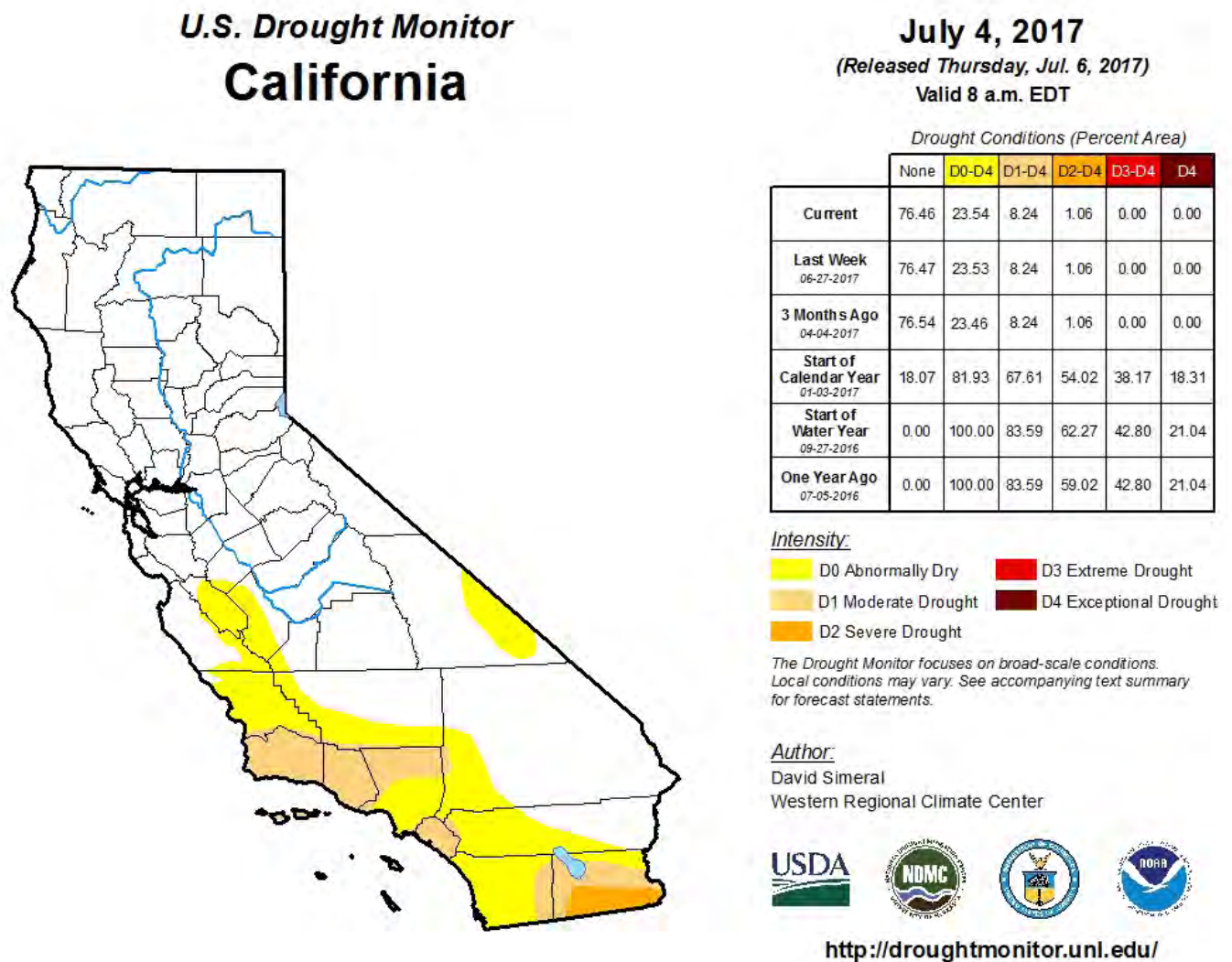
Category	Description	Possible Impacts
D0	Abnormally dry	Slower growth of crops and pastures compared to normal activities.
D1	Moderate drought	Some damage to crops and pastures. Streams, reservoirs, or wells low. Some water shortages may be developing or imminent.
D2	Severe drought	Likely crop and pasture losses. Water shortages are common, leading to restrictions.
D3	Extreme drought	Major crop and pasture losses. Widespread water shortages.
D4	Exceptional drought	Exceptional and widespread crop and pasture losses. Emergency shortages develop.

Source: US Drought Monitor, <http://droughtmonitor.unl.edu/AboutUs/ClassificationScheme.aspx>

Hazard History

Droughts are a relatively frequent event in California, and many native plants and animals have evolved strategies to deal with long-term water shortages. Due to California's extensive water infrastructure networks, a drought in one part of the state may have a relatively small impact if the water supply in the affected area comes from another location that is not under drought conditions. Occasionally the state may experience a widespread drought that lasts for multiple years. A drought from 1928 to 1937 affected all parts of the state and was the longest drought in California's recorded history. Since 2012, California has been experiencing drought conditions statewide. This drought is among the most severe in the state's history (by some measures it is the most severe in 1,200 years) and sparked widespread restrictions on water use. As of July 2017, a majority of the state was out of this drought with portions of southern California experiencing (including South Gate) abnormally dry conditions (Figure 5).

Figure 5. California Drought Conditions, July 2017



Risk of Future Hazards

Because South Gate lacks any substantive agricultural activities, the primary impact of drought conditions in the City is on the local water supply. South Gate has two water providers: most of the community receives its water from the City-owned network, while a small portion, home to over 1,400 service connections, receives water from the private Golden State Water Company's Hollydale System. In most years the City supplies water from its existing groundwater allocation of 11,183 acre-feet (AF). Only in rare occasions does the City rely on water sources outside of their current groundwater allocation and hasn't relied upon outside sources for a number of years. The City's 2015 Urban Water Management Plan identifies eleven groundwater wells, seven of which are active. Of the four remaining wells, three are reserved for standby use and the remaining well is currently inactive due to contamination and reliability issues. The City's groundwater allocation is currently pumped through these seven active wells, which has generally proven sufficient to

meet City needs. If additional water is needed, it would be supplied by the Metropolitan Water District (MWD) of Southern California. MWD's water is imported from the Colorado River and the northern Sierra Nevada, and supplemented by groundwater and other local sources. Since the City's current water demand is less than their groundwater allocation, on a yearly basis, the City regularly stores, leases, and rolls over groundwater supplies to ensure adequate future water supplies are available for future years. This active management conducted by both the City and the Water Replenishment District (groundwater management entity) ensure that groundwater supplies within the City are more resilient than other jurisdictions throughout California.

As most of South Gate's water supply comes from local groundwater sources, local drought conditions have the greatest impact to the community. A long-term lack of precipitation within southern California reduces the amount of water that filters through the soil and becomes groundwater, potentially reducing available groundwater supplies. However, the efforts of the City and WRD are ensuring that these impacts are reduced to the greatest extent possible through groundwater replenishment, water conservation, and additional projects that reduce groundwater vulnerability in the region. Although the City is less dependent on imported water supplies and therefore less vulnerable to droughts in other areas, such droughts may still pose challenges during times when South Gate must supplement its water supply with water purchased from MWD.

Climate Change Considerations

Scientific evidence suggests that precipitation levels in California will decrease as a result of climate change. At the same time, warmer temperatures brought on by climate change are expected to increase the rate of evaporation from bodies of water, further decreasing the amount of available water. It is likely that drought conditions will become more frequent and more severe as a result of climate change. Research linking a specific weather event to climate change has been sparse; however, some studies have found that there may be a connection between climate change and the drought conditions in California since 2012.

Vulnerability/Risk Assessment

As described above, the City of South Gate obtains potable water primarily from locally pumped groundwater. The entire City, and the county as a whole, is highly vulnerable to drought, however through active management, the City's groundwater basin has proven to be resilient to the most recent drought, with groundwater elevations increasing over the past couple of years. The 2015 Urban Water Management Plan sets forth a path for the City to reduce per capita water use 20 percent by 2020, which would make the City more resilient to drought. Since droughts are not likely to cause physical or structural damage to critical facilities, potential losses were not quantified. However, it should be noted that loss of water supplies as a result of drought could exacerbate the effects of other hazards like extreme heat and disease/pest management, and response to hazard events in general. Given the current water demand in the City (and the excess water supply available), this vulnerability is anticipated to be effectively managed for years to come by the programs and initiatives implemented by WRD.

Seismic Hazards

Hazard Description

Seismic hazards occur when accumulated stress between portions of the earth's crust is released, resulting in the sudden ground movement that is perceived as an earthquake. Primary seismic hazards are the direct result of this released stress, and include earthquake fault rupture (the displacement of the ground surface at the site of the earthquake) and seismic shaking (the ground movement itself, which occurs over a wide area beyond the site of the earthquake). Earthquakes can also cause secondary seismic hazards, such as liquefaction and landslides, which are triggered by the fault rupture or seismic shaking.

Description of Primary Seismic Hazards

Seismic activity is most commonly connected with faults, which are areas where large sections of earth's crust called tectonic plates move past each other. The movement of the tectonic plates causes the stress and strain that leads to earthquakes. Deformation of the plates and accumulated stress between them can cause faults and earthquakes to occur over a much broader area than the precise boundary between the plates. In California, the Pacific and North American plates are sliding horizontally past each other, creating what is known as a "strike-slip fault." The boundary between the two plates is known as the San Andreas Fault, although the stress caused by this movement has created thousands of fault areas throughout the state. Most of California lies on the North American plate, although the coastal areas of Central and Southern California, including South Gate, sits on the Pacific plate.

Major earthquakes in California occur less frequently than some other disasters; for the years 1950 to 2012, the state Multi-Hazard Mitigation Plan identifies 178 fire emergencies, 129 flood emergencies, and 23 earthquake emergencies. Although they are the third-largest cause of emergency-related death during this period (with 193 deaths, or approximately 20 percent of all state emergency-related deaths), earthquakes were the largest source of emergency-related injuries and costs.

There are two scales commonly used by scientists to measure earthquakes: the moment magnitude scale and the Mercalli intensity scale. The moment magnitude scale is based on the now largely unused Richter scale and measures the amount of energy released by the earthquake. The Mercalli intensity scale measures the effects of the earthquake, and is based on qualitative observations rather than a rigorous quantitative calculation. Table 15 shows the different categories of the Mercalli intensity scale.

Table 15. Mercalli Intensity Scale

Scale	Intensity	Description
I	Instrumental	Not felt, except by a very few people under especially favorable conditions.
II	Feeble	Felt only by a few people at rest, especially on the upper floors of buildings.
III	Slight	Noticeable by people indoors, especially on the upper floors of buildings, although it is not widely recognized as an earthquake. Parked vehicles may move slightly.
IV	Moderate	Felt indoors by many and felt outdoors by some. May awaken sleeping people. Dishes, windows, and doors disturbed. Parked vehicles move noticeably.
V	Slightly Strong	Felt by almost everyone. Sleeping people awakened, and some dishes and windows broken. Unstable objects overturned, and pendulum clocks may stop.
VI	Strong	Felt by everyone. Some heavy furniture moved, and some instances of falling plaster. Damage slight, although many people may be frightened.
VII	Very Strong	Considerable damage in poorly built or badly designed structures, slight to moderate damage in well-built ordinary structures, and negligible damage in buildings of good design and construction. Some chimneys broken.
VIII	Destructive	Great damage in poorly built structures, considerable damage and partial collapse in well-built ordinary structures, and slight damage in specially designed structures. Chimneys, factory stacks, columns, monuments, and walls fall. Heavy furniture overturned.
IX	Ruinous	Well-designed structures thrown out of plum, considerable damage in specially designed structures. Substantial buildings suffer great damage and partial collapse. Buildings shifted off of foundations.
X	Disastrous	Some well-built wood structures destroyed. Most masonry and frame structures and foundations destroyed. Rails bent.
XI	Very Disastrous	Few if any masonry structures remain standing. Bridges destroyed and rails greatly bent.
XII	Catastrophic	Total damage. Lines of sight and level are distorted. Objects thrown into the air.

Source: US Geological Survey, http://earthquake.usgs.gov/learn/topics/mag_vs_int.php

The moment magnitude and Mercalli intensity scales measure different elements of an earthquake. They do not precisely correlate to each other, although an approximate comparison is given in Table 16.

Table 16. Comparison of Moment Magnitude and Mercalli Intensity Scales

Moment Magnitude	Mercalli Intensity
1.0 to 3.0	I
3.0 to 3.9	II to III
4.0 to 4.9	IV to V
5.0 to 5.9	VI to VII
6.0 to 6.9	VII to IX
7.0 and greater	VIII and greater

Source: US Geological Survey, http://earthquake.usgs.gov/learn/topics/mag_vs_int.php

Description of Secondary Seismic Hazards

Beyond the direct damage from the ground shaking posed by an earthquake, these events can also result in a seismic hazard called liquefaction, which occurs when the force of an earthquake's shaking causes groundwater to mix with the soil. This mixture temporarily becomes a fluid and loses its strength, which may in turn cause buildings and other structures built on or in it to tilt, collapse, or otherwise suffer damage. Liquefaction can also occur independently of an earthquake, if any other sudden and significant stress causes the mixing of groundwater and soil. The risk of liquefaction depends on many different factors, including the height of the groundwater table and the types of soil in an area.

Earthquakes can also cause landslides, either directly as a consequence of the ground shaking or indirectly when soil loses its structural integrity due to liquefaction. Landslides can occur under multiple conditions, but they are most likely in areas with steep slopes with highly fractured rocks, areas with loose and weak soils, and areas on or near deposits of material caused by previous landslides.

Damage caused by seismic hazards, either primary or secondary, can create other hazardous conditions. Seismic hazards can damage natural gas pipelines, causing gas leaks that can ignite and cause an urban fire. Broken water lines can cause localized flooding, and damages to wastewater pipes may create a public health hazard. Earthquakes may also damage containers that hold hazardous materials, leading to a hazardous materials release emergency.

Hazard History – Primary Seismic Hazards

Four large earthquakes have occurred around South Gate in recent history:

- In 1933, an earthquake off the coast of Long Beach measured an estimated 6.4 on the moment magnitude scale with an estimated Mercalli intensity of VIII. This earthquake killed 115 people, largely in southern Los Angeles and Long Beach, although five people were killed in South Gate and multiple buildings were destroyed.
- The 1971 San Fernando earthquake in the San Gabriel Mountains measured 6.5 on the moment magnitude scale and XI on the Mercalli intensity scale, killing 64 people and causing extensive damage to freeway structures and buildings.

- In 1987, an earthquake near Rosemead in the San Gabriel Valley, with a moment magnitude of 5.9 and a Mercalli intensity of VIII, killed three people and was widely felt throughout Southern California.
- The Northridge earthquake in 1994 measured 6.7 on the moment magnitude scale with a Mercalli intensity of IX. It killed 57 people, caused over 5,000 injuries, and spawned multiple strong aftershocks. This earthquake caused an estimated \$20 billion or more in damages.

Hazard History – Secondary Seismic Hazards

The California Department of Conservation has not definitively noted historic instances of liquefaction in South Gate. However, such events were observed in the nearby City of Compton during the 1933 Long Beach earthquake. It is possible that some of the damage that occurred in South Gate and other nearby communities during the 1933 earthquake was linked to liquefaction. Liquefaction has caused significant damage as part of many earthquakes in California history, including the 1971 San Fernando earthquake and the 1994 Northridge earthquake. There are no historic instances of landslides in South Gate or in the immediate vicinity.

Risk of Future Primary Seismic Hazards

South Gate is located in a seismically active area. The Alquist-Priolo Act requires that the California Geologic Survey identify faults in the state that may pose a risk of fault rupture. These faults, known as Alquist-Priolo faults, are also capable of creating a significant ground shaking event, and include most of the major faults present in California. While there are no Alquist-Priolo faults within the City, there are a number of these faults in the surrounding area. The following active faults, most of which are designated as Alquist-Priolo faults, are located within 60 miles of the community and are capable of producing significant earthquakes:

- The Newport-Inglewood Fault Zone is made up of three distinct segments and several faults and fractures, running approximately from the Santa Monica Mountains near Beverly Hills to Newport Beach. It passes approximately 4 miles from South Gate at its closest point. The last major event along this fault was the 1933 Long Beach earthquake. The Southern California Earthquake Center estimates that a future major event along this fault could measure 6.0 to 7.4 on the moment magnitude scale. ¹
- The Palos Verdes Fault Zone extends from the Palos Verdes peninsula south into the Pacific Ocean, running approximately 12 miles from South Gate at its closest point. It has not produced a significant earthquake in recorded history. While not a major Alquist-Priolo fault, The Southern California Earthquake Center estimates that substantial activity from the fault has occurred within the past 10,000 years, and that this fault is capable of producing an earthquake measuring 6.0 to 7.0 or more on the moment magnitude scale. ²
- The Whittier-Elsinore Fault Zone runs from the Chino Hills region to the California-Mexico border, and is approximately 8 miles from South Gate at its closest point. Near Chino Hills it splits into two separate segments, the Chino Fault and the Whittier Fault. The last major event along this fault was a 1910 earthquake measuring

¹ <http://scedc.caltech.edu/significant/newport.html>

² <http://scedc.caltech.edu/significant/palosverdes.html>

an estimated 6.0 on the moment magnitude scale. This fault is believed to cause a major event approximately every 250 years with a probable magnitude of 6.5 to 7.5 on the moment magnitude scale.³

- The Sierra Madre Fault Zone runs along the southern edge of the San Gabriel Mountains from La Cañada-Flintridge to Claremont, approximately 15 miles from South Gate at its closest point. It is made up of five segments; scientists are unclear if any event along this fault could be limited to one segment or if events along multiple segments are possible. The Southern California Earthquake Center estimates that the last major event along the fault zone happened within the past 10,000 years (although no specific event is known), and suggests that it is capable of producing an event measuring 6.0 to 7.0 on the moment magnitude scale. It is not a major Alquist-Priolo fault.⁴
- The San Andreas Fault, the largest and most well-known of California's faults, runs from Cape Mendocino to the Salton Sea. It is approximately 40 miles from South Gate at its closest point. It has caused numerous major earthquakes throughout California's history, including the 1857 Fort Tejon earthquake, which had an estimated moment magnitude of 7.9 and is the strongest earthquake in California's recorded history. Approximately 225 miles of the fault ruptured during this event, including areas near the Los Angeles region. The Southern California Earthquake Center estimates that a future major event along the southern part of the San Andreas Fault, including a potential repeat of the 1857 earthquake, could measure 6.8 to 8.0 on the moment magnitude scale.⁵ The recent third Uniform California Earthquake Rupture Forecast estimates that there is at least a 19 percent chance of the southern portion of the San Andreas Fault causing a major earthquake by 2044.⁶
- The San Jacinto Fault Zone runs from San Bernardino to the Superstition Mountains south of the Salton Sea, and is approximately 45 miles from South Gate at its closest point. The last major event along this fault was the Borrego Mountain earthquake on April 9, 1968, which measured 6.8 on the moment magnitude scale. The Southern California Earthquake Center estimates that major events along this fault could measure 6.5 to 7.5 on the moment magnitude scale.⁷

The list above describes the faults most likely to produce a significant earthquake near or in South Gate. Additionally, there is a risk of earthquakes from faults that have not yet been discovered. The 1994 Northridge earthquake, which caused more property damage than any other earthquake in the United States and was the ninth most damaging earthquake in history, occurred along a then-undiscovered fault. A major earthquake along any of these faults could cause significant damage to South Gate. Figure 6 presents the City in relation to major faults, specifically the Newport-Inglewood – Rose Canyon fault zone.

Figure 7 identifies the potential for ground shaking in the City. This map shows the level of ground motion from an earthquake which has a 2 percent chance of being exceeded in the next 50 years (i.e., there is a 2 percent chance that an earthquake in the next 50 years will cause ground motion greater than what is shown in the figure). This map shows

³ <http://scedc.caltech.edu/significant/elsinore.html>

⁴ <http://scedc.caltech.edu/significant/sierramadre.html>

⁵ <http://scedc.caltech.edu/significant/sanandreas.html>

⁶ <http://pubs.usgs.gov/fs/2015/3009/pdf/fs2015-3009.pdf>

⁷ <http://scedc.caltech.edu/significant/sanjacinto.html>

the level of ground motion in short periods (0.2 second intervals), which is applicable to short, relatively stiff buildings such as the ones present in South Gate. The force of the shaking is measured as a percentage of earth's normal gravity (e.g., a shaking of 1.55 g is 155 percent that of normal gravity).

Risk of Future Secondary Seismic Hazards

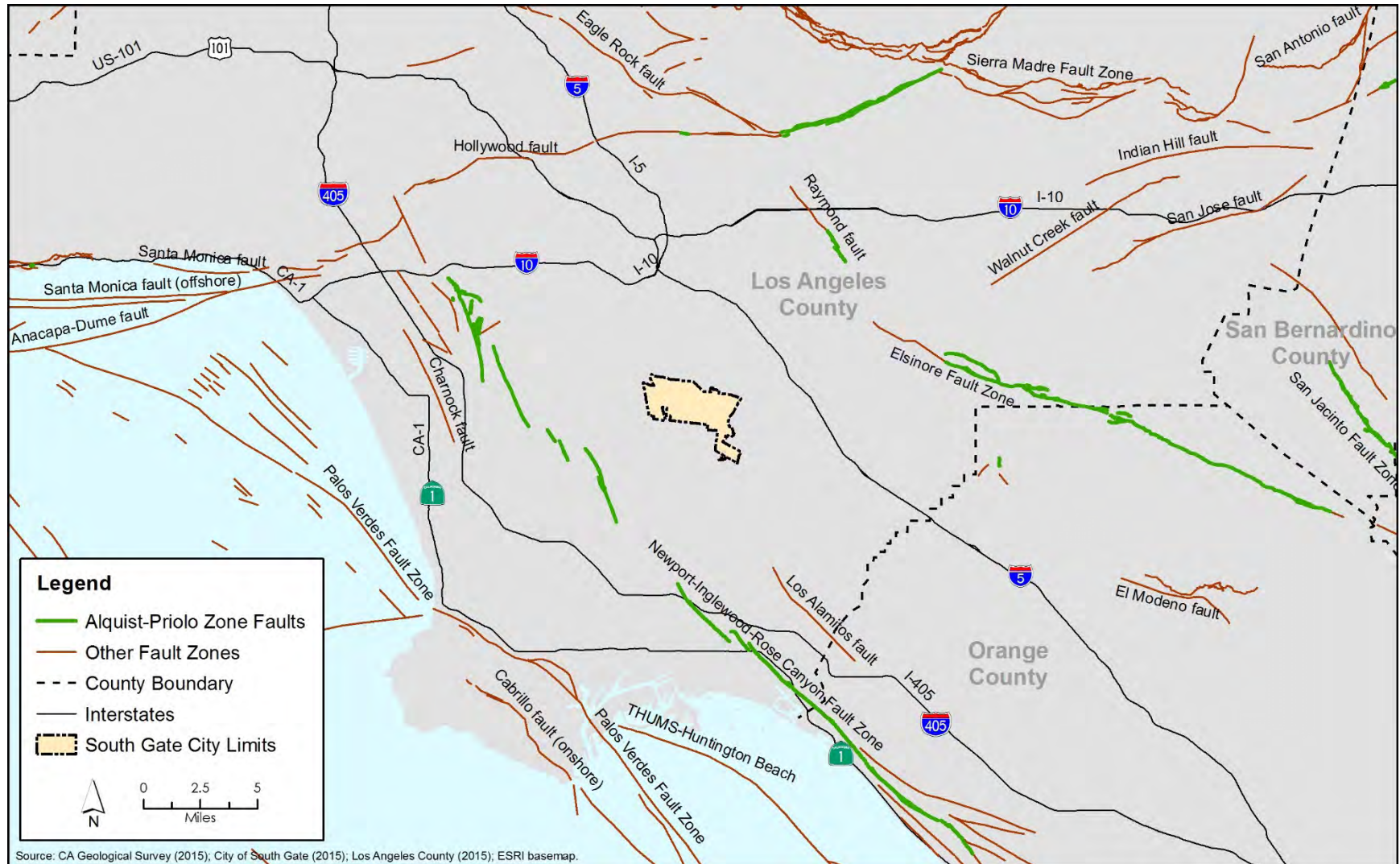
The soil under South Gate is alluvial deposits, which is material (often sand, silt, or gravel) deposited by a river. This soil type can be susceptible to liquefaction. The California Department of Conservation identifies all of South Gate being at an elevated risk for liquefaction due to these soil types and a high water table (less than 40 feet below the surface). However, South Gate City staff identifies the water table as being 80–100 feet below the surface, and does not consider liquefaction as a substantial risk in the community.

The generally flat topography of South Gate means that there are no designated zones at an elevated risk of landslides. However, there is a possibility of small landslides along the Los Angeles River, drainage channels, or other areas where steep slopes occur. Small landslides can occur during grading and other earth-moving activities if appropriate mitigation techniques are not taken. Additionally, areas such as South Gate that are at an elevated risk of liquefaction may experience a phenomenon called lateral spreading, when the liquefied soil spreads out across shallow slopes and behaves very much like a low-angle landslide. Figure 8 illustrates the liquefaction potential in the City.

Climate Change Considerations

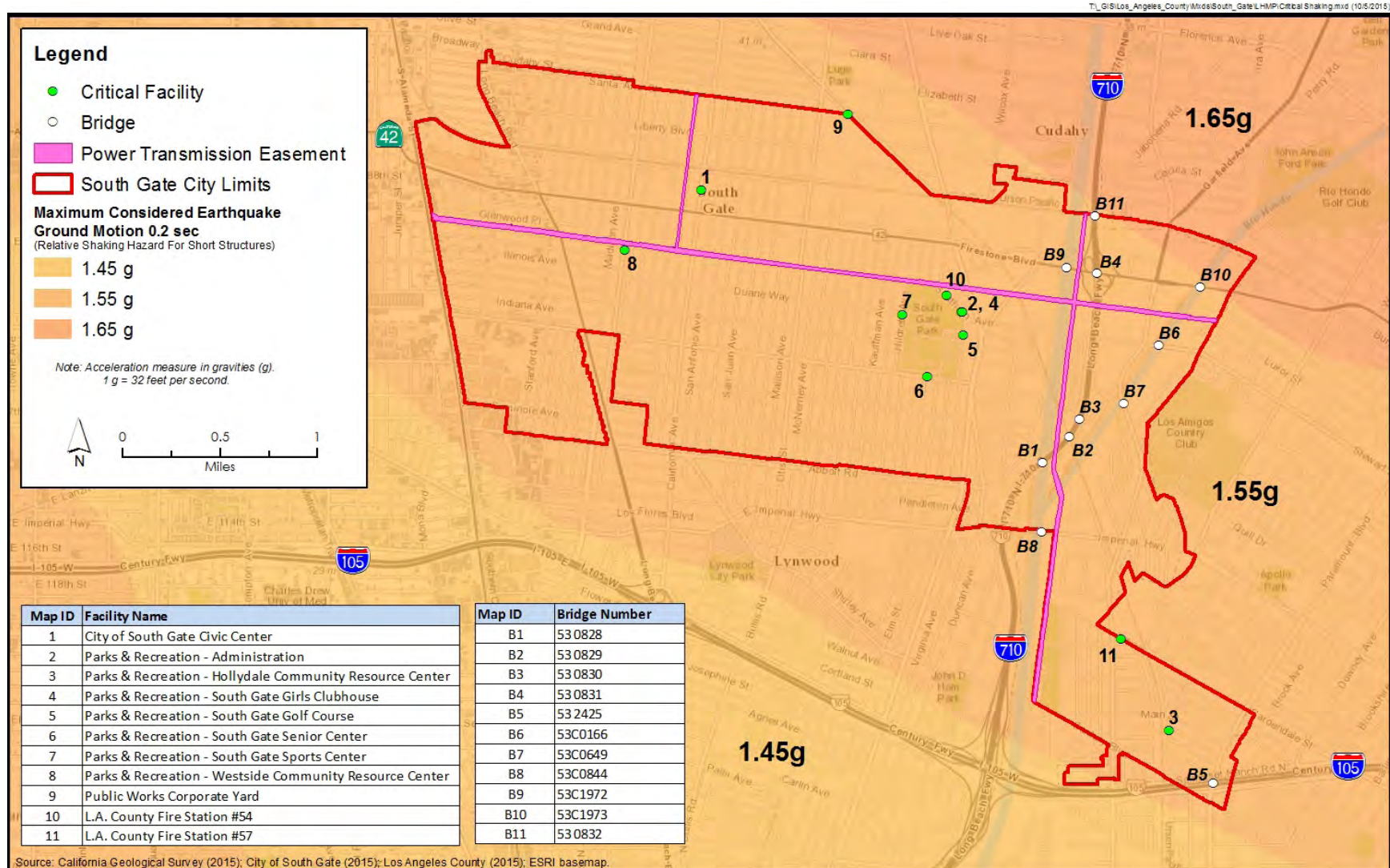
Climate change is not expected to have any direct influence on the likelihood, size, and/or severity of any future seismic-related event. It is possible that anticipated changes to precipitation levels and storm intensity may affect areas subject to liquefaction. However, at this point, the relationship between climate change and liquefaction is too uncertain to include in this document. Since the field of climate change science is dynamic, the City will review and summarize new research that occurs on this topic during the next update cycle.

Figure 6. Proximity to Major Faults



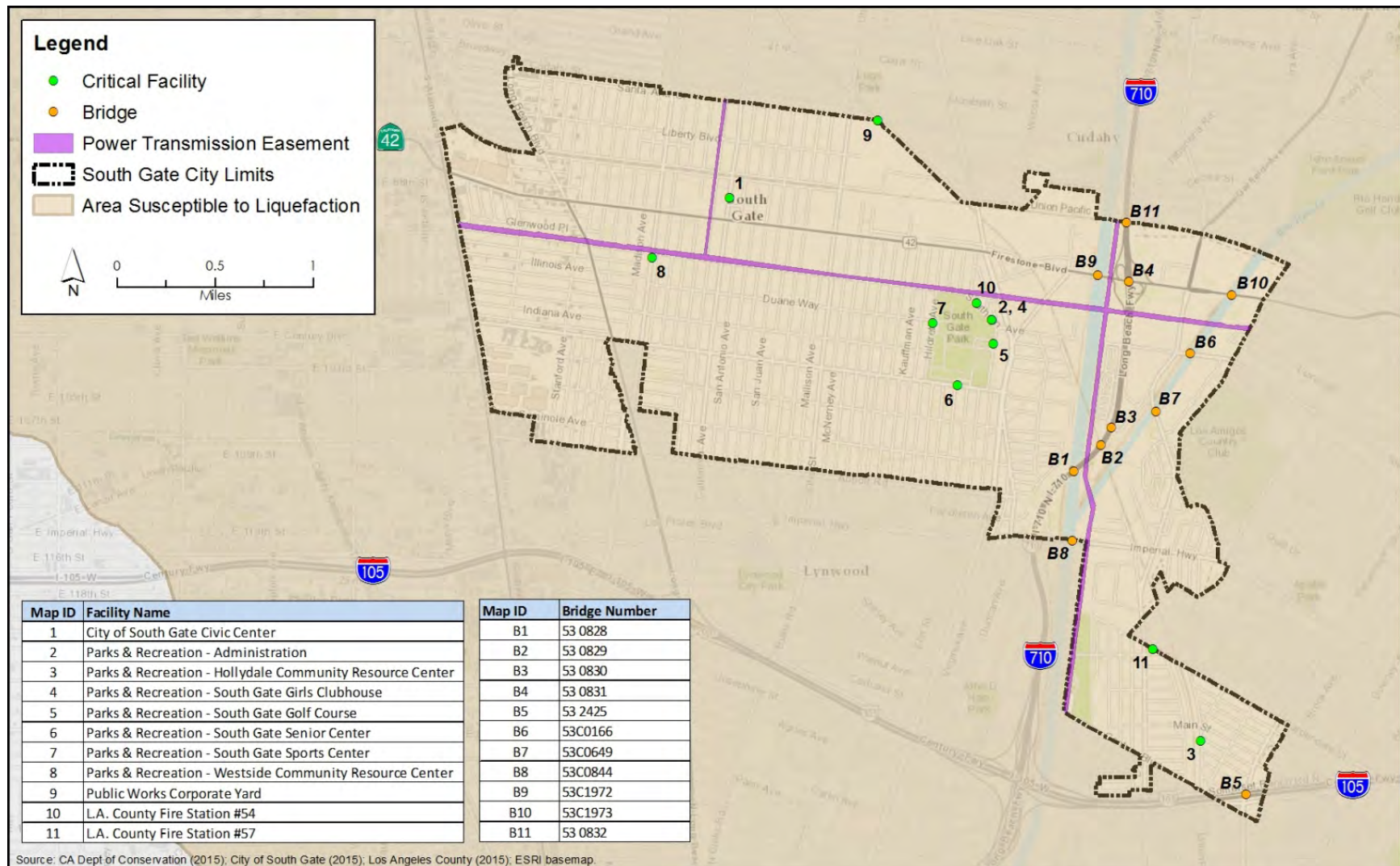
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Figure 7. Potential Ground Shaking



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Figure 8. Area Susceptible to Liquefaction



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Vulnerability/Risk Assessment

Based on Figures 6, 7, and 8, all 11 of the City's critical facilities are susceptible to damage from seismic shaking and liquefaction. Table 17 reports the potential loss that could result from a seismic event. Regarding liquefaction potential, analysis of the liquefaction overlay shows that the populated area affected by liquefaction is a total of 4,706 acres. Approximately 95,000 residents, or 100 percent of the City's total population, could be affected in the event of liquefaction. In addition, 37,816 employees, or 100 percent of the people that work in South Gate, could be affected.

Table 26 at the end of the chapter provides a summary of residents and employees affected by hazard. It should be noted that although the City is located in a state liquefaction zone, based on discussion with South Gate City staff, water tables are deep enough (between 80 and 100 feet) that despite being in a liquefaction zone, liquefaction does not pose a substantial threat.

Table 17. Critical Facilities Susceptible to Seismic Shaking and Liquefaction

Map Number	Facility Name	Replacement Value	Contents Value	Potential Loss
1	City of South Gate Civic Center	\$18,942,341	\$2,399,619	\$21,341,960
2	Parks & Recreation - Administration	\$5,527,027	\$343,609	\$5,870,636
3	Parks & Recreation - Hollydale Community Resource Center	\$1,063,646	\$199,154	\$1,262,800
4	Parks & Recreation - South Gate Girls Clubhouse	\$2,547,566	\$143,044	\$2,690,610
5	Parks & Recreation - South Gate Golf Course	\$135,221	\$19,645	\$154,866
6	Parks & Recreation - South Gate Senior Center	\$1,369,861	\$87,801	\$1,457,662
7	Parks & Recreation - South Gate Sports Center	\$19,078,910	\$597,246	\$19,676,156
8	Parks & Recreation - Westside Community Resource Center	Not available	Not available	Not available
9	Public Works Corporate Yard	\$11,319,189	\$2,383,013	\$13,702,202
10	L.A. County Fire Station #54	Not available	Not available	Not available
11	L.A. County Fire Station #57	Not available	Not available	Not available
Total Potential Losses				\$66,156,892

Extreme Heat

Hazard Description

While there is no universal definition for an extreme heat event, a common definition for planning in California identifies an extreme heat day as a day where the high temperature exceeds the average high temperatures of 98 percent of the historic days between April and October. Five extreme heat days in a row is considered a heat wave. The threat of extreme heat can be higher in urban areas, where dark-colored roofs and paving materials cause the air temperature to be hotter than in surrounding, less developed areas; this is known as the urban heat island effect.

The greatest risk from extreme heat events are health-related. While some heat-related illnesses are often minor and/or temporary, including heat rash, heat cramps, and heat exhaustion, extreme heat can overwhelm the body's ability to maintain a safe internal temperature (an ability called thermoregulation), which can cause a person's body temperature to reach dangerous levels. If a person's internal temperature rises from a normal level of 98.6°F to 104°F or above, heatstroke, the most serious heat-related illness, can occur. Heatstroke can cause fainting, seizures, and mental impairment. If left untreated, it may lead to permanent organ damage, coma, or death.

The risks of extreme heat are higher for some individuals, including the elderly, lower-income individuals, and outdoor workers. Elderly persons, especially those 85 years of age or older, are more likely to suffer potentially fatal respiratory and cardiovascular complications during heat events. They are also more likely to take medication that already reduces their thermoregulatory capability, and may be less likely to take care of themselves during emergency situations. Lower-income individuals are more likely to live in housing without adequate cooling capacity, such as an air conditioner, which can make them more vulnerable to heat-related illnesses. They may also lack access to effective transportation that allows them to reach cooling centers, seek medical help, or obtain other assistance as needed. Outdoor workers, such as construction workers, are more exposed to extreme heat conditions than many other people and therefore are also at risk of extreme heat.

Infrastructure-related complications can also result from extreme heat. Power lines can become stressed during extreme heat, due to a combination of equipment being less efficient in high temperatures and increased demand for electricity during extreme heat (generally to run air conditioners). This combination of factors can overwhelm electricity infrastructure and make it more likely to fail, which can cause power outages and in turn result in increased health risks. In particularly extreme heat events, roads and railways may be damaged by the high temperatures, creating transportation delays or closures.

Hazard History

The worst heat event in California history occurred in the Los Angeles area in 1955, when an eight-day heat wave resulted in temperatures as high as 108°F in downtown Los Angeles and killed 946 people. A heat wave in July 2006 killed 147 people throughout the state, although the Los Angeles region was less impacted than the Central Valley.

According to Cal Adapt (the State of California Climate Adaptation data portal), an extreme heat event in South Gate occurs when temperatures in the area rise above 92°F, which on average occurs four times each year.

Risk of Future Hazards

The risk of extreme heat events is likely to rise in South Gate and throughout California. An increase in extreme heat events is one of the primary threats posed by climate change. Future extreme heat events are likely to be more frequent and more intense, and potentially longer-lasting. The California Energy Commission forecasts that by 2050, South Gate could see up to 31 extreme heat days each year, potentially rising to as high as 77 extreme heat days by the end of the century. In addition to direct health impacts, this may cause street trees and other vegetation in South Gate to suffer further stress, making them more vulnerable to disease or death. This is of particular concern since street trees help provide necessary shade, reducing the urban heat island effect.

Climate Change Considerations

As noted above, climate change is likely to cause an increase in the frequency and severity of extreme heat events throughout California. Although the greatest increases are likely to occur in more inland areas, scientists have identified moderate-temperature areas such as South Gate as being at an elevated risk because people in these areas are not used to extreme heat. There is a wide range of potential frequency and severity of extreme heat events as a result of climate change, but scientific consensus is that extreme heat will pose a greater risk in future years than it currently does due to climate change.

Vulnerability/Risk Assessment

Like other communities in the region, South Gate is at an elevated risk of extreme heat. Urbanized areas experience higher temperatures than rural communities (known as the urban heat island effect⁸), which could further elevate temperatures in and around the City. South Gate has a somewhat greater rate of poverty than Los Angeles County as a whole, and so may have a greater proportion of lower-income residents with elevated vulnerability than surrounding communities.

Hazardous Materials

Hazard Description

The category of “hazardous materials” covers a large range of natural and artificial substances that can be a risk to the public, such as toxic metals and chemicals, flammable or explosive materials, corrosive material, infectious substances, and radioactive materials. These materials can create health problems if inhaled, touched, or ingested. Alternatively, these materials can be relatively harmless by themselves but can create dangerous conditions (e.g., explosives).

⁸ According to the US EPA, the urban heat island effect is a measurable increase in ambient urban air temperatures resulting primarily from the replacement of vegetation with buildings, roads, and other heat-absorbing infrastructure. The heat island effect can result in significant temperature differences between rural and urban areas.

Hazardous materials can also escape from containment vessels and contaminate groundwater, soil, or air, which may result in further impacts. There is also concern about the long-term public health and environmental impacts that may result from the sustained use of or exposure to such materials.

Hazardous material emergencies can occur in a number of ways. An unrelated disaster such as an earthquake or flood may damage storage tanks or pipes, causing the material to leak out. Even if buildings or containment structures suffer minimal damage, hazardous materials can be released. Accidents can also occur independently of other disasters, such as from human error or malfunctioning or broken equipment.

Transportation accidents are another way that hazardous materials may pose a risk to people and property. Road vehicles, trains, and (more rarely) aircraft are all used to transport these materials, and accidents involving these vehicles may involve the release of hazardous materials. One of the most prominent examples of a transportation accident involving hazardous materials occurred in 1973 in the City of Roseville, near Sacramento. A freight train entering the City's rail yard suffered a brake accident, setting a wooden boxcar carrying 250-pound bombs on fire. The resulting explosion destroyed the rail yard and injured approximately 100 people, although there were no fatalities.

Hazard History

There is no history of significant hazardous material-related emergency events in South Gate, although there have been a few substantial events in the vicinity. The 1994 Northridge earthquake led to over 15,000 natural gas leaks and 60 hazardous material releases that required an off-site response. More recently, an overpressurized piece of equipment at an oil refinery in Torrance caused an explosion that released particles of fiberglass and glass wool into the surrounding neighborhoods.

Risk of Future Hazards

In South Gate, a prime area of concern for hazardous material releases is via rail accidents. There are two rail lines in South Gate, both owned by the Union Pacific Railroad. The Spur Line runs along the northern portion of the City in an east–west direction north of Firestone Boulevard, while the San Pedro Subdivision runs diagonally through the eastern portion of South Gate in a generally north–south alignment. According to South Gate's 2009 General Plan, both lines handle approximately four to six trains each day. There are no grade-separated rail crossings in South Gate, except for where the San Pedro Subdivision runs underneath Interstate 710. A third freight rail line, called the Alameda Corridor, runs along Alameda Avenue at the City's western border and connects the Ports of Los Angeles and Long Beach to the national rail network near downtown Los Angeles. In 2015, the Alameda Corridor carried an average of 41 trains each day. Trains carrying hazardous materials may use any of these three rail lines, and an accident involving hazardous materials on any of these rail lines may create a health and safety risk in South Gate.

South Gate may also be at risk from sites previously contaminated with hazardous or potentially hazardous materials. The California Department of Toxic Substances Control maintains a list of stationary hazardous material facilities with known or potential soil contamination. This list, called the Cortese List, identifies four such sites in South Gate. All four

were previously used for various industrial activities, including manufacturing, machine repair, and recycling. These four sites are currently undergoing cleanup activities. Table 18 identifies these sites and the potential sources of contaminants.

Table 18. Cortese List Sites in South Gate

Address	Oversight Agency	Potential Contaminants
5211 Southern Avenue	US Environmental Protection Agency	Metals (cadmium, copper, lead, nickel, chromium, and/or zinc) Volatile organic compounds (VOCs)
2525 East Firestone Boulevard	California Department of Toxic Substances Control	Dry-cleaning fluid Industrial solvents
9301 Rayo Avenue	US Environmental Protection Agency	Industrial solvents
8440 Alameda Street	California Department of Toxic Substances Control	Metals (cadmium, copper, lead, nickel, chromium, and/or zinc) Gasoline and/or diesel Volatile organic compounds (VOCs)

Source: California Department of Toxic Substances Control, http://www.dtsc.ca.gov/SiteCleanup/Cortese_List.cfm

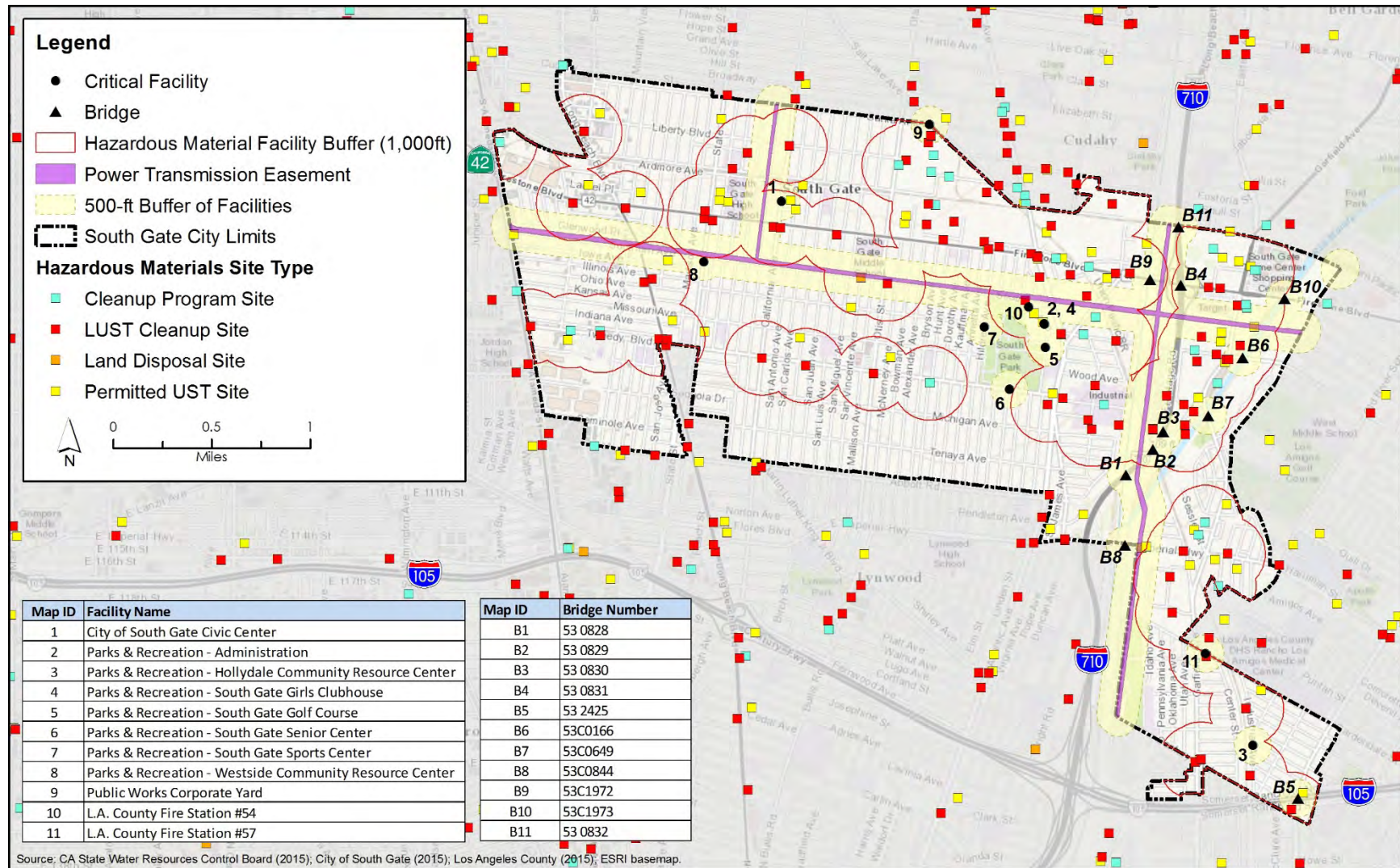
In addition to the facilities on the Cortese List, the State Water Resources Control Board maintains a record of all sites in California that are regulated to help prevent contamination to water bodies and groundwater supplies. There are 155 such sites in South Gate, most of which are underground storage tanks. However, many of these sites are closed and all cleanup activities have been completed. Table 19 shows the number of sites in South Gate by status. While some risk does remain, only a handful of sites are in a position that could result in hazardous materials release. Figure 9 illustrates all hazardous material sites in the City.

Table 19.Regulated Groundwater Contaminant Sites in South Gate by Status

Status	Number of Sites	Description
Active – WDR	2	The site is currently active and regulated under the Waste Discharge Requirements program.
Completed – Case Closed	110	A formal closure decision document has been issued.
Historical – WDR	4	The site was previously regulated under the Waste Discharge Requirements program but no longer is.
Never Active – WDR	2	The site is regulated under the Waste Discharge Requirements program, but has never been active.
Open – Assessment and Interim Remedial Action	2	Interim remediation is ongoing, and other investigative or analytical actions are occurring.
Open – Eligible for Closure	5	All corrective action is done.
Open – Inactive	7	There are no regulated activities at the site.
Open – Remediation	7	A remediation strategy has been selected and is being implemented.
Open – Reopen Case	1	The site has been reopened for further analysis or remediation.
Open – Site Assessment	14	The site is being analyzed.
Open – Verification Monitoring	1	Remediation is complete, and a monitoring program is in place to confirm the successful conclusion of these activities.
Total	155	

Source: California State Water Resources Control Board, <https://geotracker.waterboards.ca.gov/>

Figure 9. Hazardous Material Locations



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Climate Change Considerations

While climate change is not directly linked to the risk of hazardous material releases, it does pose an indirect risk. Climate change is expected to increase the number of intense storm events in and around South Gate, which may result in an increase in flooding and severe wind. Both types of events could damage hazardous material storage containers, increasing the risk of potential release.

Vulnerability/Risk Assessment

Table 20 identifies critical facility locations that could be exposed to hazardous materials releases during a disaster event. These locations only take into consideration the proximity to existing hazardous materials facilities and do not include potential exposure associated with the movement/transport of hazardous materials. The maximum potential loss shown in the table is based on the assumption that all facilities within 500 feet of a hazardous materials facility would be impacted during a hazardous materials release/event. While this is possible, actual losses will vary based on the location and magnitude of the event.

Table 20. South Gate Critical Facilities Located Adjacent to Hazardous Materials Sites

Map #	Facility	Replacement Value	Contents Value	Potential Loss
1	City of South Gate Civic Center	\$18,942,341	\$2,399,619	\$21,341,960
2	Parks & Recreation - Administration	\$5,527,027	\$343,609	\$5,870,636
4	Parks & Recreation - South Gate Girls Clubhouse	\$2,547,566	\$143,044	\$2,690,610
9	Public Works Corporate Yard	\$11,319,189	\$2,383,013	\$13,702,202
10	L.A. County Fire Station #54	Not available	Not available	Not available
11	L.A. County Fire Station #57	Not available	Not available	Not available
Total Potential Losses		\$38,336,123	\$5,269,285	\$43,605,408

Analysis of the hazardous materials overlay shows that the populated area within 1,000 feet of a hazardous materials facility is a total of 2,868 acres. A total of 48,288 residents (51 percent of the City's total population) could be exposed to a hazardous materials release. In addition, 19,026 employees, or about 50 percent of the people that work in South Gate, could be exposed. Table 26 at the end of the chapter provides a summary of residents and employees affected by hazard.

Severe Weather

Hazard Description

Severe weather, as defined in this Plan, includes hail, tornadoes, and wind/windstorms. Other weather and climate-related hazards, including flooding, drought, and extreme heat, are discussed in their respective sections.

Hail is a type of precipitation that involves rough spheres or lumps of ice. It forms within strong thunderstorms, when water droplets are forced upward in the thundercloud by strong winds called updrafts. As the droplets rise, the air temperature drops below freezing, causing the drops to freeze and stick together. Eventually the weight of the hailstone becomes too heavy for the updraft to hold it up, and it falls to the surface.⁹ Hailstones are generally larger than 0.2 inches across, and can pose a hazard when they grow larger than 0.8 inches. At this size, they can damage roofs, break windows, and damage plant leaves. Particularly large hailstones can knock branches off of trees, causing further damage. In very rare instances, people struck by massive hailstones can suffer concussions or other head trauma.

Tornadoes are rotating columns of air reaching from the ground's surface to a cloud, usually a thundercloud. Although scientists do not fully understand how tornadoes form, tornadoes typically start when rapidly descending wind within a thunderstorm (a downdraft) drags a rotating part of the thunderstorm called the mesocycle down below the base of the cloud and focuses the mesocycle's base over a relatively small area. At the same time, the mesocycle causes air currents of different temperature and humidity to mix, which creates an area of low pressure directly below the mesocycle. This low-pressure area pulls the focused mesocycle to the ground, where it becomes a tornado. The threat caused by tornadoes is due to very high wind speeds, which can directly damage objects and structures. Additionally, tornadoes can pick up heavy objects and smash them into other objects or buildings, causing further damage. The strength of a tornado is measured using the Enhanced Fujita scale, which estimates wind speeds by the observed damage. The Enhanced Fujita scale is shown in Table 21.

Table 21. Enhanced Fujita Scale

Rating	Wind Speeds ¹	Description
F0	65 to 85 mph	Light damage: Some damage to chimneys. Branches broken off trees. Shallow-rooted trees pushed over. Sign boards damaged.
F1	86 to 110 mph	Moderate damage: Surfaces peeled off roofs. Mobile homes pushed off foundations or overturned. Moving vehicles blown off roads.
F2	111 to 135 mph	Considerable damage: Roofs torn off frame houses. Mobile homes demolished. Box cars overturned. Large trees snapped or uprooted. Light objects become missiles. Cars lifted off ground.
F3	136 to 165 mph	Severe damage: Roofs and some walls torn off well-constructed buildings. Trains overturned. Most trees uprooted. Heavy cars lifted off the ground and thrown.
F4	166 to 200 mph	Devastating damage: Well-constructed buildings leveled. Structures with weak foundations blown away. Large objects become missiles.
F5	More than 200 mph	Incredible damage: Strong frame buildings leveled and swept away. Automobile-sized missiles fly through the air in excess of 100 meters. Incredible phenomena will occur.
1. These are the estimated wind speeds of a three-second gust, based on the type of damage. The wind speeds are not observed measurements. Source: NOAA Storm Prediction Center, http://www.spc.noaa.gov/efscale/		

⁹ Hail is sometimes confused with sleet, which is made of much smaller balls or pellets of ice. While hail is formed in thunderstorms, sleet is created when snow melts and then refreezes, and thus only occurs in very cold weather.

Independent of tornadoes, very high winds can also pose a threat by directly damaging property or by causing indirect damage such as spreading or intensifying a fire, creating airborne debris and missiles, or blowing over trees. Severe winds may occur in a storm system, where the differences in air pressure, temperature, and humidity can create strong gusts, or they may occur independently. The intensity of wind events is measured in the Beaufort scale, shown in Table 22.

Table 22. Beaufort Scale

Beaufort Scale	Wind speed	Description
0: Calm	Less than 1 mph	Smoke rises vertically.
1: Light air	1 to 3 mph	Direction shown by smoke drift but not by wind vanes.
2: Light breeze	4 to 7 mph	Wind felt on face; leaves rustle; wind vane moved by wind.
3: Gentle breeze	8 to 12 mph	Leaves and small twigs in constant motion; light flags extended.
4: Moderate breeze	13 to 18 mph	Raises dust and loose paper; small branches moved.
5: Fresh breeze	19 to 24 mph	Small trees in leaf begin to sway; crested wavelets form on inland waters.
6: Strong breeze	25 to 31 mph	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty.
7: Near gale	32 to 38 mph	Whole trees in motion; inconvenience felt when walking against the wind.
8: Gale	39 to 46 mph	Twigs break off trees; generally impedes progress.
9: Strong gale	47 to 54 mph	Slight structural damage (chimney pots and slates removed).
10: Storm	55 to 63 mph	Seldom experienced inland; trees uprooted; considerable structural damage.
11: Violent storm	64 to 72 mph	Very rarely experienced; accompanied by widespread damage.
12: Hurricane	73 mph and above	Devastation.

Source: Royal Meteorological Society, <http://www.rmets.org/weather-and-climate/observing/beaufort-scale>

Hazard History

Hail is a relatively uncommon event in the Los Angeles region, and any such events that do occur are usually fairly harmless. However, a few rare significant hail events in the area have created a hazard for people and property. In 1986, a series of thunderstorms created hail that caused traffic accidents in Pasadena and caused classes to be cancelled at California State University, Northridge. Hail events are somewhat more common in the desert areas of Southern California, which are more likely to see thunderstorms than the coastal regions. In 1960, hail 2.75 inches in diameter fell in Riverside County, the largest size hail to hit Southern California. More recently, a 2008 hailstorm in the San Jacinto Mountains injured two people (the only known event in California of people being injured by hail) and forced a helicopter to make an emergency landing. South Gate staff also reported localized hail events causing damage to property in the City within the last 10 years.

Tornadoes are most common in the Great Plains and Midwest regions of the United States, between the Rocky and Appalachian Mountain ranges. However, tornado events can occur in all parts of the United States, including California. The California Multi-Hazard Mitigation Plan identifies 316 tornadoes that have struck the state from 1950 to 2006, most of which measured F0 on the Enhanced Fujita scale. The state has seen two F3 tornadoes in recorded history: one in Riverside County in 1973, and one in Orange County in 1978 that injured three people. The Tornado Project identifies 42 tornadoes that have struck Los Angeles County since 1950, including an F2 tornado in 1983 that injured 30 people and damaged 50 homes near western Los Angeles. South Gate staff reported the presence of one tornado south of the City near the Los Angeles River channel within the last 20 years.

High winds are an occasional event in the Los Angeles region. A common type of high wind event involves Santa Ana winds, which occur when areas of high pressure form in the Great Basin and northern Mojave Desert regions, both of which sit at high elevation. The pressure forces the air out of these regions toward the California coast, causing it to heat up and dry out as it descends toward sea level. Santa Ana winds can have gusts of 70 to 80 mph or more, and often are responsible for spreading wildfires. Santa Ana events have also toppled trees and knocked out power multiple times in the region in recent years; for example, a 2011 event destroyed multiple buildings and left over 340,000 people without power. Strong wind events can also be associated with thunderstorms. A strong thunderstorm in 2000 caused winds up to 100 mph in the Gateway Cities and southern San Gabriel Valley regions, including causing severe damage to factories and mobile homes in Paramount.

Risk of Future Hazards

South Gate is likely to be at continued risk from these types of events. High winds, including Santa Ana events, are expected to continue to be the primary type of severe weather in the City. Given the severity of these events and the frequency at which they occur, most damage associated with severe weather is likely to be the result of high winds. Hailstorms are expected to remain a more uncommon event, and ones capable of causing substantial damage are likely to be more uncommon still. Tornadoes capable of causing significant damage are rare in California and the odds of one posing a threat to South Gate are low, albeit present.

Climate Change Considerations

Climate change is expected to cause an increase in the number of intense storms that affect California. As hail, tornadoes, and some types of high wind events are all linked to strong thunderstorms, it is possible that an increase in the number of intense storms may also cause an increase in the number of these severe weather events. Scientists have not yet identified any clear relationship between climate change and the frequency or intensity of Santa Ana events, although research into this subject remains ongoing.

Vulnerability/Risk Assessment

The entire City and all critical facilities are susceptible to storm damage. A majority of windstorm damage that occurs is associated with fallen trees/tree limbs. Facilities located in close proximity to large trees may be more susceptible to windstorm damage as a result.

Flood

Hazard Description

Flood events occur whenever water covers what is normally considered dry land. They often occur during heavy precipitation events, when the amount of rainwater exceeds storm drains or flood control channel capacity. Flood event severity depends on the local topography and the ability of the soil in the area to absorb water. Floods can also happen when infrastructure such as levees, dams, or culverts fail. These failures can be linked to precipitation events (e.g., when water erodes a levee, allowing water to escape and flood nearby areas) or be a consequence of other emergency situations (e.g., a dam collapsing due to an earthquake).

The force of a flood is sufficient to carry away large objects and smash them into structures, causing considerable damage to buildings and infrastructure. In severe instances, floodwaters themselves can destroy structures or move them off their foundation. Floods can saturate and weaken soil, potentially making structures built on them more susceptible to damage or collapse. Floods are among the most common types of disaster in California according to the state Multi-Hazard Mitigation Plan, second only to fires. From 1950 to 2012, floods have killed 292 people, more than any other type of disaster. The state has suffered approximately \$4.8 billion in costs due to flooding events.

Hazard History

In the 1800s and early 1900s, South Gate and other communities along the Los Angeles River were subject to frequent and often significant flooding. A major flood in 1914 resulted in the first widespread flood control efforts along the Los Angeles River, which accelerated after a 1938 flood that killed approximately 115 people. The Los Angeles River and other waterways in the area have been largely channelized, which helps to control the rivers but does not remove the risk of flood events. From 1950 to 2012, Los Angeles County had 32 state- and federally declared flood disasters, the second highest of any county in the state. As of 2000, approximately 390,000 people in Los Angeles County lived in areas at elevated risk of flooding.

Risk of Future Hazards

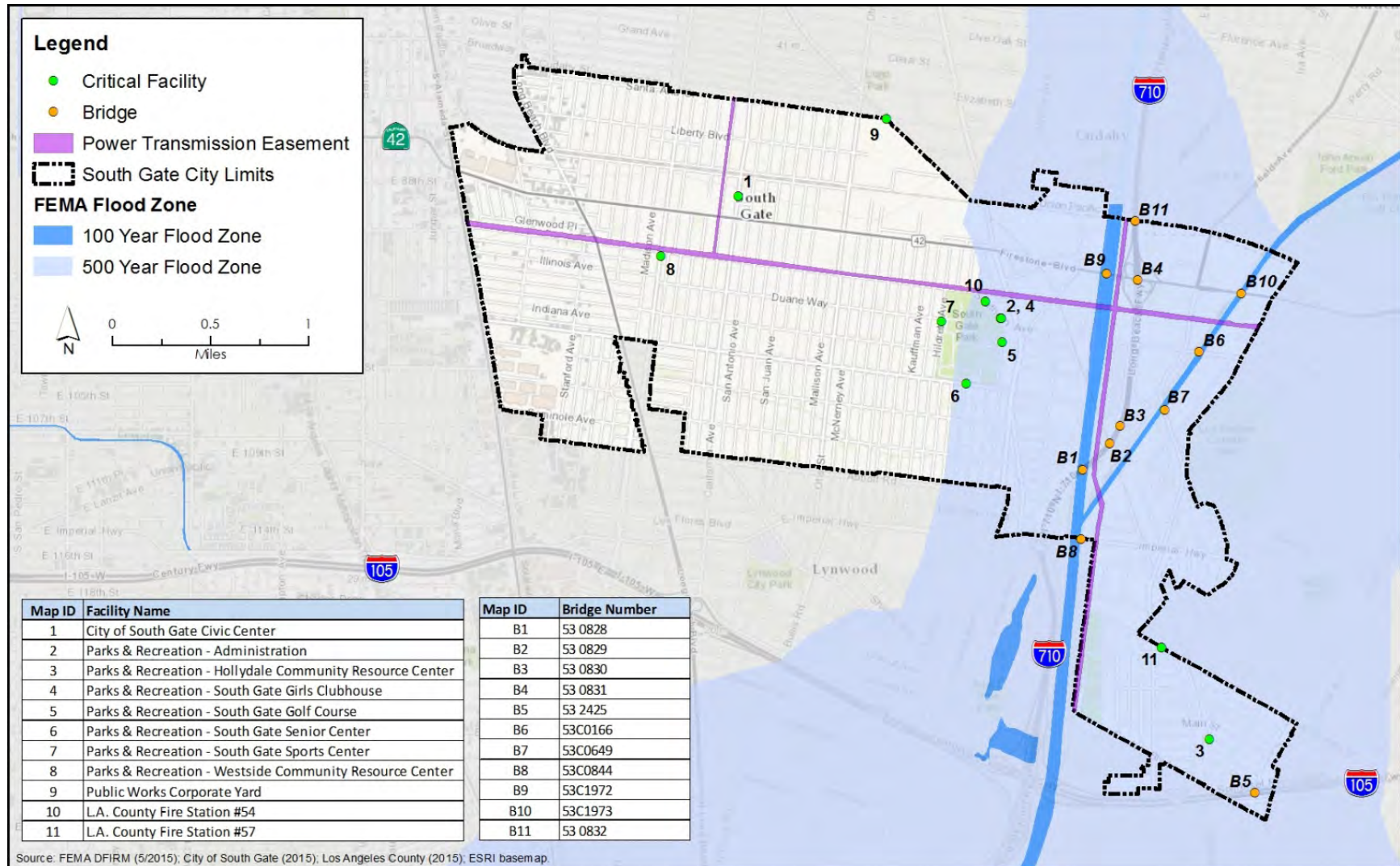
South Gate generally receives an average of 14.5 inches of rainfall a year, although this amount can vary widely from year to year. Like most of California, much of South Gate's rainfall occurs during winter, late autumn, and early spring. On average, the City receives 13.5 inches of rain between November and April, and only about an inch of rain the other half of the year.

Periods of intense rain can happen occasionally in California, usually as a result of a meteorological phenomenon called an “atmospheric river,” which is a narrow band of very moist air that can deliver a strong winter storm. The atmospheric river was likely the cause of the Great Flood of 1862, which caused 35 inches of rain to fall in Los Angeles for four weeks, turned large portions of modern Los Angeles and Orange Counties into shallow lakes, and destroyed an estimated 25 percent of all taxable real estate in California. Scientists have forecasted that a repeat of such an event, known as the ARkStorm scenario, could cause \$400 billion in damage and another \$325 billion in lost economic productivity.¹⁰ Strong storms are also linked to El Niño events, which occur when the surface of the eastern tropical Pacific is warmer than normal and result in various climate extremes around the globe, often including increased precipitation in California.

FEMA flood maps indicate that the eastern portion of South Gate near the Los Angeles River and the Rio Honda drainage channel are at an elevated risk of flooding. The parts of the City east of Jackson Avenue and Burke Avenue are within the 500-year floodplain, meaning that there is a 0.2 percent chance (one in 500) that the area will be subjected to flooding in any given year. The only parts of South Gate within the 100-year floodplain are the Los Angeles River and the Rio Honda drainage channel itself, although land in northeastern Lynwood (immediately south of South Gate) is in the 100-year floodplain. Figure 10 identifies flood zones in the City.

¹⁰ <http://pubs.usgs.gov/of/2010/1312/>

Figure 10. South Gate Flood Zones



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Climate Change Considerations

Climate change is expected to cause an overall decrease in precipitation levels and a general increase in drought conditions throughout much of California. However, evidence suggests climate change may also result in an increase in the number of more intense storms. These two changes may contribute to an increased flooding risk. More intensive storms are likely to drop a larger amount of water in a shorter period of time, increasing the risk of the volume of water overwhelming the ability of the soil or infrastructure to drain it away, and thus creating flooding. The overall drier conditions are expected to dry out the soil, which makes it more difficult for water to soak into the ground, further increasing the risk of flooding. It is not yet known if climate change will affect the frequency or severity of El Niño events.

Vulnerability/Risk Assessment

As discussed above and as shown in Figure 10, nearly half of the City is located within the 500-year flood zone, with very small portions, mostly river channels, located in the 100-year flood zone. Seven critical facilities are located in the FEMA 500-year flood plains; no facilities are located within a 100-year flood plain.

Analysis of the flood zone overlays shows that the populated area within 500 feet of a 100-year flood zone is a total of 502 acres. A total of 944 residents (1 percent of the City's total population) would be affected by a 100-year flood not related to dam failure inundation. In addition, 352 employees, or 1 percent of the people that work in South Gate, could be affected. Table 26 at the end of the chapter provides a summary of residents and employees affected by hazard.

Disease/Pest Management

Hazard Description

Disease and pest management hazards are caused by an undesirable organism (insects, bacteria, viruses, etc.) that causes serious harm to plants, animals, or humans. These organisms can threaten human health by infecting people with a number of diseases, some of which are potentially fatal. Pathogenic or disease-carrying organisms may also cause widespread devastation to forests, creating safety hazards and causing environmental damage in addition to economic impacts.

One disease of concern is West Nile virus. Birds are often a host for the virus, which can be spread when a mosquito bites an infected bird and then later bites a person. As a result, many agencies will test the blood of wild or domestic birds to look for the presence of West Nile virus. Approximately 80 percent of people infected with West Nile virus will not show any symptoms, while 20 percent of people will experience fever, nausea, headache, or other symptoms resembling the common cold or a mild case of influenza. In less than 1 percent of infected people, the virus attacks the central nervous system, potentially causing meningitis or encephalitis.

For many urban areas, diseases and pests that impact street trees are a concern, as most types of street trees are susceptible to diseases. Insects called aphids are among the most common pest, sucking sap from the tissue of trees and other plants. This can weaken the tree by depriving it of nutrients, and may also introduce other pathogens such

as fungi or viruses. Another type of insect, the bark beetle, burrows into the inner bark of trees, weakening and often killing them. At times, massive outbreaks of bark beetles can kill vast swaths of forests. A fungal disease called sudden oak death has devastated a large number of oak trees in California and Oregon. Since it was first observed in 1995, it is estimated to have killed over 100 million trees, primarily in the coastal areas of Central and Northern California.

Hazard History

Since the predominant strains of influenza and their virulence change each year, the number of influenza cases also changes significantly each year. In the most recent flu pandemic of 2009–2010, confirmed cases of influenza killed 135 people in Los Angeles County and sent another 247 people to intensive care units. By contrast, in the following 2010–2011 flu season, 10 people died and another 3 required intensive care. In the 2013–2014 flu season, Los Angeles County saw 83 deaths and another 27 intensive care patients. Specific numbers for South Gate are not available.

The number of West Nile virus cases also varies substantially from year to year. The virus first appeared in California in 2003, and had been observed in all counties in the state by 2004. As of the end of 2014, California had reported 4,805 cases of West Nile virus, with 176 fatalities. In 2014, Los Angeles County saw 253 human cases of the disease, although the number of cases in South Gate is unavailable. As of July 2015, one swimming pool in South Gate has tested positive for mosquitoes infected with West Nile virus.

In South Gate, the predominant type of street tree is sycamore, which is vulnerable to various diseases and pests. A fungal disease called anthracnose or sycamore blight can affect California sycamores, as well as a number of other trees. Although it generally does not kill the tree or cause permanent damage on its own, it does cause the trees to shed leaves, which can weaken the tree and make it more susceptible to other diseases or pests. The disease has infected trees throughout the Los Angeles area, and appears to be more common in years with a wet late winter or spring.

Risk of Future Hazards

A number of preventative actions can reduce the risk of diseases such as influenza and West Nile virus. Vaccination and basic hygiene can significantly decrease the odds of a person catching influenza. Similarly, individuals can reduce the risk of mosquito bites (and by extension, the risk of West Nile virus), by draining pools of stagnant water, using screens and protective clothing, and wearing insect repellent. However, eradicating these diseases is extremely unlikely in the short term. It is likely that they will continue to affect South Gate and surrounding communities. While various health organizations and scientific outlets have spoken about the risk of pandemics, it is difficult to say to what extent South Gate specifically may be at risk from any future pandemic events.

It is also likely that anthracnose will continue to infect trees in South Gate. While fungicides are available to control the spread of the disease, they can be very toxic and may not be the best choice in all instances. While the City and property owners may not be able to eradicate anthracnose and other tree diseases or pests, basic preventative measures such as inspections, quarantines, and monitoring, in coordination with the Los Angeles County Agricultural Commissioner's office, can help to minimize their impact.

Climate Change Considerations

There is no firmly established link between climate change and influenza. However, as the influenza virus changes rapidly, it is possible that changes in animal migration patterns or other factors brought on by climate change may create additional opportunities for the virus to mutate, potentially into more virulent forms. Climate change is expected to cause a rise in West Nile virus, as warmer temperatures mean that mosquitoes are likely to remain more active for a longer period of the year, increasing the opportunities for infected mosquitoes to bite people.

The changes in temperature and precipitation brought on by climate change may make conditions more favorable for certain pests or pathogens. For example, decreases in precipitation linked to climate change are making pine trees drought-stressed throughout wide areas of the western United States, increasing their vulnerability to pests such as the bark beetle. It is possible that trees in South Gate and the wider Los Angeles area may become more susceptible to diseases or pest infestations as a result.

Vulnerability/Risk Analysis

The entire City of South Gate is vulnerable to influenza, the West Nile virus, and certain tree diseases. South Gate does not have any unique conditions that make the community more or less vulnerable to the impacts of these diseases.

Dam Failure

Hazard Description

Dam failure occurs when a dam is damaged, partially or completely compromising its ability to hold back water. This can occur as a result of earthquakes or other seismic activity, erosion of the dam face or foundation, or rapidly rising floodwaters that weaken the dam or overwhelm its capacity to drain excess water, or if the rock or ground the dam is built on is flawed. Dam failure can also occur as a result of human error, such as construction or design flaws that were not properly addressed. Dam failure results in sudden, fast-moving floods that can damage or destroy property, cause injury or loss of life, and displace large numbers of people in the flood's path. A dam failure event can also damage regional infrastructure such as transportation and energy networks, causing impacts outside of the immediate inundation zone.

The US Army Corps of Engineers has developed a five-degree rating system for dam safety, called the Dam Safety Action Classification (DSAC) system, shown in Table 23.

Table 23. Dam Safety Action Classification System

DSAC Rating	Description
DSAC-I	Very High Urgency: Progression toward failure is confirmed to be taking place under normal operations, and the dam is almost certain to fail under normal operations without intervention within a few years, potentially immediately. Alternatively, the life or economic consequences given the probability of failure is extremely high.
DSAC-II	High Urgency: Failure could begin under normal operations or as the result of an event, and the likelihood of failure before intervention is too high to assure public safety. Alternatively, the life or economic consequences given the probability of failure is very high.
DSAC-III	Moderate Urgency: The dam has issues indicating that it is significantly inadequate. Alternatively, the life or economic consequences given the probability of failure is moderate to high.
DSAC-IV	Low Urgency: The dam has issues indicating that it is inadequate and it may not meet all essential engineering guidelines. However, the life, economic, and/or environmental consequences given the probability of failure is low.
DSAC-V	Normal: The dam is considered adequately safe and meets all essential guidelines. The risk is considered tolerable.
Source: US Army Corps of Engineers, http://www.usace.army.mil/Missions/CivilWorks/DamSafetyProgram/ProgramActivities.aspx	

Hazard History

Dam failure events are very rare, as dams that are large enough to hold back massive quantities of water are designed to very high safety standards. During floods, dam operators will often release more water than normal from the dam, reducing the risk of incoming water exceeding the dam's capacity. Nevertheless, the Los Angeles region has experienced dam failures before. In 1928, the St. Francis Dam, constructed approximately 45 miles northwest of South Gate as part of the Los Angeles Aqueduct system, failed catastrophically due to weak foundations and a leak which had eroded part of the dam structure; modern analysis suggests a landslide may also have been involved. The collapse caused a wave of water as high as 140 feet, which steadily decreased as it rushed 54 miles to the ocean over a period of 5.5 hours. The disaster killed an estimated 431 people (although some estimates are over 600), damaged several towns, and knocked out power to parts of the San Fernando Valley and downtown Los Angeles. In 1963, the Baldwin Hills Dam approximately 10 miles northwest of South Gate experienced a partial collapse due to geologic conditions. The resulting flood killed 5 people and destroyed 277 homes.

Risk of Future Hazards

All of South Gate is within the potential dam inundation zone for at least one dam. Hansen Dam, which was built in 1940 as a flood control measure in response to the Los Angeles River floods of 1938, threatens the largest portion of the City; all of South Gate except for the extreme northeastern corner near the South Gate Town Center shopping center is within the Hansen Dam inundation zone. Hansen Dam is located approximately 23 miles northwest of South Gate, in the San Fernando Valley. The US Army Corps of Engineers gives Hansen Dam a DSAC-III rating. Due to this rating, the dam's

Emergency Action and Notification Plan is updated annually, and special inspections are triggered if the water level reaches a certain height. Hansen Dam's DSAC rating and breadth of inundation zone make it the primary dam failure hazard in South Gate.

The part of South Gate near the Los Angeles River and Rio Honda drainage channel is within the inundation zone for the Whittier Narrows Dam, located on the San Gabriel River approximately 7 miles northeast of South Gate in the City of Montebello. The gates of Whittier Narrows Dam are normally left open and so there is no reservoir behind the dam that could cause an emergency if the dam fails; the dam's gates are only closed and a reservoir allowed to build during flood events. The dam is rated DSAC-II.

A third dam, Garvey Dam, threatens a relatively small part of northeastern South Gate. It is located 8 miles northeast of South Gate in Monterey Park, and is operated by MWD. While current safety information is not available, earthquakes caused cracks to appear in the reservoir, which resulted in flooding several nearby homes in 1989. Figure 11 illustrates South Gate's dam failure inundation zones.

Climate Change Considerations

Climate change is expected to cause more frequent periods of intense precipitation, leading to a potential rise in flood events. It is possible that floodwaters may damage dams or erode the ground that they are built on, increasing the risk of dam failure.

Vulnerability/Risk Assessment

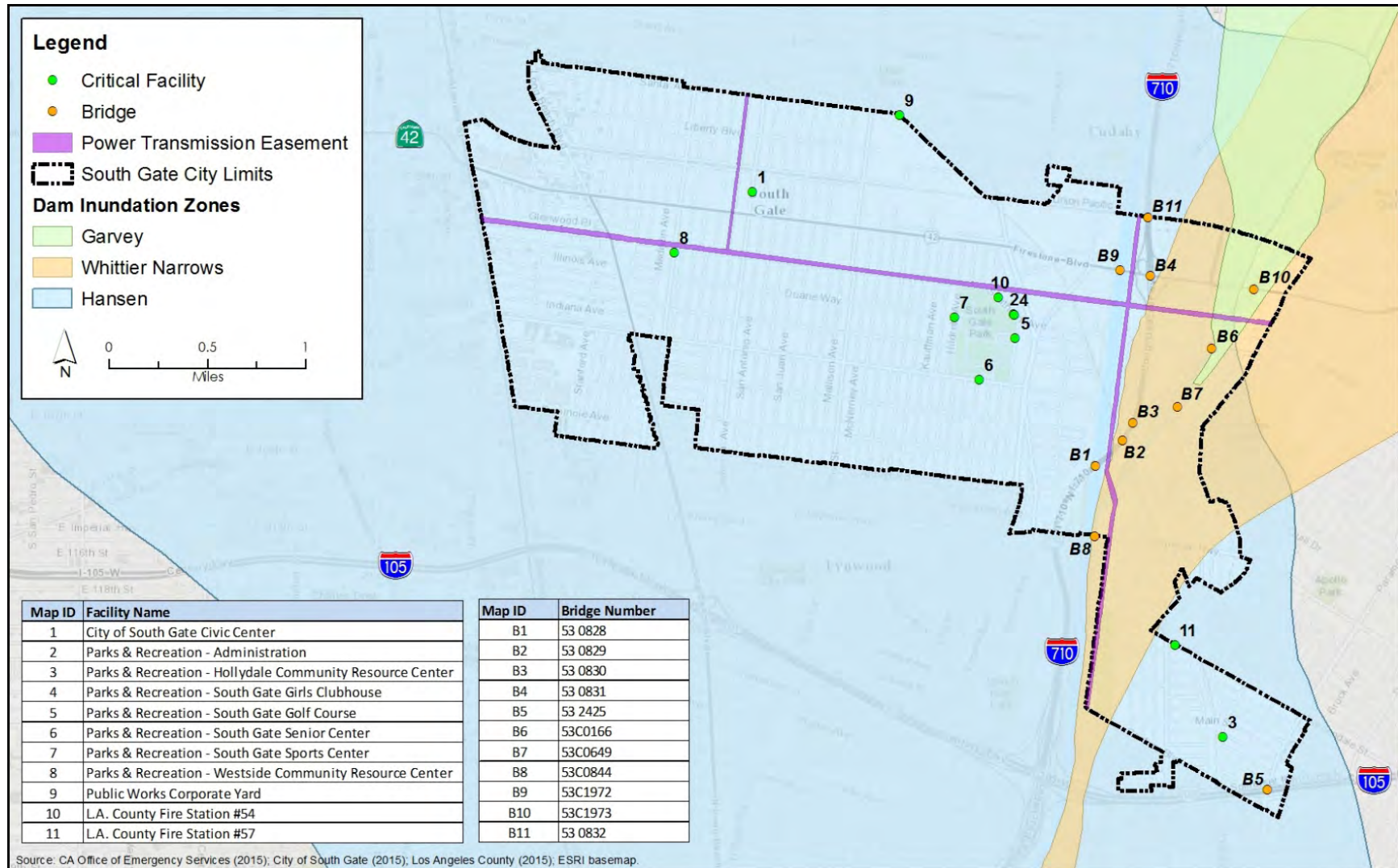
As noted in Table 24, all critical facilities in the City could be inundated as a result of dam failure. The total potential loss shown in the table is based on the assumption that structures are completely destroyed. It should be noted that this assumption is the best available, and intended to be a conservative estimate. However, complete facility destruction is unlikely given the City's proximity to the dams.

Table 24. South Gate Critical Facilities at Risk of Inundation from Dam Failure

Map Number	Facility Name	Replacement Value	Contents Value	Potential Loss
1	City of South Gate Civic Center	\$18,942,341	\$2,399,619	\$21,341,960
2	Parks & Recreation - Administration	\$5,527,027	\$343,609	\$5,870,636
3	Parks & Recreation - Hollydale Community Resource Center	\$1,063,646	\$199,154	\$1,262,800
4	Parks & Recreation - South Gate Girls Clubhouse	\$2,547,566	\$143,044	\$2,690,610
5	Parks & Recreation - South Gate Golf Course	\$135,221	\$19,645	\$154,866
6	Parks & Recreation - South Gate Senior Center	\$1,369,861	\$87,801	\$1,457,662
7	Parks & Recreation - South Gate Sports Center	\$19,078,910	\$597,246	\$19,676,156
8	Parks & Recreation - Westside Community Resource Center	Not available	Not available	Not available
9	Public Works Corporate Yard	\$11,319,189	\$2,383,013	\$13,702,202
10	L.A. County Fire Station #54	Not available	Not available	Not available
11	L.A. County Fire Station #57	Not available	Not available	Not available
Total Potential Losses		\$59,983,761	\$6,173,131	\$66,156,892

Analysis of the dam inundation overlay shows that the populated area vulnerable to inundation as a result of dam failure is a total of 4,706 acres. A total of approximately 95,000 residents (100 percent of the City's total population) could be affected in the event of dam inundation. In addition, 37,816 employees, or 100 percent of the people that work in South Gate, could be affected. Table 26 at the end of the chapter provides a summary of residents and employees affected by hazard.

Figure 11. South Gate Dam Failure Inundation Zones



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3.5 Vulnerability Summary

Table 25 shows a summary of critical facilities that intersect with hazard areas in the City of South Gate. Those facilities that intersect with a hazard area are indicated with a “Y” and a red-shaded cell. Facilities that do not fall within the hazard area are designated by an “N” and a blue-shaded cell. The risks of drought, extreme heat, severe weather, and disease and pest management hazards are equal throughout the community and, as a result, hazard and critical facility overlays were not conducted for these profiles. Overlays were conducted for seismic hazards (including liquefaction), hazardous materials, flood, and dam failure.

Table 26 shows the populated area by acreage potentially affected, broken out by hazard, and the number of residents and employees that would potentially be affected by each hazard based on the hazard locations mapped throughout this document.

Significant Hazards

The vulnerability/risk assessments in each hazard profile are used to understand the varying levels of risk to critical facilities in the City of South Gate. Based on these assessments, the planning team concluded that the hazards that pose the greatest risk to the City are drought, seismic hazards, extreme heat, and severe weather.

Table 25. Risk Assessment Summary Table

	Facility	Drought	Seismic Hazards (Liquefaction)	Extreme Heat	Hazardous Materials (500 ft of hazmat site)	Severe Weather (Wind)	Flood (500 ft of 100-year floodplain)	Disease / Pest Management	Dam Failure
1	City of South Gate Civic Center	Y	Y	Y	Y	Y	N	Y	Y
2	Parks and Recreation - Administration	Y	Y	Y	Y	Y	N	Y	Y
3	Parks and Recreation - Hollydale Community Resource Center	Y	Y	Y	N	Y	N	Y	Y
4	Parks and Recreation - South Gate Girls Clubhouse	Y	Y	Y	Y	Y	N	Y	Y

	Facility	Drought	Seismic Hazards (Liquefaction)	Extreme Heat	Hazardous Materials (500 ft of hazmat site)	Severe Weather (Wind)	Flood (500 ft of 100-year floodplain)	Disease / Pest Management	Dam Failure
5	Parks and Recreation - South Gate Golf Course	Y	Y	Y	N	Y	N	Y	Y
6	Parks and Recreation - South Gate Senior Center	Y	Y	Y	N	Y	N	Y	Y
7	Parks and Recreation - South Gate Sports Center	Y	Y	Y	N	Y	N	Y	Y
8	Parks and Recreation - Westside Community Resource Center	Y	Y	Y	N	Y	N	Y	Y
9	Public Works Corporate Yard	Y	Y	Y	Y	Y	N	Y	Y
10	L.A. County Fire Station #55	Y	Y	Y	Y	Y	N	Y	Y
11	L.A. County Fire Station #57	Y	Y	Y	Y	Y	N	Y	Y
Y denotes that the critical facility intersects the hazard layer					N denotes that the critical facility does not intersect the hazard layer				

Table 26. Populated Area and Number of Residents and Employees Affected

	Drought	Seismic Hazards (Liquefaction)	Extreme Heat	Hazardous Materials (1,000 ft)	Severe Weather (Wind)	Flood (500 ft of 100-year flood zone)	Disease and Pest Mgmt	Dam Failure
Total Populated Area Affected (Acres)	4,706	4,706	4,706	2,868	4,706	502	4,706	4,706
Total Number of Residents Affected (% of City population)	95,000 (100%)	95,000 (100%)	95,000 (100%)	48,288 (51%)	95,000 (100%)	944 (1%)	95,000 (100%)	95,000 (100%)
Total Number of Employees Affected	37,816 (100%)	37,816 (100%)	37,816 (100%)	19,026 (50%)	37,816 (100%)	352 (1%)	37,816 (100%)	37,816 (100%)

Potential Losses

Table 27 ranks the critical facilities by value (combination of building replacement and contents value) in the City. Should a hazard completely destroy these facilities, their replacement will be the most costly compared to other critical facilities identified in Appendix C.

Table 27. Most Costly South Gate Critical Facilities

Map Number	Facility	Total (Replacement and Contents) Value*
1	City of South Gate Civic Center	\$21,341,960
7	Parks & Recreation South Gate Sports Center	\$19,676,156
9	Public Works Corporate Yard	\$13,702,202
2	Parks & Recreation - Administration	\$5,870,636
4	Parks & Recreation - South Gate Girls Clubhouse	\$2,690,610
6	Parks & Recreation - South Gate Senior Center	\$1,457,662
3	Parks & Recreation - Hollydale Community Resource Center	\$1,262,800
5	Parks & Recreation - South Gate Golf Course	\$154,866
8	Parks & Recreation - Westside Community Resource Center	Not available
10	L.A. County Fire Station #54	Not available
11	L.A. County Fire Station #57	Not available
*Replacement value information based on City-insured values for each facility.		

CHAPTER 4: MITIGATION ACTIONS

Hazard mitigation measures are strategies and policies to reduce the impacts of hazard events on South Gate residents, businesses, public infrastructure, and facilities. This section of the Plan is informed by the physical and socioeconomic conditions in South Gate, as well as the scope and severity of potential hazard events. These measures also support implementation of regional emergency plans, including the Los Angeles County 2014 All-Hazard Mitigation Plan.

4.1 Hazard Mitigation Overview

National Flood Insurance Program

In 1968, the US Congress created the National Flood Insurance Program (NFIP) to help reduce the economic impacts of flood emergencies. Communities that elect to participate in the NFIP agree to develop policies to reduce flooding risks in flood-prone areas. In exchange, the federal government makes flood insurance available to landowners in participating communities.

The City of South Gate participates in the NFIP, and development in the flood plain is governed by the City's floodplain management ordinance (Title 7, Chapter 7.47 of the South Gate Municipal Code). Under this ordinance, all new construction in flood hazard areas must comply with special development standards (as defined in the ordinance) to reduce the risk of damage from flooding.

Communities participating in the NFIP may elect to participate in another voluntary program called the Community Rating System (CRS), which was established in 1990. Communities which participate in the CRS agree to take further steps to reduce flood damage, support NFIP insurance, and develop a comprehensive floodplain management effort. Communities receive a rating for these efforts, from 10 to 1 (with 1 being the best). If the community's rating is 9 or better, NFIP policy holders in the community receive a discount on their insurance premiums proportional to the CRS rating, from 5 percent to 45 percent. The City of South Gate does not currently participate in the CRS.

Repetitive Loss Properties

Some properties insured under NFIP are known as "Repetitive Loss Properties", which means that the owners have filed claims for property damage from flooding more than once. At this time, the City of South Gate is not aware of any Repetitive Loss Properties under the NFIP.

Hazard Mitigation Goals

The goals of this Plan, as identified in Section 1.1, establish desired end states in regard to public safety through hazard mitigation in South Gate. These goals guide future activities to reduce risk associated with natural disasters, and serve as checkpoints for the implementation of hazard mitigation actions.

The actions in this Plan are the strategies and policies that the City of South Gate will use to reduce the risk of potential hazards. The LHMP Team developed these measures through data collection efforts, research, and collaboration with members of the public and other agencies. The City may pursue funding to implement these actions, including the use of state and federal grant sources. Some measures work to reduce the risk from multiple hazards, while others are focused on individual hazards.

Cost-Benefit Analysis

FEMA requires that local governments analyze the benefits and costs of mitigation actions. This cost-benefit analysis is used to determine if the benefits to life and property (monetary and nonmonetary) exceed the cost of the mitigation activity. This analysis can assist communities in determining whether a mitigation measure is worth pursuing now, as a way of avoiding future impacts. The cost-benefit analysis relies on the frequency and severity of hazard situations, the future damage or impacts avoided by the measure, and the risk involved.

The cost-benefit analysis in an LHMP should, at minimum, consider the following questions:

- How many people will benefit from the action?
- How large an area of the City is affected?
- How critical are the facilities and infrastructure that benefit from the action?
- Does the action make sense for the community from an environmental perspective?

Hazard Mitigation Action Prioritization (STAPLE/E Analysis)

The LHMP Team reviewed the STAPLE/E (Social, Technical, Administrative, Political, Legal, Economic, Environmental) criteria during mitigation action development, which require that all such considerations be taken into account when considering and prioritizing the most appropriate hazard mitigation actions. This process helps ensure that the hazard mitigation measures in this Plan are the most equitable, cost-effective, and otherwise feasible for South Gate, given the unique physical and socioeconomic conditions in the community. It also incorporates the cost-benefit analysis as required by FEMA. The specific criteria used in the STAPLE/E method are included in Table 28.

Table 28.STAPLE/E Review and Selection Criteria

Issue	Criteria
Social	<ul style="list-style-type: none"> - Is the proposed measure socially acceptable to South Gate and surrounding communities? - Would the measure result in one segment of South Gate and/or surrounding communities being treated unfairly? - Will the measure result in social disruption?
Technical	<ul style="list-style-type: none"> - If fully implemented, is the measure likely to effectively reduce the risk? - Will the measure create more problems than it fixes? - Will the measure reduce a risk from a hazard, or only reduce a symptom of the risk? - Is the measure the most useful course of actions, given South Gate's goals?
Administrative	<ul style="list-style-type: none"> - Does South Gate have the administrative capabilities to implement the measure? - Is someone available to coordinate and lead measure implementation? - Is there sufficient funding, staff, and technical support for measure implementation? - Are there ongoing administrative requirements that need to be met?
Political	<ul style="list-style-type: none"> - Is the measure politically acceptable? - Is there public support to implement and maintain the measure?
Legal	<ul style="list-style-type: none"> - Does South Gate have the authority to implement the measure? - Are there legal side effects to implement the measure (e.g., could it be construed as a taking?) - Will South Gate be liable for any action or lack of action? - Will the measure face legal challenges?
Economic	<ul style="list-style-type: none"> - What are the economic costs and benefits of the measure, and do the benefits exceed the cost? - Are start-up, maintenance, and administrative costs taken into account? - Has funding for the measure been secured? If not, what are the potential funding sources? - How will the measure affect South Gate's fiscal capability? - What sort of burden, if any, will the measure place on the local economy or tax base? - What, if any, are the budget and revenue effects of the measure?
Environmental	<ul style="list-style-type: none"> - How will the measure affect the environment? - Will the measure need environmental regulatory approvals? - Will the measure meet local and state regulatory requirements? - Is the measure likely to affect any endangered or threatened species?

4.2 Hazard Mitigation Measures

Table 29 identifies the proposed mitigation actions for South Gate, based on the risk assessment in Chapter 3, the capabilities assessment discussed later in this chapter, the Los Angeles County 2014 All-Hazards Mitigation Plan, discussion among the LHMP Team, and public outreach. This table also identifies the City department responsible for implementation, potential funding source(s), opportunities for integration with other City policy or planning frameworks, the target completion year, and priority ranking for each action. Priority rankings for mitigation actions were developed by the LHMP Team during Meeting #3. At this meeting, Team members used a dot prioritization exercise to establish the priorities identified.

Table 29. Hazard Mitigation Actions

Mitigation Action	Responsible Department	Potential Funding Sources	Policy Integration Opportunities	Target Completion Date	Priority
1. Multiple Hazards					
<p>1.1 Update and expand the City's Street Tree Master Plan to cover the following topics:</p> <ul style="list-style-type: none"> • Attaining "Tree City USA" designation. • Tree maintenance including canopy and root maintenance with an emphasis on maintaining buffers between canopies and critical infrastructure. • Drought-tolerant and shade-providing tree palettes. • Tree vulnerability to high winds, with direction to replace vulnerable trees with more resilient species. • Mitigating tree pest and disease impacts. • Actions and funding sources expand the City's shade tree stock. • Best practices for private property plant selection and tree maintenance. <p><i>Hazards mitigated: drought, extreme heat, severe weather</i></p>	Public Works	General Fund, grant funding, development fees	Street Tree Master Plan	2016	High
<p>1.2 Work with utility companies and non-City agencies, including Southern California Edison, Southern California Gas Company, Los Angeles Metro, and telecommunication providers, to harden infrastructure to be more resilient to hazard situations, helping to provide safe service during emergency situations and to quickly fix any service interruptions.</p> <p><i>Hazards mitigated: seismic hazards, severe weather, flood</i></p>	Community Development, Public Works	General Fund	N/A	2017	Medium

Mitigation Action	Responsible Department	Potential Funding Sources	Policy Integration Opportunities	Target Completion Date	Priority
<p>1.3 Expand participation in the NotifyMe program to notify the community in the event of an occurring or imminent hazardous situation, including a need to evacuate. The program should support all commonly spoken languages and can be advertised through multiple methods (door-to-door notifications, phone, television, radio, and online/social media). Coordinate with the Los Angeles County Operational Area for best practices and for consistency with notification systems for surrounding communities.</p> <p><i>Hazards mitigated: drought, seismic hazards, extreme heat, hazardous materials, severe weather, flood, disease/pest management, dam failure</i></p>	City Manager, Police	General Fund, grant funding	N/A	2017	Medium
<p>1.4 Conduct a comprehensive and ongoing education campaign to improve awareness of hazard threats and ways to reduce risks. The campaign should include mailings, in-person workshops and events, and media notifications (television, radio, online/social media, etc.). The campaign should be designed to reach all members of the community, and should include materials in commonly spoken languages in the community, including English and Spanish.</p> <p><i>Hazards mitigated: drought, seismic hazards, extreme heat, hazardous materials, severe weather, flood, disease/pest management, dam failure</i></p>	City Manager, Police	General Fund, grant funding	N/A	2017	Medium

Mitigation Action	Responsible Department	Potential Funding Sources	Policy Integration Opportunities	Target Completion Date	Priority
<p>1.5 Update all emergency-related planning documents every five years to ensure consistency with state and federal law, best practices, local conditions, and recent science. Integrate the hazards research findings and actions in this Local Hazard Mitigation Plan with all City emergency planning efforts and programs.</p> <p><i>Hazards mitigated: drought, seismic hazards, extreme heat, hazardous materials, severe weather, flood, disease/pest management, dam failure</i></p>	Community Development and Police Department	General Fund, grant funding	Emergency Operations Plan, Hazard Mitigation Plan, Safety Element	2017	Medium
<p>1.6 Adopt, implement, and actively enforce the current state building code.</p> <p><i>Hazards mitigated: drought, seismic hazards, extreme heat, flood</i></p>	Community Development	General Fund, development fees	Municipal Code	Ongoing	Low
<p>1.7 Adopt a policy to avoid siting new critical public facilities and infrastructure in areas of elevated vulnerability to flooding and seismic hazards. If siting such facilities in areas of elevated vulnerability is unavoidable, design facilities to remain operable during emergency situations to the greatest extent feasible.</p> <p><i>Hazards mitigated: seismic hazards, flood</i></p>	City Manager	General Fund, bonds, Capital Improvement funds	N/A	2019	Low
<p>1.8 Coordinate with LA County Public Works to designate Firestone Boulevard as an official County Disaster Route.</p> <p><i>Hazards mitigated: seismic hazards, hazardous materials, severe weather, flood, dam failure</i></p>	Public Works	General Fund	N/A	2019	Low

Mitigation Action	Responsible Department	Potential Funding Sources	Policy Integration Opportunities	Target Completion Date	Priority
1.9 Monitor and pursue hazard mitigation funding opportunities. <i>Hazards mitigated: drought, seismic hazards, extreme heat, hazardous materials, severe weather, flood, disease/pest management, dam failure</i>	Community Development, Police, Public Works	General Fund	N/A	Ongoing	Low
2. Drought					
2.1 Identify and pursue alternative sources of water in coordination with WRD to support potential shortages of deliveries from the Metropolitan Water District.	Public Works	Water Funds	N/A	Ongoing	Medium
2.2 Work with regional partners, including the Los Angeles Unified School District and the Central Basin Water District, to develop a recycled water master plan, with the intention of identifying financially feasible approaches to expanding recycled water infrastructure throughout the City.	Public Works	Water Funds	N/A	2019	Low
2.3 Construct additional or upgrade existing water storage/ conveyance facilities.	Public Works	Water Funds	N/A	2019	Low
2.4 Offer reduced-cost or free water audits for residents and businesses.	Public Works	Water Funds	N/A	Ongoing	Low
2.5 Publicize available rebates and other financial incentives for equipment that reduces water use.	Public Works	Water Funds	N/A	Ongoing	Low
2.6 As part of discretionary review, encourage new residential buildings in a recycled water service area to include dual plumbing for potable and nonpotable water sources.	Community Development	Water Funds	Project Review Process	Ongoing	Low
2.7 Continue retrofitting publicly landscaped areas with artificial turf or drought-tolerant landscaping.	Parks and Recreation, Public Works	Water Funds	N/A	Ongoing	Low

Mitigation Action	Responsible Department	Potential Funding Sources	Policy Integration Opportunities	Target Completion Date	Priority
2.8 Require Urban Water Management Plan updates to consider more severe and long-lasting drought scenarios.	Public Works	Water Funds	Urban Water Management Plan	2017	Low
3. Seismic Hazards					
3.1 Retrofit City-owned facilities and infrastructure, including water storage tanks, to increase resiliency to seismic hazards and to remain operable immediately after seismic events.	City Manager, Public Works	General Fund, bonds, Capital Improvement funding	N/A	2017	High
3.2 If deemed necessary, conduct a seismic study for public buildings and infrastructure and retrofit facilities based on findings and available funding.	Community Development, Public Works	General Fund, grant funding	N/A	2018	Medium
3.3 Conduct a seismically vulnerable private building inventory, with a focus on unreinforced masonry and "soft-story" buildings, and develop a prioritized list of recommended phasing for retrofits.	Community Development	General Fund, grant funding, development fees	N/A	2018	Medium
3.4 Adopt a phased ordinance for seismic retrofits to require existing unreinforced buildings to meet current seismic standards. Identify and secure to the extent possible funding to assist property owners with retrofit costs.	Community Development	General Fund, development fees	Municipal Code	2018	Medium
3.5 In coordination with state and regional agencies, conduct seismic evaluations of infrastructure owned by other agencies in the City, including electrical wires and natural gas pipelines, and identify funding sources to conduct seismic retrofits of vulnerable infrastructure.	Public Works	General Fund	N/A	2018	Medium

Mitigation Action	Responsible Department	Potential Funding Sources	Policy Integration Opportunities	Target Completion Date	Priority
4. Extreme Heat					
4.1 On public facilities, conduct energy-efficiency audits, retrofit buildings to increase efficiency, and install solar panels to reduce demand on the electrical grid (increasing its resiliency during heat waves) and to save money and generate municipal revenue.	City Manager, Public Works	General Fund, grant funding, bonds, Capital Improvement funding	N/A	2017	Medium
4.2 Encourage solar panels on new and existing developments by widely publicizing available incentives and financing options, working with local PACE providers to expand outreach to lower-income and non-English-speaking neighborhoods, and participating in programs to reduce the cost of solar panels for residents.	Community Development	General Fund	N/A	2017	Medium
4.3 Require new nonresidential and multifamily development to incorporate high-reflectivity roofing and surface materials, shade trees, shade structures, and/or other infrastructure features to reduce human exposure to extreme heat and to mitigate the urban heat island effect.	Community Development	General Fund, development fees	Municipal Code	2017	Medium
4.4 Upon discretionary review for significant remodels, require owners of existing parking lots to install infrastructure features to increase shade and reduce the urban heat island effect.	Community Development	General Fund, development fees	Project Review Process	2017	Medium
4.5 Work with community groups to identify and secure funding to install energy-efficient air conditioner units for homes without AC access, particularly for homes of lower-income residents, the elderly, and persons with disabilities.	Community Development	General Fund, grant funding	N/A	2019	Low

Mitigation Action	Responsible Department	Potential Funding Sources	Policy Integration Opportunities	Target Completion Date	Priority
4.6 Educate all outdoor City workers, including construction, landscaping, maintenance, and recreation staff, about the risks posed by extreme heat and how to reduce them.	Administrative Services	General Fund	N/A	2019	Low
4.7 Include extreme heat as a hazard in the City's Emergency Operations Plan with clear guidelines to: <ul style="list-style-type: none"> Designate public buildings and other community facilities as cooling centers that are easily accessible by all residents in all parts of South Gate, including individuals with limited mobility. Distribute information about cooling centers. Establish a temperature threshold as a minimum standard for opening and operating cooling centers. 	Police	General Fund	Emergency Operations Plan	2019	Low
5. Hazardous Materials					
5.1 As part of the development review process, require all hazardous material storage tanks meet or exceed all required and recommended safety standards, including resiliency to natural hazards such as flooding and seismic hazards.	Community Development	General Fund, development fees	Project Review Process	2017	Medium
5.2 Consult with Union Pacific Railroad (UPRR) on potential land use issues and safety concerns associated with the railroad rights-of-way in the City. As part of the consultation, UPRR should provide the City with its emergency response and recovery plans for assets located in the City.	Community Development	General Fund	N/A	2017	Medium

Mitigation Action	Responsible Department	Potential Funding Sources	Policy Integration Opportunities	Target Completion Date	Priority
5.3 As part of the development review process, continue to require soil testing for hazardous materials prior to construction activity, and to deny permits if risks from any hazardous materials are not mitigated to a generally safe level.	Community Development	General Fund, development fees	Project Review Process	2019	Low
5.4 Review the zoning ordinance and map and amend allowed uses to prevent siting facilities which may manufacture, store, use, transport, or allow hazardous materials near residential areas or other sensitive uses.	Community Development	General Fund	Municipal Code; Zoning Map	2019	Low
6. Flooding					
6.1 Upgrade storm drain infrastructure in areas that frequently pond during strong rains.	Public Works	General Fund, bonds, Capital Improvement funding	N/A	Ongoing	High
6.2 Analyze the flood potential associated with elevated reservoir failure in the community.	Community Development, Public Works	General Fund	N/A	2017	High
6.3 Monitor the effectiveness of current requirements for new developments to handle stormwater on-site, to the extent possible, through the use of permeable paving and other low-impact development strategies, and update the requirements as needed.	Community Development, Public Works	General Fund, development fees	N/A	2017	Medium
6.4 Retrofit public spaces to reduce stormwater runoff, including using permeable paving for sidewalks and parking lots.	Public Works	General Fund, bonds, Capital Improvement funding	N/A	Ongoing	Medium
6.5 Provide educational materials to existing property owners about the benefits of installing low-impact development stormwater components.	Public Works	General Fund	N/A	2018	Low

Mitigation Action	Responsible Department	Potential Funding Sources	Policy Integration Opportunities	Target Completion Date	Priority
6.6 Continue to participate in the National Flood Insurance Program and maintain an effective and up-to-date Flood Plain Management Ordinance.	Community Development	General Fund	N/A	Ongoing	Low
6.7 Continue and expand the regular cleaning and maintenance of City storm drains to ensure they are functioning at full capacity.	Public Works	General Fund, Capital Improvement funding	N/A	Ongoing	Low
6.8 Continue requiring new development projects to reduce potential and existing flooding hazards as part of the development process.	Community Development	General Fund, development fees	Project Review Process	Ongoing	Low
7. Severe Weather					
7.1 Design future key infrastructure to withstand severe weather events beyond minimum code specifications.	City Manager	General Fund, bonds, Capital Improvement funding	N/A	2019	Low
7.2 Monitor trees and other vegetation near power lines, and promptly inform utility companies if any vegetation may threaten power service during severe weather and/or requires trimming.	Public Works	General Fund	N/A	Ongoing	Low
8. Disease and Pest Management					
8.1 Coordinate with the Los Angeles County Department of Public Health to ensure South Gate residents have access to affordable flu vaccinations, and that community members are notified about the availability of flu vaccines.	City Manager	General Fund	N/A	2019	Low

Mitigation Action	Responsible Department	Potential Funding Sources	Policy Integration Opportunities	Target Completion Date	Priority
8.2 Work with the Greater Los Angeles County Vector Control District to implement pest management strategies to reduce health risks from disease vectors, to treat/reduce areas of standing water where mosquitoes may breed, and to support additional mosquito mitigation actions as needed.	City Manager	General Fund	N/A	2019	Low
9. Dam Inundation					
9.1 Work with the US Army Corps of Engineers and the Metropolitan Water District to support retrofit activities for dams that may pose an inundation risk for South Gate.	Community Development, Public Works	General Fund	N/A	2017	Medium

4.3 Capabilities Assessment

The capabilities assessment identifies existing local agencies, personnel, planning tools, public policy and programs, technology, and funding resources that can support the hazard mitigation measures in this Plan. This assessment helps determine the current ability of South Gate to reduce damage from hazard events, providing a foundation to develop, consider, and prioritize future hazard mitigation measures.

Key Resources

Table 30 summarizes the existing capabilities available to support the City’s implementation of mitigation actions.

Table 30. South Gate Capabilities Assessment

Supporting Resource Type	Supporting Resource Name	Ability to Support Local Hazard Mitigation Activities
Personnel	Police Department staff	Staff helps to develop and implement actions to improve emergency preparedness, including conducting education and outreach. Staff also conducts emergency response activities and contributes to disaster recovery.
Personnel	Code Enforcement Division staff	The Code Enforcement Division works to ensure that all property in the city complies with adopted codes. This includes ensuring that property in South Gate meets or exceeds minimum standards for safety and resiliency to hazards.
Personnel	Building and Safety Division staff	Staff reviews all proposals for new development in South Gate to ensure it meets all applicable laws and ordinances. As part of this review process, staff can ensure that new development complies with all hazard-related requirements.
Personnel	South Gate Housing Authority staff	Staff helps residents find and maintain decent and affordable housing in South Gate, including housing that meets minimum safety requirements.
Personnel	Planning Commission	The South Gate Planning Commission meets twice a month to review land use, development, planning, and environmental issues. The body can approve and guide development of new projects, as well as new policies related to land use issues.
Personnel	City Council	The South Gate City Council meets twice a month and serves as the primary legislative body for the community. The City Council can establish and revise laws, approve plans and policy directions, and allocate funding.
Personnel	City Manager	The City manager allocates and manages City resources to carry out City policy and operations as directed by the City Council, including allocating and managing staff and funding to support implementation of hazard mitigation activities.
Personnel	Finance Department staff	Finance Department staff monitors and analyzes City revenue and expenses, and drafts budget documents in accordance with City Council directions. This can include proposing funds for hazard mitigation activities and securing funding for these activities from external sources, such as state and federal grants.

Supporting Resource Type	Supporting Resource Name	Ability to Support Local Hazard Mitigation Activities
Personnel	Public Works Department staff	Staff in the Public Works Department is responsible for building and maintaining South Gate's publicly owned infrastructure, including the City's water service. Staff can construct and retrofit infrastructure to reduce hazard risks in the community, or to be more resilient to hazard events.
Personnel	Human Resources Division staff	The Human Resources/Risk Management Division is responsible for establishing policies related to City personnel, including training on hazard events, emergency response protocols, and hazardous materials.
Personnel	City Attorney	The City Attorney reviews proposed ordinances and resolutions, and ensures that City activities (including hazard mitigation actions) comply with all applicable laws.
Personnel	Waste Management, Inc. staff	The City contracts with Waste Management to provide collection and disposal services for solid waste in the community. The responsibilities of Waste Management staff include providing services for the safe disposal of some types of hazardous material.
Personnel	Southern California Edison staff	Southern California Edison is responsible for providing safe and reliable electricity to South Gate community members. Staff responsibilities include restoring electrical service if it has been interrupted by an emergency situation, and repairing and maintaining electrical infrastructure to reduce the risk of hazard events.
Personnel	Southern California Gas Company staff	The Southern California Gas Company provides natural gas service in South Gate. Staff is responsible for maintaining the natural gas infrastructure in safe conditions to minimize the risk of leaks, fires, or explosions. This includes repairing natural gas infrastructure following emergency situations.
Personnel	Los Angeles County Fire Department staff	The Los Angeles County Fire Department provides fire services to South Gate. Staff is responsible for conducting safety training and preparedness activities, responding to emergency situations, and supporting emergency recovery. Staff also responds to hazardous material emergencies and conducts activities to reduce the risk of hazardous material-related events.
Plan	General Plan	The General Plan is the main policy document for development and change in South Gate. It identifies the overarching policies and programs that affect land use, public services, housing, natural resources, and safety, among other items. The General Plan can be updated to include information and mitigation measures identified in this Plan.
Plan	Urban Water Management Plan	The South Gate Urban Water Management Plan identifies the community's current and forecasted water sources and demands and discusses supply reliability and contingency planning, demand management, and recycled water. In accordance with state law, the plan is updated every five years.

Supporting Resource Type	Supporting Resource Name	Ability to Support Local Hazard Mitigation Activities
Plan	South Gate Emergency Operations Plan	Overall emergency management plan for the City of South Gate that identifies the procedures and protocols for disaster and emergency situations within the City and roles and responsibilities for City Departments/Personnel to assist with response activities.
Plan	Los Angeles County Operational Area Emergency Response Plan	This plan establishes the protocols for responding to emergency situations in Los Angeles County, including how South Gate staff should coordinate response activities with other jurisdictions. The plan works to reduce loss of life, injuries, and property damage during and immediately after emergency situations.
Plan	Los Angeles County All-Hazard Mitigation Plan	This plan identifies hazards and establishes mitigation activities for unincorporated areas of Los Angeles County and for County agencies (including the Los Angeles County Fire Department, which provides services to South Gate).
Policy	Floodplain Management ordinance	The ordinance establishes additional standards for development activities in the floodplain, enforced by the Building and Safety Division staff. This ordinance can be amended to implement additional flood mitigation strategies.
Policy	Building code	The building code specifies how all new construction in the City shall be built. These requirements can be amended to require new construction to be more resilient to emergency situations.
Policy	Fire code	The fire code contains specific fire safety requirements for all structures. These requirements can be modified to require increased fire safety measures.
Policy	City Budget	The South Gate City Council adopts a budget every fiscal year, which identifies sources of revenue for the City and how this money will be spent. The budget can direct funding toward hazard mitigation activities, including increased staffing, planning efforts, and capital improvements.
Policy	Development code	The code contains land use regulations, including requirements for all new construction. The code can be used to implement hazard mitigation measures related to land use and development.
Policy	Water Conservation ordinance	South Gate's Water Conservation ordinance establishes mandatory and permanent water conservation activities for all South Gate residents and businesses, as well as additional mandatory standards for various stages of water shortage events. These standards help mitigate the impact of drought-related emergency events.
Policy	Tree Preservation and Protection ordinance	South Gate's Tree Preservation and Protection ordinance regulates the planting, maintenance, and removal of public trees in the community. Public trees can help to mitigate some types of hazards, and this ordinance can be amended to support additional mitigation activities.

Supporting Resource Type	Supporting Resource Name	Ability to Support Local Hazard Mitigation Activities
Policy	Storm Drains ordinance	The Storm Drains ordinance governs the use and maintenance of the storm drain system in South Gate. This infrastructure can help mitigate damage from flood-related emergency situations.

Fiscal Capabilities

This section summarizes South Gate’s fiscal capabilities, as determined by the City’s financial resources and allocated budget. According to budget summaries for recent fiscal years, South Gate receives most of its revenue from sales and property taxes. The greatest share of the City’s General Fund (approximately half) is allocated to the Police Department, followed by the Parks & Recreation Department and various administrative functions (including the Finance Department, City Council, City Manager, Treasurer, and City Clerk), with smaller amounts going to the Public Works and Community Development Departments.

City of South Gate Department Overview

City departmental budgets are used to employ City staff members who are an integral part of the mitigation planning process. The following list describes City leadership and staff positions by department:

- The City Council comprises a Mayor, Vice Mayor, and three City Council members and is supported by the City Manager, City Treasurer, and support staff.
- The Parks and Recreation Department includes the Director, Deputy Parks Director, Parks Superintendent, and support staff.
- The Administrative Services Department includes the Director, and two Deputy Directors and support staff.
- The Community Development Department includes a Director, Senior Planner, Building Official, Code Enforcement Manager, Housing Administrator, and supporting staff.
- The Public Works Department includes a Director of Public Works/ City Engineer, Field Operations Manager, Assistant City Engineer, Sewer Superintendent, Equipment Superintendent, Electrical Superintendent, Water Division Manager, and support staff.
- The Police Department employs a Chief, command staff, police officers, an emergency manager, and public safety staff.

Capital Improvement Program (FY 2016–17)

The Capital Improvement Program budget is an important part of the City’s budget. The FY 2016/2017 budget presents over 50 capital improvement projects with expenditures totaling over \$70 million. These projects provide funding for needed repairs, replacements, and improvements to streets, water infrastructure, parks, public buildings, vehicles, and equipment.

Los Angeles County Fire Department

The City of South Gate is part of the Consolidated Fire Protection District of Los Angeles County, which is served by the Los Angeles County Fire Department. In addition, the fire department provides public education programs to schools, businesses, community associations, child care providers, and other members of the community. It also coordinates the inspection of commercial buildings, investigates fires, and enforces hazardous materials regulation. Fire services are paid through a special tax assessment on each property in the City.

CHAPTER 5: PLAN MAINTENANCE

This Plan must remain up-to-date in order to continue to help protect the community against hazards and to remain eligible for federal and state funding. To that end, this chapter contains a schedule for plan monitoring, evaluation, and revision. It describes how the City will incorporate mitigation actions in the Plan into existing policies and programs, including the South Gate General Plan and City Budget.

Public participation was an integral component of developing this Plan, and it will continue to be critical during Plan maintenance activities. This chapter also describes how public participation will be involved in Plan maintenance.

5.1 Coordinating Body

The South Gate LHMP Team will continue to be responsible for Plan maintenance. As noted in Chapter 1, the LHMP Team is made up of representatives from the following departments:

- City of South Gate Administrative Services Department
- City of South Gate Community Development Department
- City of South Gate Parks & Recreation Department
- City of South Gate Police Department
- City of South Gate Public Works Department
- Los Angeles County Fire Department
- Los Angeles County Office of Emergency Management

Representatives from these agencies will coordinate the maintenance of this Plan, including undertaking a formal review and update of the Plan as specified. The City of South Gate Community Development Department will facilitate meetings of the LHMP Team and will coordinate required tasks among the participating agencies. All members of the LHMP Team have a shared responsibility for the implementation and evaluation of this Plan.

5.2 Plan Evaluation

The LHMP Team will meet at least once annually, beginning one year after adoption, to evaluate implementation progress and integration of mitigation actions into other documents. As part of this evaluation process, members of the LHMP Team should look at the following:

- Any hazard events that occurred in South Gate within the past year, and the scope of their impacts.
- Mitigation activities in the Plan which have been implemented and are achieving success.
- The timeline for implementation of mitigation activities, and whether the timeline should be amended.

- Any mitigation activities prioritized for the past year which have not been completed, and why.
- The need for any new or revised mitigation actions.
- Any changes or potential for changes in funding options for mitigation activities.
- Any new scientific data or mapping that informs the information in the Plan.
- Any new or revised planning programs or other initiatives applicable to South Gate that involve hazard mitigation.

The LHMP Team will prepare an annual progress report, which will be distributed to City department heads for review, and will be presented to the City Council. It will be posted on the City of South Gate website, with the ability for members of the public to provide comments. This annual report will also be provided to local media as a press release. The plan evaluation process will commence one year after City Council adoption.

5.3 Method and Schedule for Plan Update

Title 44 of the Code of Federal Regulations, Section 201.6(d)(3), requires that local hazard mitigation plans be reviewed, revised if necessary, and resubmitted to FEMA for approval in order for the community to remain eligible for the benefits awarded under the DMA. The City intends to update the Plan on a five-year cycle from the date of the initial plan adoption. This update process should occur one year prior to the expiration of the existing plan, although it may be accelerated to less than five years based on the following triggers:

- A state or federal declaration disaster that impacts the City of South Gate.
- A hazard event that results in the loss of life.

The update process will allow the City to add new planning process methods, community profile data, hazard data and events, vulnerability analyses, mitigation actions, and goals to the Plan. Due to this update process, the Plan should always be current and up-to-date.

The LHMP Team will carry out the update process, which will include the following steps:

- Review and update the risk assessment based on the best and most recent available information and technologies.
- Evaluate the mapping and lists of critical structures, and update and improve as necessary and as funding becomes available.
- Review and revise the list of mitigation actions to account for any actions that are completed, postponed, changed to account for revisions in the risk assessment, or changed to account for new or revised City policies identified by other planning mechanisms.
- Send the draft update to the appropriate agencies for review and comment.
- Provide members of the public an opportunity to comment on the draft update, and revise the draft as appropriate based on public comment.

- Transmit the draft update to the California Office of Emergency Services (Cal OES) and FEMA for review and approval.

The South Gate City Council is responsible for the final adoption of the Plan, following notification from FEMA that the Plan is Approved Pending Adoption (APA). The South Gate Community Development Department will transmit the Plan to FEMA following adoption by the City Council.

5.4 Implementation through Existing Programs

The effectiveness of this Plan depends on the implementation of the mitigation actions, and incorporating these actions into other City plans, policies, and programs. These mitigation actions provide the framework for activities that the City can implement over the next five years. The City has prioritized the actions in this Plan, which will be implemented through existing plans, policies, and programs as resources become available. The LHMP Team is responsible for implementing the mitigation actions in the Plan.

The information on hazards and risks, vulnerability, and mitigation in this LHMP is based on the best and most recent available information, technology, and resources available at the time this LHMP was prepared. The City of South Gate's General Plan, particularly the Safety Element, is integral to the success of this LHMP, as the Safety Element creates the framework for the Plan to expand upon. The General Plan and this LHMP are complementary documents that work together to reduce the risk of hazards to the residents and businesses of South Gate. Many of the ongoing recommendations identified in the mitigation activities are recommended by the General Plan and other adopted plans, such as the City of South Gate budget and Capital Improvements Program.

5.5 Continued Public Involvement

The residents and businesses of South Gate will continue to be informed of and involved in the LHMP update process. When the LHMP update process begins, a new public involvement strategy will be developed based on guidance from the LHMP Team. This involvement strategy will be based on the needs and capabilities of the City at the time of the update. This strategy will at least include the use of the City's website and local media to inform the public and to gather public feedback.

5.6 Point of Contact

The preparation and future update of South Gate's LHMP will be carried out by the LHMP Team, with participation by and support from the City's Community Development Department. The primary contact for this department is:

Alvie Betancourt

Email: abetancourt@sogate.org

Phone: 323-563-9500

APPENDIX A – LHMP TEAM DOCUMENTS

1. LHMP TEAM MEETING DOCUMENTATION

Meeting Materials

South Gate Local Hazard Mitigation Plan and Safety Element Update Project Management Team

Kickoff Meeting: July 14, 2015

Included Materials:

- Meeting agenda
- Project Overview
- Hazard Mitigation Planning Team
- LHMP Technical Advisory Committee
- Project Schedule
- Sign-In Sheet
- Presentation

City of South Gate

Local Hazard Mitigation Plan and Safety Element Update

Kick-off Meeting

Tuesday July 14th, 1:00 – 3:00 p.m.

South Gate City Hall, 8650 California Ave

Agenda

1. Introductions (5 minutes)
2. Project Goals & Expectations (10 minutes)
3. Staffing & Communication Protocols (5 minutes)
4. Project Overview (25 minutes)
 - a. Local Hazard Mitigation Plan
 - b. Safety Element
5. Engagement & Outreach (30 minutes)
 - a. LHMP/Safety Element Planning Team
 - b. Public Outreach Approach
6. Data Collection & Critical Facilities (20 minutes)
7. Work Plan & Schedule Review (10 minutes)
 - a. Overview of work program, key tasks, and schedule
 - b. Wrap-up and next steps

Project Overview

The City of South Gate is initiating a planning effort to prepare a Local Hazard Mitigation Plan (LHMP) and updated General Plan Safety Element. This integrated planning effort will maximize the City's eligibility for future grant funding.

Local Hazard Mitigation Plan

DMA 2000 (Public Law 106-390) provides the legal basis for FEMA mitigation planning requirements for State, local and Indian Tribal governments as a condition of mitigation grant assistance. DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by repealing the previous mitigation planning provisions and replacing them with a new set of requirements that emphasize the need for State, local, and Indian Tribal entities to closely coordinate mitigation planning and implementation efforts. The requirement for a State mitigation plan is continued as a condition of disaster assistance, adding incentives for increased coordination and integration of mitigation activities at the State level through the establishment of requirements for two different levels of state plans. DMA 2000 also established a new requirement for local mitigation plans and authorized up to 7 percent of HMGP funds available to a State for development of State, local, and Indian Tribal mitigation plans.

Completion and acceptance of the City's LHMP by FEMA opens up access to the following competitive FEMA grant programs for the next 5 years:

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)

Under these programs up to 75% of the cost of an implementation project could be covered by a FEMA grant.

Safety Element

Assembly Bill 2140 amended California Government Code Sections 8685.9 and Section 65302.6 to enable local jurisdictions to receive additional post-disaster funding if the LHMP is linked to the General Plan Safety Element and consistent with the Disaster Mitigation Act of 2000. To maximize this potential benefit to the City, the project includes preparation of a Safety Element that is linked to the LHMP.

California Government Code Section 65302(g)(1) requires that a general plan include a safety element for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence, liquefaction, and other seismic hazards identified pursuant to Chapter 7.8 (commencing with Section 2690) of Division 2 of the Public Resources Code, and other geologic hazards known to the legislative body; flooding; and wildland and urban fires. Consistent with Assembly Bill (AB) 739 (California Government Code Sections 8685.9 and 65302.6), and in order to maximize the benefits of public safety planning, the Safety Element will integrate the background research and policy recommendations contained in the LHMP update.

Preliminary Goals of the Project

At the kick-off meeting, the project team will have the opportunity to discuss and confirm project goals. Based on the initial project kickoff, discussion with City staff, and guidance from the General Plan, preliminary goals to consider include the following:

1. Achieve certification of the LHMP by FEMA for Pre-Disaster Mitigation grant funding eligibility.
2. Encourage appropriate flood control and prevent negative impacts of new development on flood-control efforts (South Gate General Plan, Green City Element, Objective GC 4.1).
3. Promote coordination between land-use planning and urban design, and law enforcement (South Gate General Plan, Public Facilities Element, Objective PF 1.2).
4. Ensure that all new development includes adequate provision for fire safety (South Gate General Plan, Public Facilities Element, Objective PF 2.2).

Project Objectives as discussed with City Staff

The PMC project manager and key City staff participated in an initial kickoff on June 8, 2015. The management team identified the following objectives during the June 8 kickoff:

- A. Continued coordination with key stakeholders and other agencies.
 - a. Who are key stakeholders to contact?
- B. A flexible and engaging public outreach campaign.
 - a. What are the lessons learned from previous outreach events?
- C. Foster better communication and coordination within the City and surrounding areas.
 - a. What Cities/Agencies should be contacted regarding this project?
- D. Address aging infrastructure issues to reduce/minimize future hazards and disasters.
 - a. What infrastructure is at risk in your opinion?

South Gate Hazard Mitigation Planning Team

This core team of City staff members will participate in actively reviewing and commenting on the City's Local Hazard Mitigation Plan and Safety Element. The following is a listing of City departments that should be involved. At least one staff member from each department should be in attendance for any meetings scheduled for the project.

- Administrative Services - Finance
- City Clerk
- City Manager
- Community Development
- Fire (Los Angeles County Fire Department)
- Parks & Recreation
- Police
- Public Works

LHMP Technical Advisory Committee

In addition to the HMP Team, the City will convene a larger Technical Advisory Committee to review and comment on the plan/process. This Team will include all Planning Team members from above, as well as stakeholders selected by the City.

- California Highway Patrol
- City of Cudahy
- City of Downey
- City of Huntington Park
- City of Lynwood
- City of Paramount
- County of Los Angeles Public Library – South Gate Branch, Leland R. Weaver Library
- Koos Manufacturing (employer)
- Los Angeles County Regional Planning Office
- Los Angeles County Fire Department
- Los Angeles County Flood Control District
- Los Angeles Department of Water and Power
- Los Angeles Unified School District
- Water Boards
- Southern California Association of Governments
- Schultz Steel (employer)
- Southern California Edison
- South Gate Chamber of Commerce

Schedule

Draft Schedule, updated June 2015

Key	Activity	Start	End
HMP	Gather Existing Data and Documentation	7/1/2015	7/19/2015
HMP	Preparation of Critical Facilities List	7/1/2015	7/19/2015
HMP	Preparation of GIS Base Mapping	7/1/2015	7/19/2015
HMP	Kickoff Meeting/Field Reconnaissance -	7/14/2015	7/14/2015
HMP	Initiate Agency Outreach/Consultation	7/15/2015	7/31/2015
SE	Preparation of LHMP/Safety Element Document Templates	7/15/2015	7/21/2015
HMP	Administrative Draft LHMP - Hazards Profiles	7/21/2015	8/7/2015
HMP	LHMP Planning Team Meeting #1	8/12/2015	8/12/2015
SE	Safety Element Kickoff Meeting	8/12/2015	8/12/2015
SE	Review of applicable Existing General Plan Goals and Policies for Safety Element	8/10/2015	8/14/2015
HMP	Administrative Draft LHMP - Risk Assessment	8/1/2015	8/31/2015
CO	Public Outreach Survey (Online)	7/21/2015	9/1/2015
SE	Development of Safety Element Policy Framework	8/31/2015	9/14/2015
HMP	LHMP Planning Team Meeting #2	9/9/2015	9/9/2015
HMP	Administrative Draft LHMP - Mitigation Actions	9/15/2015	10/1/2015
HMP	LHMP Planning Team Meeting #3	10/07/2015	10/07/2015
HMP	Administrative Draft LHMP - Capabilities Assessment (Complete Administrative Draft LHMP)	10/12/2015	10/19/2015
SE	Administrative Draft CEQA Documents	10/1/2015	11/1/2015
SE	Administrative Draft Safety Element	9/14/2015	11/1/2015
SE	Prepare Draft Safety Element	11/15/2015	12/1/2015
SE	Draft Safety Element - Public Review Period	1/05/2016	2/05/2016
HMP	Public Review Draft LHMP	11/15/2015	12/15/2015
SE	Circulation of Draft CEQA Documents	1/05/2016	2/05/2016
HMP	Draft LHMP - Cal OES Review/FEMA Review	1/05/2016	TBD
HMP	Final LHMP		TBD
SE	Final Safety Element		3/01/2016
	Planning Commission Hearing		April 2016
	City Council Hearing		April 2016
CO	LHMP Public Outreach Meeting #1		TBD
CO	LHMP Public Outreach Meeting #2		TBD

Key:

- HMP = Local Hazard Mitigation Plan
- SE = Safety Element
- CO = Community Outreach

Attendee Sign-In Sheet

City of South Gate: LHMP and Safety Element Update

Kick-off Attendee Sign-In Sheet

Name	Department/Company	Telephone	Email
RICHARD J. LUNA	ADMINISTRATION DEPT.	323-563-9508	RJLUNA@SOGATE.ORG
Glenn Massey	Parks & Recreation	323 563-5448	gmassey@SOGATE.ORG
Jessica Jimenez	Community Development		jjimenez@SOGATE.ORG
Nick Bertuta	Fire	323-585-5857	nbertuta@fire.sogate.org
William Peraz	Public Works	(323) 357-9614	WPERAZ@SOGATE.ORG

Kick-off Attendee Sign-In Sheet

Name	Department/Company	Telephone	Email
SHERY KOOMEN	POLICE DEPT	323) 503-5483	skoomen@sogate
Rosemary Villaro	LACoFD	(213) 215-2193	rosemary.villaro@fire.lacounty.gov
Kim Sae	Finance Admin	(562) 999-2980	
Edward Perez	POLICE DEPT	(323) 864-7281	EPerez@sogate.org
Jim Teeple	POLICE DEPT.	(323) 563-5453	JTEEPLS@SOGATE.ORG
CHRIS CASTILLO	Public Works water	323-595-9627	ccast116@sogate.org

Kickoff Presentation

Michael Baker
INTERNATIONAL

We Make a Difference



City of South Gate Local Hazard Mitigation Plan & Safety Element Project Kickoff

Meeting Objectives

- Project Objective/Project Goals
- Hazard mitigation plan development overview
- Review engagement and outreach process
- Finalize critical facilities list
- Discuss past hazard events
- Review Work Plan and schedule

Project Goal and Objectives

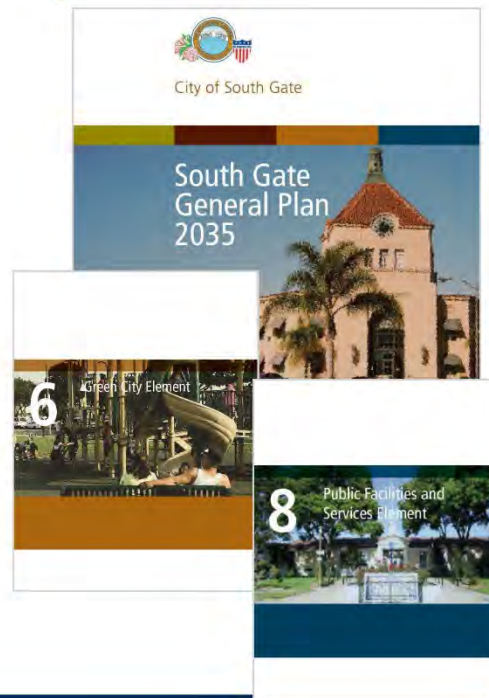


Enhance public safety through hazard mitigation and comprehensive planning

We Make a Difference

Safety Element Requirements and Opportunity

- The California Government Code requires a Safety Element (SE)
 - Must be part of the General Plan
 - Must address certain issues, including fire and flood hazards
- Integration of the LHMP with the SE qualifies jurisdictions for additional post-disaster funding



We Make a Difference

Goals for Hazard Mitigation Planning

We Make a Difference

LHMP Goals

- Encourage appropriate flood control and prevent negative impacts of new development on flood-control efforts (South Gate General Plan, Green City Element, Objective GC 4.1).
- Promote coordination between land-use planning and urban design, and law enforcement (South Gate General Plan, Public Facilities Element, Objective PF 1.2).
- Ensure that all new development includes adequate provision for fire safety (South Gate General Plan, Public Facilities Element, Objective PF 2.2).

LHMP Project Objectives

- Continued coordination with key stakeholders and other agencies.
 - Who are key stakeholders to contact?
- A flexible and engaging public outreach campaign.
 - What are the lessons learned from previous outreach events?
- Foster better communication and coordination within the City and surrounding areas.
 - What Cities/Agencies should be contacted regarding this project?
- Address aging infrastructure issues to reduce/minimize future hazards and disasters.
 - What infrastructure is at risk in your opinion?



Local Hazard Mitigation Plan (LHMP) Development

We Make a Difference

Plan Requirements – Hazard Identification and Risk Assessment

- Describe all hazards that affect the community.
- Provide rationale for excluding recognized hazards.



Plan Requirements – Hazard Identification and Risk Assessment

Vulnerability Assessment

- City's vulnerability to each hazard
- Potential impacts of each hazard (number and importance of affected structures and areas)
- Identifies repetitive loss properties
- Includes potential dollar losses

Plan Requirements – Mitigation Strategy

- **Goals**
- **Identification and analysis of mitigation actions**
 - Comprehensive
 - Focus on built environment
- **Action Plan**
 - Prioritizes actions
 - Describes implementation and administration
 - Includes cost-benefit review

Plan Requirements – Mitigation Strategy

- Strategy identifies existing authorities, policies, programs, and resources to mitigate hazards
- Includes description of participation in National Flood Insurance Program

Plan Requirements – Planning Process

- **Describe:**
 - How the plan was prepared
 - Who was involved
 - Opportunities for public and stakeholder involvement
 - Review and inclusion of existing plans, reports, studies, etc.
 - Continual public participation
 - Monitoring and updating of the plan
- **Stakeholders must include:**
 - Local and regional agencies involved in hazard mitigation
 - Agencies that regulate development
 - Neighborhood communities

LHMP Planning Team

- Agency representatives to advise and contribute to plan preparation
- Three LHMP Planning Team meetings:
 - Meeting 1 – Review and discuss hazard mitigation process, and identification and ranking of hazards
 - Meeting 2 – Review and discussion of the hazard profiles and risk assessment
 - Meeting 3 – Review and discussion of the draft mitigation actions

Plan Requirements – Planning Process LHMP Planning Team

- Administrative Services - Finance
- City Clerk
- City Manager
- Community Development
- Fire (Los Angeles County Fire Department)
- Parks & Recreation
- Police
- Public Works

Technical Advisory Committee (LHMP Planning Team)

- California Highway Patrol
- City of Cudahy
- City of Downey
- City of Huntington Park
- City of Lynwood
- City of Paramount
- County of Los Angeles Public Library – South Gate Branch, Leland R. Weaver Library
- Kuz Manufacturing (employer)
- Los Angeles County Regional Planning Office
- Los Angeles County Fire Department
- Los Angeles County Flood Control District
- Los Angeles Department of Water and Power
- Los Angeles Unified School District
- Water Boards
- Southern California Association of Governments
- Schultz Steel (employer)
- Southern California Edison
- South Gate Chamber of Commerce

Responsibilities

Our job

- Facilitate the process
- Provide technical expertise
- Do the heavy work

Your job

- Participate
- Make final decisions
- Ensure plan is feasible and meets needs
- Groundtruthing the plan

We Make a Difference

Data Needs

- Every person can provide vital data
 - GIS data
 - Information and experience about past events
 - Institutional knowledge
- If you have useful data, please contact *Alvie Betancourt*
(323) 563-9526
abetancourt@sogate.org



Engagement and Outreach

We Make a Difference

Public Outreach Strategy

Outreach Options

Original Proposal	Option 1	Option 2
Online Survey	2 PMC staff @ 1 community event	PMC Project Manager @ 1 traditional workshop
Two public workshops	Outreach training for City staff	1 PMC staff member @ 1 community event
	1,000 ½ page, color project flyers and booth materials	Reduced quantity of ½ page, color project flyers and booth materials
	Press release	
	1 project PPT and talking points for additional City staff outreach	



Critical Facilities

We Make a Difference

Critical Facilities, Part I

- **City Facilities**
 - City of South Gate City Hall
 - Parks & Recreation - Administration
 - Parks & Recreation - South Gate Girls Clubhouse
 - Parks & Recreation - South Gate Golf Course
 - Parks & Recreation - South Gate Senior Center
- Parks & Recreation - South Gate Sports Center
- Parks & Recreation - South Gate Swim Stadium
- Parks & Recreation - Hollydale Community Resource Center
- Parks & Recreation - Westside Community Resource Center
- Police Information Center

Critical Facilities, Part II

- **County Facilities**
 - L.A. County Fire Station #57
 - South Gate Senior High School
 - Odyssey Continuation School
 - Faith Christian Academy
 - Academia Betel
 - South Gate Middle School
 - State Street Elementary School
 - Victoria Avenue Elementary School
 - Stanford Avenue Elementary School
 - San Miguel Elementary School
 - Liberty Boulevard Elementary School
 - Hollydale Elementary School
 - Bryson Avenue Elementary School
 - San Gabriel Avenue Elementary School
 - Independent Elementary School
 - St. Helen Elementary School
 - Redeemer Lutheran School
 - Lollypop Lane Pre-School and Kindergarten

Hazard Identification and Prioritization

We Make a Difference

FEMA-Suggested Hazards

Avalanche	Flood	Seismic hazards
Climate change	Geological hazards	Severe winter storm
Coastal erosion	Hailstorm	Tornado
Coastal storm	Hazardous materials	Tsunami
Dam failure	Human-caused hazards	Volcano
Disease/pest management	Hurricane	Wildfire
Drought	Land subsidence	Wind
Earthquake fault rupture	Landslide and mudflow	Windstorm
Expansive soils	Liquefaction	
Extreme heat	Sea level rise	

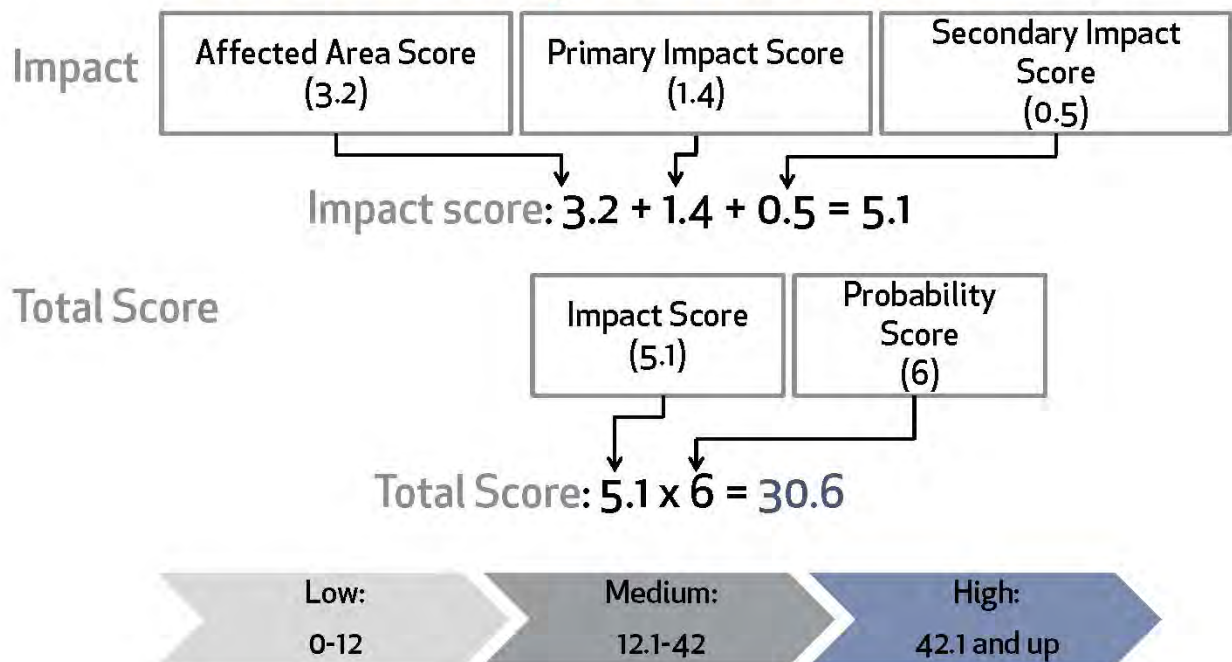
Relevant Hazards

Avalanche	Flood	Seismic hazards
Climate change	Geological hazards	Severe winter storm
Coastal erosion	Hailstorm	Tornado
Communicable diseases	Hazardous materials	Toxic substances
Dam failure	Human-caused hazards	Volcano
Disease/pest management	Intentional terrorism	Wildfire
Drought	Land subsidence	Wind
Earthquake fault rupture	Landslide and mudflow	Windstorm
Expansive soils	Liquefaction	
Extreme heat	Sea level rise	

Hazard Prioritization

- **Four criteria [Weightings]**
 - Probability (likelihood of occurrence) [2.0]
 - Location (size of potentially affected area) [0.8]
 - Maximum Probable Extent (intensity of damage) [0.7]
 - Secondary Impacts (severity of impacts to community) [0.5]
- **A value of 1-4 is assigned for each criteria**
- **Every criteria has an Importance Score**
 - Can be used to weigh the influence of an individual criterion
 - Criteria and Importance values are combined to calculate a Total Score

Score Example: Windstorm



Timeline

Task	Timeframe
Kick-off meeting	July 14, 2015
Data Collection, Hazards Profiles, and Risk Assessment	July - August 2015
Initiate LHMP Planning Team and Public Outreach	August 2015
SE Policy Framework	August - September 2015
Draft LHMP complete	October 2015
Draft SE and CEQA documents complete	November 2015
Public Review Draft LHMP, SE, CEQA documents complete	November - December 2015
Draft LHMP submitted to FEMA	January 2016
FEMA review	To be determined
City Council adoption	By April 2016, following FEMA review

Questions/Comments?

Alvie: abetancourt@sogate.org
Aaron: apfannenstiel@mbakerintl.com
Chris: cread@mbakerintl.com

Meeting Materials

South Gate Local Hazard Mitigation Plan and Safety Element Update Project Management Team

Meeting 1: August 12, 2015

Included Materials:

- Meeting agenda
- Preliminary Goals of the Project
- LHMP Stakeholders
- Critical Facilities
- Public Outreach Strategy
- Sign-In Sheet
- Presentation

City of South Gate

Local Hazard Mitigation Plan and Safety Element Update

LHMP Meeting #1

Wednesday August 12th, 1:00 – 3:00 p.m.

South Gate City Hall, 8650 California Ave

Agenda

1. Introductions (5 minutes)
2. Preliminary Project Goals (10 minutes)
3. Review LHMP Stakeholders (5 minutes)
4. Review Critical Facilities (10 minutes)
5. Review Public Outreach Strategy (10 minutes)
6. Review Hazard Profiles Information (30 minutes)
7. Hazard Prioritization Exercise (30 minutes)
8. Next Steps

Preliminary Goals of the Project

1. Encourage appropriate flood control and prevent negative impacts of new development on flood-control efforts (South Gate General Plan, Green City Element, Objective GC 4.1).
2. Promote coordination between land-use planning and urban design, and law enforcement (South Gate General Plan, Public Facilities Element, Objective PF 1.2).
3. Ensure that all new development includes adequate provision for fire safety (South Gate General Plan, Public Facilities Element, Objective PF 2.2).

LHMP Stakeholders

1. City of Bell Gardens
2. City of Cudahy
3. City of Downey
4. City of Huntington Park
5. City of Los Angeles - Council District Representative
6. City of Lynwood
7. City of Paramount
8. County of Los Angeles Public Library (Administrative Office)
9. East LA Community College (Satellite Campus)
10. Golden State Water Company
11. Hollydale Library
12. Los Angeles County Fire Department
13. Los Angeles County Flood Control District
14. Los Angeles County Operational Area E
15. Los Angeles County Regional Planning (Westmont/West Athens)
16. Los Angeles County Supervisor Office (District 1)
17. Los Angeles Department of Water and Power
18. Los Angeles Unified School District
19. MTA
20. MWD
21. South Gate Chamber of Commerce
22. Southeast Area Animal Control Authority (SEAACA)
23. Southern California Association of Governments
24. Southern California Edison
25. Southern California Gas Company
26. Tweedy Mile Association (TMA)
27. Walnut Mutual Water
28. Waste Management

Critical Facilities

	Facility	Address
City Facilities	City of South Gate City Hall	8650 California Avenue
	Public Works Corporate Yard	4244 Santa Ana Street
	Parks & Recreation - Administration	4900 Southern Avenue
	Parks & Recreation - South Gate Girls Clubhouse	4940 Southern Avenue
	Parks & Recreation - South Gate Golf Course	9615 Pinehurst Avenue
	Parks & Recreation - South Gate Senior Center	4855 Tweedy Boulevard
	Parks & Recreation - South Gate Sports Center	9520 Hildreth Avenue
	Parks & Recreation - Hollydale Community Resource Center	12221 Industrial Avenue
	Parks & Recreation - Westside Community Resource Center	9200 State Street
County Facilities	LA County Fire Station #54	4867 Southern Pl
	L.A. County Fire Station #57	5720 Gardendale Avenue
Other Facilities	High Tension Power Lines	
	Water Infrastructure (Well Sites and Reservoirs)	Confidential
Schools	Bryson Avenue Elementary School	4470 Missouri Avenue, South Gate, CA 90280
	Hollydale School	5511 Century Boulevard, South Gate, CA 90280
	Independence Elementary School	8435 Victoria Avenue, South Gate, CA 90280
	Liberty Boulevard Elementary School	2728 Liberty Boulevard, South Gate, CA 90280
	Madison Elementary School	9820 Madison Avenue, South Gate, CA 90280
	Montara Avenue Elementary School	10018 Montara Avenue, South Gate, CA 90280
	San Gabriel Avenue Elementary School	8628 San Gabriel Avenue, South Gate, CA 90280
	San Miguel Elementary School	9801 San Miguel Avenue, South Gate, CA 90280
	South Gate Community Adult School	2525 Firestone Boulevard, South Gate, CA 90280
	Stanford Avenue Elementary School	2833 Illinois Avenue, South Gate, CA 90280
	Stanford Primary Center School	3020 Kansas Avenue, South Gate, CA 90280

	State Street Elementary School	3211 Santa Ana Street, South Gate, CA 90280
	Tweedy Elementary School	9724 Pinehurst Avenue, South Gate, CA 90280
	Victoria Avenue Elementary School	3320 Missouri Avenue, South Gate, CA 90280
	South Gate Middle School	4100 Firestone Boulevard, South Gate, CA 90280
	Southeast Middle School	2560 Tweedy Boulevard, South Gate, CA 90280
	Odyssey Continuation School	8693 Dearborn Avenue, South Gate, CA 90280
	South East High School	2720 Tweedy Boulevard, South Gate, CA 90280
	South Gate Senior High School	3351 Firestone Boulevard, South Gate, CA 90280
	International Studies Learning Center School	2701 Sequoia Drive, South Gate, CA 90280
	Saint Helen School	9329 Madison Ave, South Gate, CA
	Redeemer Lutheran Church & School	2626 Liberty Blvd, South Gate, CA
	South Gate Montessori Preschool	10108 California Ave, South Gate, CA
	Aspire Firestone Academy	8929 Kauffman Ave, South Gate, CA 90280
	Willow Elementary	2777 Willow Place, South Gate, CA 90280
	Valiente Elementary College Prep	8691 California Ave, South Gate, CA 90280
	Soledad Charter School	3616 Missouri Ave, South Gate, CA 90280
	Kid's Forum	4513 Tweedy Boulevard, South Gate, CA 90280
	Great Commission Baptist School	8420 South Gate Avenue, South Gate, CA 90280
	Kiddie Crest Academy	13067 Paramount Blvd, South Gate, CA 90280
	Pilgrim Baptist Academy	2702 Glenwood Pl, South Gate, CA 90280
	Legacy High School	5225 Tweedy Blvd, South Gate, CA 90280

Public Outreach Strategy

- Disseminate information via a website page, through the City's quarterly newsletter, flyers in City water bill, and email distribution.
- Develop an email distribution list from existing sources and allow members to opt in to this process.
- Allow opportunities for new stakeholders to opt in via the website.
- Distribute an online survey to gather feedback from potential stakeholders.
- Conduct one community workshop to review hazards information and the hazard mitigation planning process with community members.

Attendee Sign-In Sheet

Name	Department/Company	Telephone	Email
Richard J. Luna	Administration Department	323-563-9508	rjluna@sogate.org
Glenn Massey	Parks and Recreation Department	323-563-5448	gmassey@sogate.org
Jessica Jimenez	Community Development Department		jjimenez@sogate.org
Nick Berkuta	LA County Fire	323-585-5857	nberkuta@fire.lacounty.gov
Guillermo Petra	Public Works	323-357-9614	gpetra@sogate.org
Sheri Koomen	Police Department	323-563-5483	skoomen@sogate.org
Rosemary Vivero	LA County Fire Department	213-215-2193	Rosemary.vivero@fire.lacounty.gov
Kim Sao	Finance Department	562-999-2980	ksao@sogate.org
Edward Perez	Police Department	323-864-7281	eperez@sogate.org
Jim Teeples	Police Department	323-563-5453	jteeple@sogate.org
Chris Castillo	Public Works Water	323-595-9627	ccastillo@sogate.org
Alvie Betancourt	Community Development	323-563-9526	abetancourt@sogate.org

Meeting 1 Presentation

Michael Baker
INTERNATIONAL

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City of South Gate Local Hazard Mitigation Plan Meeting 1

Meeting Objectives

- Present draft hazard profiles
- Prioritize hazards
- Confirm additional data needs

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City of South Gate Hazard Profiles

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Hazard Profile Components

- Identification of the Hazard
- Profile of the Hazard
 - Location
 - Extent
- Past Occurrences
- Probability of Future Occurrences
- Climate Change Considerations
- Vulnerabilities/ Risk Assessment
- Utilities Considerations

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FEMA-Suggested Hazards

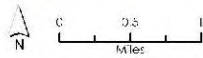
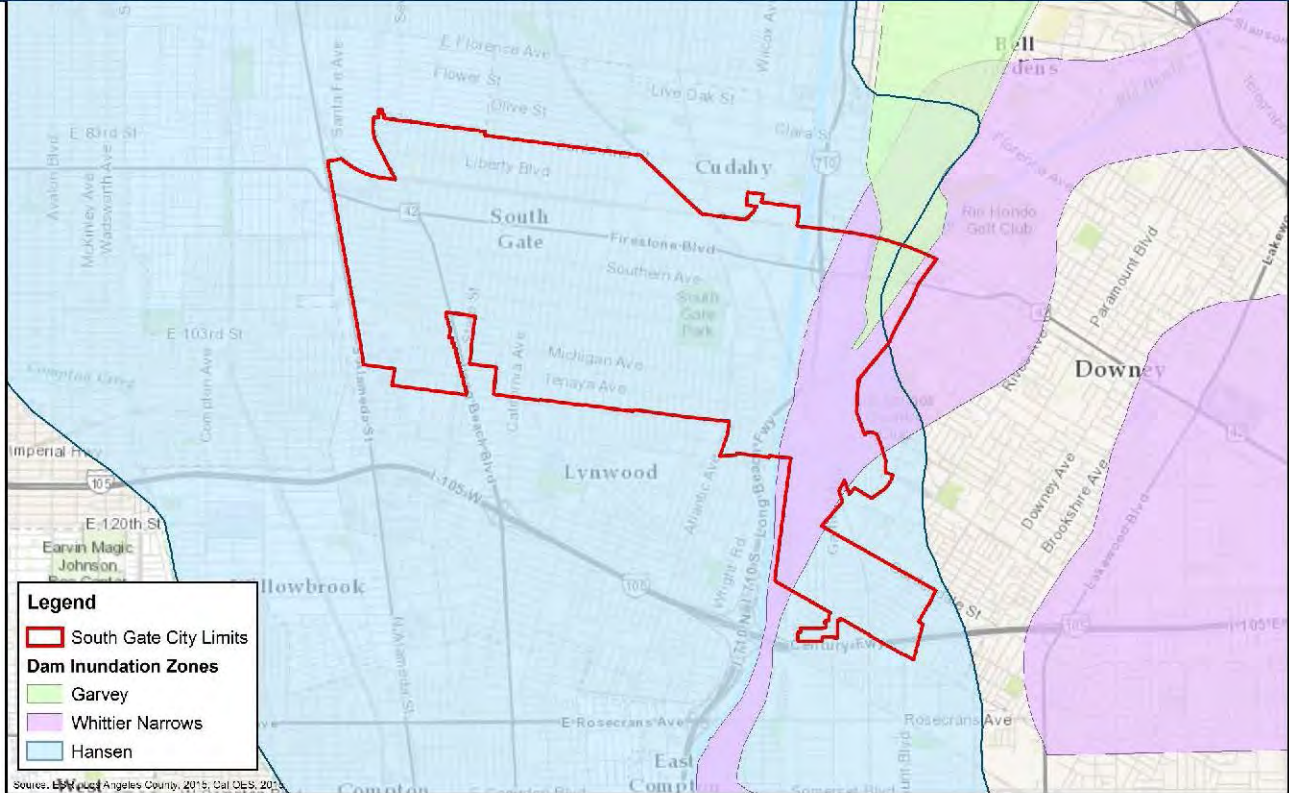
Avalanche	Flood	Seismic hazards
Climate change	Geological hazards	Severe winter storm
Coastal erosion	Hailstorm	Tornado
Coastal storm	Hazardous materials	Tsunami
Dam failure	Human-caused hazards	Volcano
Disease/pest management	Hurricane	Wildfire
Drought	Land subsidence	Wind
Earthquake fault rupture	Landslide and mudflow	Windstorm
Expansive soils	Liquefaction	
Extreme heat	Sea level rise	

South Gate – Identified Hazards

Dam failure	Extreme heat	Seismic hazards
Disease/pest management	Flood	Severe weather
Drought	Hazardous materials	

Dam Failure

- **Location and Extent**
 - The entire city (see dam inundation zones)
- **Past Occurrences**
 - Two dam failures occurred since 1900 (Southern California)
- **Probability of Future Occurrences**
 - Low, modern dams are highly unlikely to fail. However, extreme seismic shaking could cause dam failure.
- **Climate Change Considerations**
 - More frequent periods of intense precipitation, leading to a potential rise in flood events and increased vulnerability to steams/dams.



City of South Gate
Dam Inundation Zones



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Disease/Pest Management

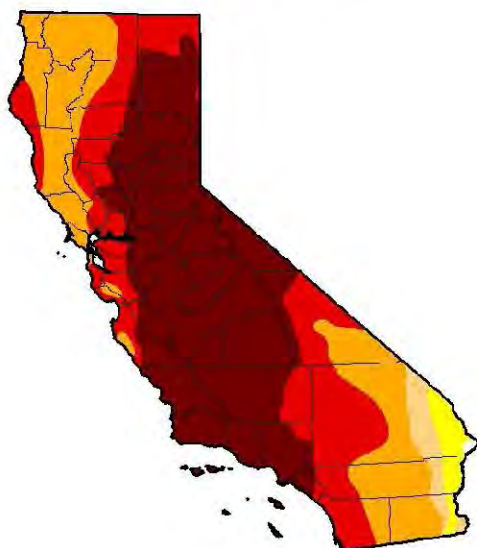
- Location and Extent
 - The entire City
- Past Occurrences
 - Data on West Nile currently unavailable; **data on diseased trees needed; other concerns?**
- Probability of Future Occurrences
 - Likely, especially as climate conditions change (see below)
- Climate Change Considerations
 - Climate change is expected to increase instances of West Nile Virus and diseased trees

Drought

- **Location and Extent**
 - The entire city
- **Past Occurrences**
 - 10 events since 1917, average three to five years in duration.
- **Probability of Future Occurrences**
 - High probability given the prevalence of drought throughout the state over the last 100 years.
- **Climate Change Considerations**
 - Anticipated changes in precipitation regimes may reduce groundwater levels within the City, further increasing risks to drought.

Drought

U.S. Drought Monitor California



July 28, 2015

(Released Thursday, Jul. 30, 2015)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	Ncne	D0 D4	D1 D4	D2 D4	D3 D4	D4
Current	0.14	99.86	97.35	94.56	71.03	46.00
Last Week 7/21/2015	0.14	99.86	97.35	94.56	71.03	46.00
3 Months Ago 4/28/2015	0.14	96.83	98.11	93.44	66.63	46.77
Start of Calendar Year 1/20/2014	0.30	100.00	98.12	94.34	77.84	32.21
Start of Water Year 9/20/2014	0.30	100.00	100.00	95.04	81.92	58.41
One Year Ago 7/28/2014	0.30	100.00	100.00	100.00	81.83	58.41

Intensity:

D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought
D2 Severe Drought	

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Richard Heim
NOBI/NOAA



<http://droughtmonitor.unl.edu/>

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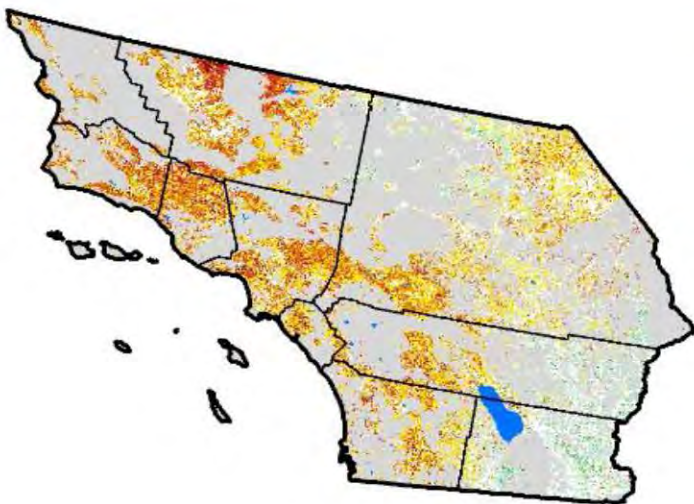
Drought

Vegetation Drought Response Index
Complete: California, Quad 4

July 27, 2015

Vegetation Condition

- Extreme Drought
- Severe Drought
- Moderate Drought
- Pre-Drought
- Near Normal
- Unusually Moist
- Very Moist
- Extremely Moist
- Out of Season
- Water



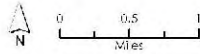
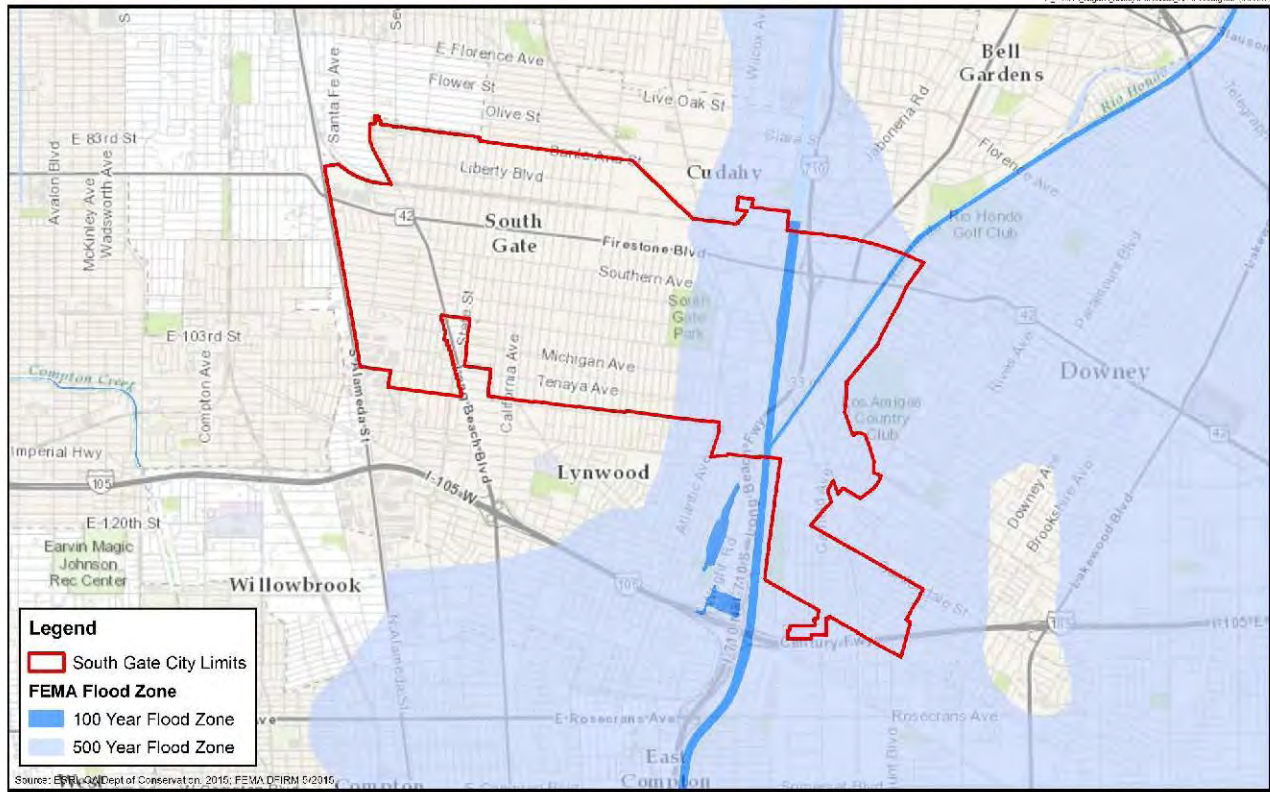
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Extreme Heat

- **Location and Extent**
 - The entire city
- **Past Occurrences**
 - On average 4 extreme heat days per year
 - On average 0-1 heat wave per year
- **Probability of Future Occurrences**
 - High certainty that extreme heat conditions will occur in the future.
- **Climate Change Considerations**
 - Future climate conditions could increase the number of extreme heat events.
 - 15-35 extreme heat days expected by 2050.

Flood

- **Location and Extent**
 - Nearly all of the city east of South Gate park located in 500-year floodplain. LA River and Rio Hondo identified as 100-year floodplain.
- **Past Occurrences**
 - From 1950 to 2012, Los Angeles County had 32 state and federally-declared flood disasters, the second highest of any county in the state **(local data needed)**.
- **Probability of Future Occurrences**
 - It is anticipated that urban flooding will continue to occur during wet winter storms.
- **Climate Change Considerations**
 - Increase storm intensity could increase urban flooding issues within the City.



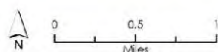
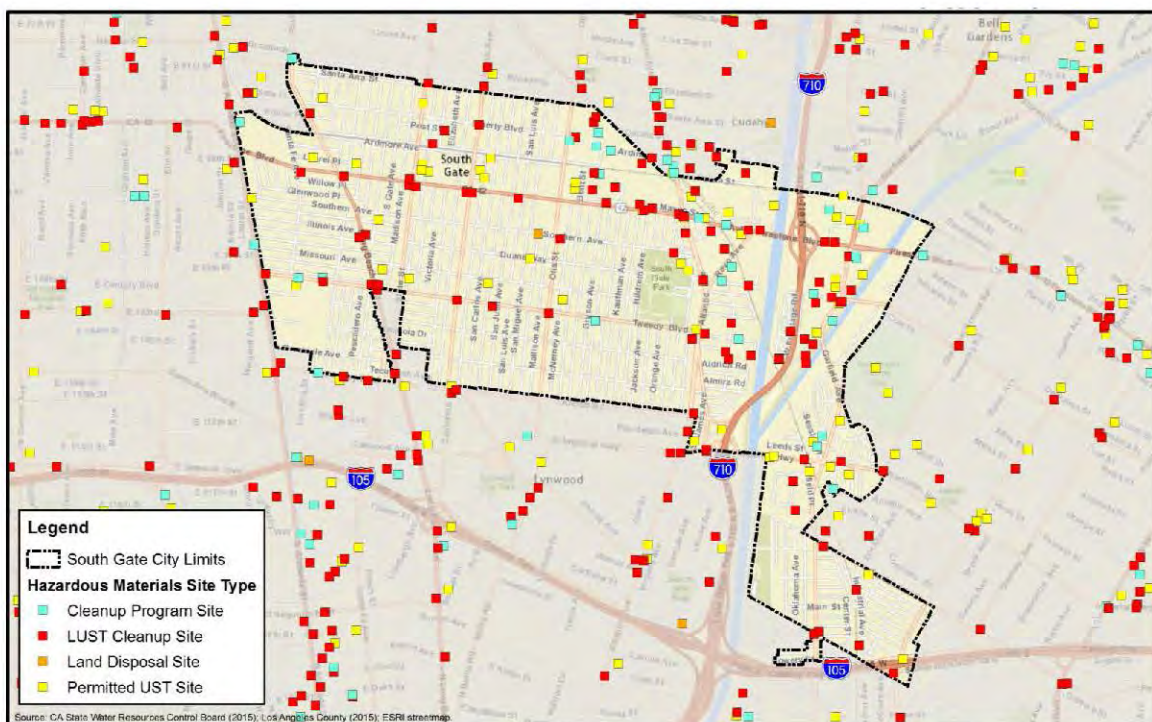
City of South Gate
Flood Hazards



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Hazardous Materials

- **Location and Extent**
 - Many places in the City currently store or have previously stored hazardous materials. Rail corridors likely carry hazardous materials through the City.
- **Past Occurrences**
 - No history of significant hazardous material-related emergency events in South Gate, although there have been a few substantial events in the vicinity. (confirm)
- **Probability of Future Occurrences**
 - Unknown
- **Climate Change Considerations**
 - Unknown

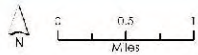
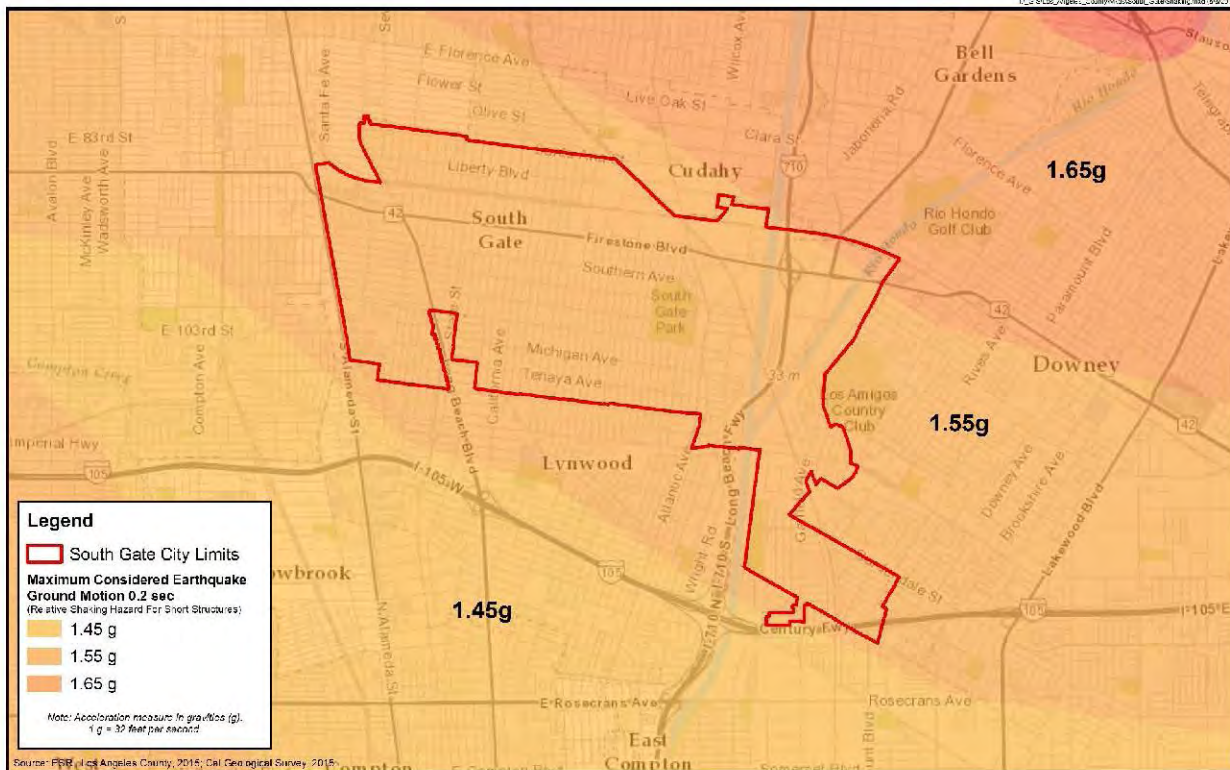


City of South Gate
Hazardous Materials Sites



Seismic Hazards

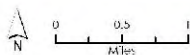
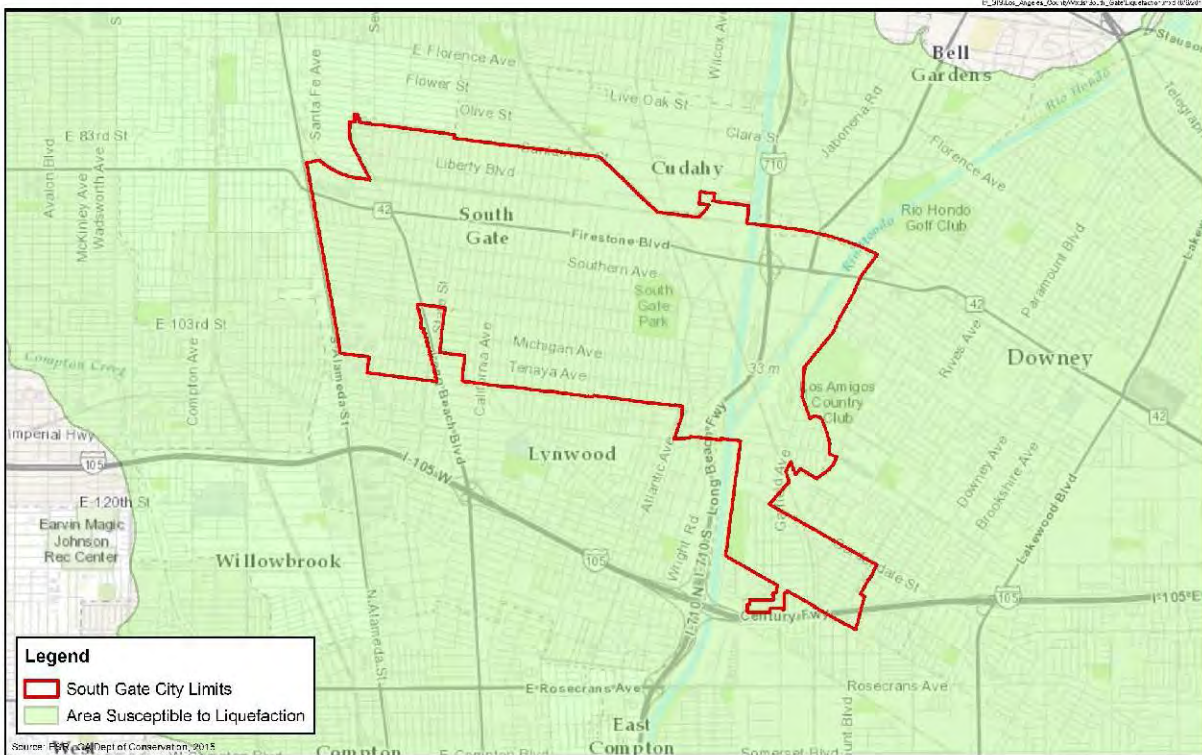
- Location and Extent
 - The entire city (for ground shaking and liquefaction)
- Past Occurrences
 - Multiple, including 1933, 1971, 1987, and 1994 earthquakes (**Local Damage?**)
- Probability of Future Occurrences
 - 100% chance of 6.0 or greater quake in Southern California by 2044 (75% of 7.0 or above)
- Climate Change Considerations
 - No effect on primary hazards
 - Potential but unknown effect on secondary hazards



City of South Gate
Seismic Shaking



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City of South Gate
Liquifaction



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Severe Weather

- **Location and Extent**
 - The entire city
- **Past Occurrences**
 - High wind events (e.g. Santa Anas) occur frequently
 - Hail and tornadoes are rare, but not unknown
- **Probability of Future Occurrences**
 - Likely, greater chance for severe wind events
- **Climate Change Considerations**
 - Unknown impact on severe wind events
 - Possible increase in severe storms (hail and/or tornadoes)



Hazard Prioritization

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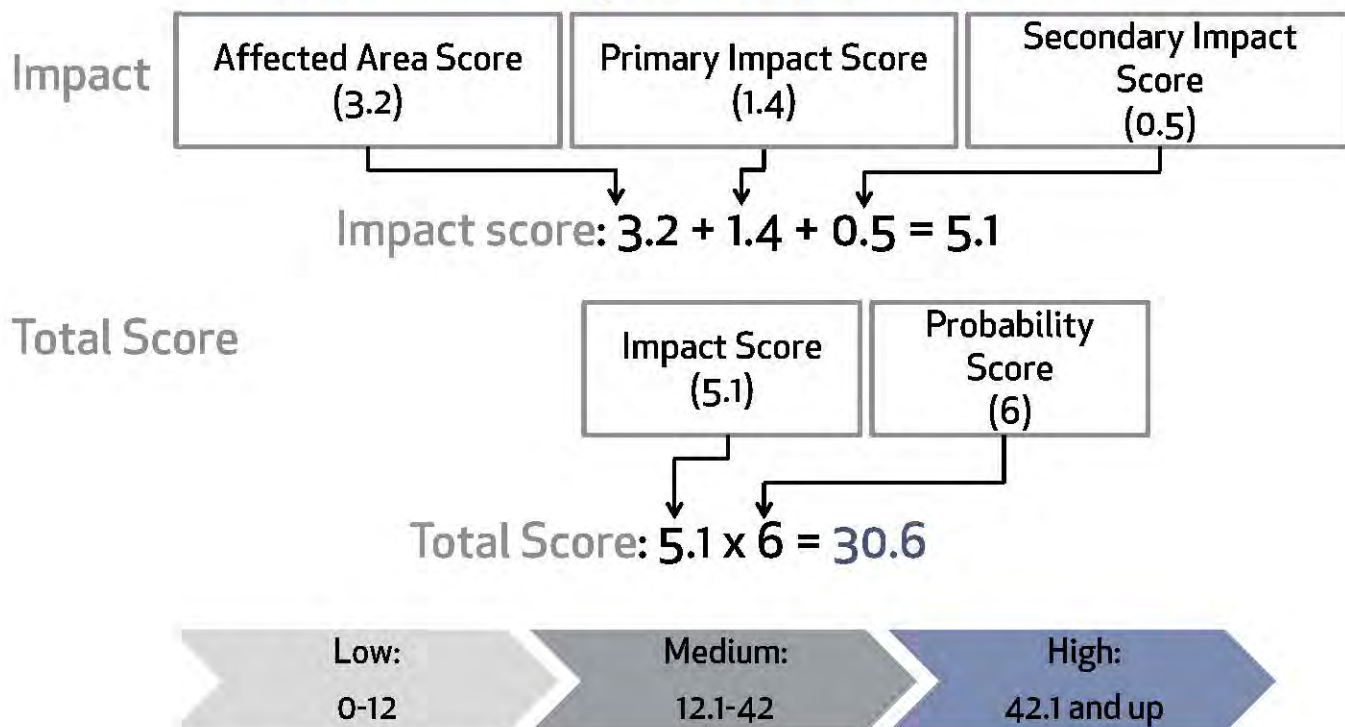
Hazard Prioritization

- **Four criteria [Weightings]**
 - Probability (likelihood of occurrence) [2.0]
 - Location (size of potentially affected area) [0.8]
 - Maximum Probable Extent (intensity of damage) [0.7]
 - Secondary Impacts (severity of impacts to community) [0.5]
- **A value of 1-4 is assigned for each criteria**
- **Every criteria has an Importance Score**
 - Can be used to weigh the influence of an individual criterion
 - Criteria and Importance values are combined to calculate a Total Score

Hazard Prioritization Example

- Four criteria [Weightings]
 - 3 Probability (likelihood of occurrence) [2.0]
 - 4 Location (size of potentially affected area) [0.8]
 - 2 Maximum Probable Extent (intensity of damage) [0.7]
 - 1 Secondary Impacts (severity of impacts to community) [0.5]

Score Example: Windstorm



Timeline

Task	Timeframe
Meeting #2	August 12, 2015
Data Collection, Hazards Profiles, and Risk Assessment	July - August 2015
Initiate Public Outreach	August 2015
SE Policy Framework	August - September 2015
Draft LHMP complete	October 2015
Draft SE and CEQA documents complete	November 2015
Public Review Draft LHMP, SE, CEQA documents complete	November - December 2015
Draft LHMP submitted to FEMA	January 2016
FEMA review	To be determined
City Council adoption	By April 2016, following FEMA review

Questions/Comments?

Alvie: abetancourt@sogate.org

Aaron: apfannenstiel@mbakerintl.com

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Meeting Materials

South Gate Local Hazard Mitigation Plan and Safety Element Update Project Management Team

Meeting 2: September 16, 2015

Included Materials:

- Mitigation Action Worksheet
- Sign-In Sheet
- Presentation

Hazard Issues and Mitigation Action Development

Hazard	Issues	Possible Mitigation Actions
Drought	<ul style="list-style-type: none"> •Water Supply: •Water Demand: •Water Quality: •Landscaping: •Other: •Other: •Other: 	
Seismic Hazards	<ul style="list-style-type: none"> •Vulnerable Public Structures: •Vulnerable Private Structures: •Awareness and Outreach: •Soil Studies / Building Code Compliance: •Other: •Other: •Other: 	
Extreme Heat	<ul style="list-style-type: none"> •Access to Cooling Centers: •Cost of Electricity: •Urban Forest: •Other: •Other: •Other: 	
Hazardous Materials	<ul style="list-style-type: none"> •Education and Awareness •Proximity to Train Lines •Sensitive Receptors •Other: •Other: 	

Hazard	Issues	Possible Mitigation Actions
Severe Weather	<ul style="list-style-type: none"> •Property Maintenance •Landscape and Tree Maintenance •Public Awareness •Other: •Other: 	
Flood	<ul style="list-style-type: none"> •Flood Infrastructure: •Stormwater: •Water Quality: •Non-Flood Zone Ponding: •Other: •Other: 	
Disease/Pest Management	<ul style="list-style-type: none"> •Diseased Trees •West Nile Virus •Other: •Other: 	
Dam Failure	<ul style="list-style-type: none"> •Evacuation Routes •Public Awareness and Education •Local Flood Control Infrastructure •Other: •Other: 	

Attendee Sign-In Sheet

Name	Department/Company	Telephone	Email
Richard J. Luna	Administration Department	323-563-9508	rjluna@sogate.org
Glenn Massey	Parks and Recreation Department	323-563-5448	gmassey@sogate.org
Jessica Jimenez	Community Development Department		jjimenez@sogate.org
Nick Berkuta	LA County Fire	323-585-5857	nberkuta@fire.lacounty.gov
Guillermo Petra	Public Works	323-357-9614	gpetra@sogate.org
Sheri Koomen	Police Department	323-563-5483	skoomen@sogate.org
Rosemary Vivero	LA County Fire Department	213-215-2193	Rosemary.vivero@fire.lacounty.gov
Kim Sao	Finance Department	562-999-2980	ksao@sogate.org
Edward Perez	Police Department	323-864-7281	eperez@sogate.org
Jim Teeples	Police Department	323-563-5453	jteeple@sogate.org
Chris Castillo	Public Works Water	323-595-9627	ccastillo@sogate.org
Alvie Betancourt	Community Development	323-563-9526	abetancourt@sogate.org

LHMP Meeting 2

Michael Baker
INTERNATIONAL

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City of South Gate Local Hazard Mitigation Plan Meeting 3

Meeting Objectives

- Confirm hazard prioritization
- Review draft risk assessment
- Discuss LHMP goals
- Develop initial mitigation actions



Hazard Prioritization Review

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Hazard Prioritization

- **Four criteria [Weightings]**
 - Probability (likelihood of occurrence) [2.0]
 - Location (size of potentially affected area) [0.8]
 - Maximum Probable Extent (intensity of damage) [0.7]
 - Secondary Impacts (severity of impacts to community) [0.5]
- **A value of 1-4 is assigned for each criteria**
- **Every criteria has an Importance Score**
 - Used to weight the influence of an individual criterion
 - Criteria and Importance values are combined to calculate a Total Score

Hazard Prioritization

Hazard Type	Probability	Impact			Total Score	Hazard Planning Consideration
		Location	Primary Impact	Secondary Impacts		
Drought	4	4	4	4	64.00	High
Seismic Hazards	4	4	4	4	64.00	High
Extreme Heat	4	4	3	2	50.40	High
Hazardous Materials	3	4	3	4	43.80	High
Severe Weather	3	4	3	4	43.80	High
Flood	3	2	3	4	34.20	Medium
Disease/Pest Management	4	2	1	2	26.40	Medium
Dam Failure	1	4	3	4	14.60	Medium

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Risk Assessment

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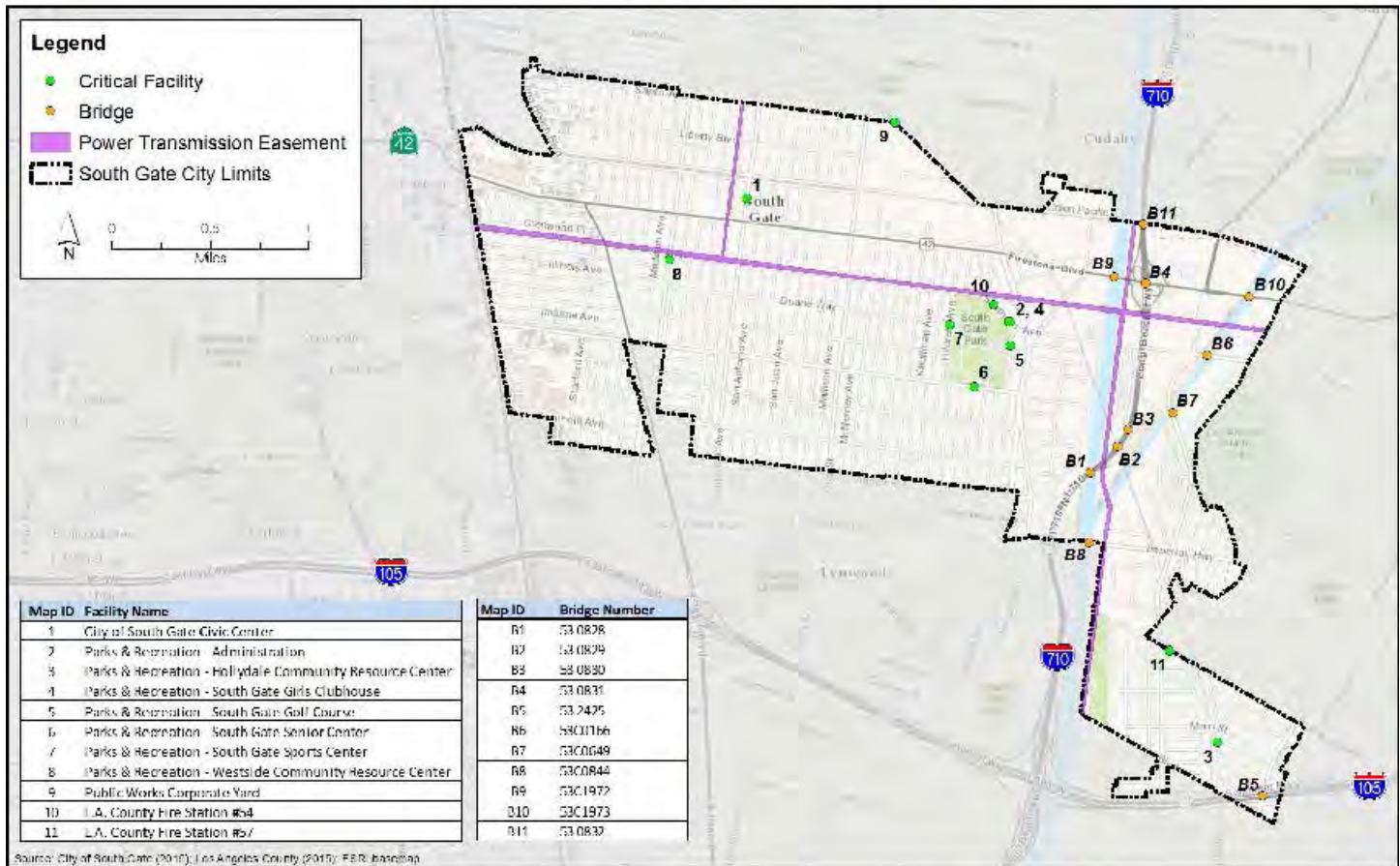
Risk Assessment Method

- Quantitative assessment of how each hazard affects the city.
- Identifies the following for each hazard area:
 - Population (based on an average population factor)
 - Land area (portion of city affected by hazard)
 - Critical facilities
 - Potential damage / loss estimations (based on building and content replacement values)

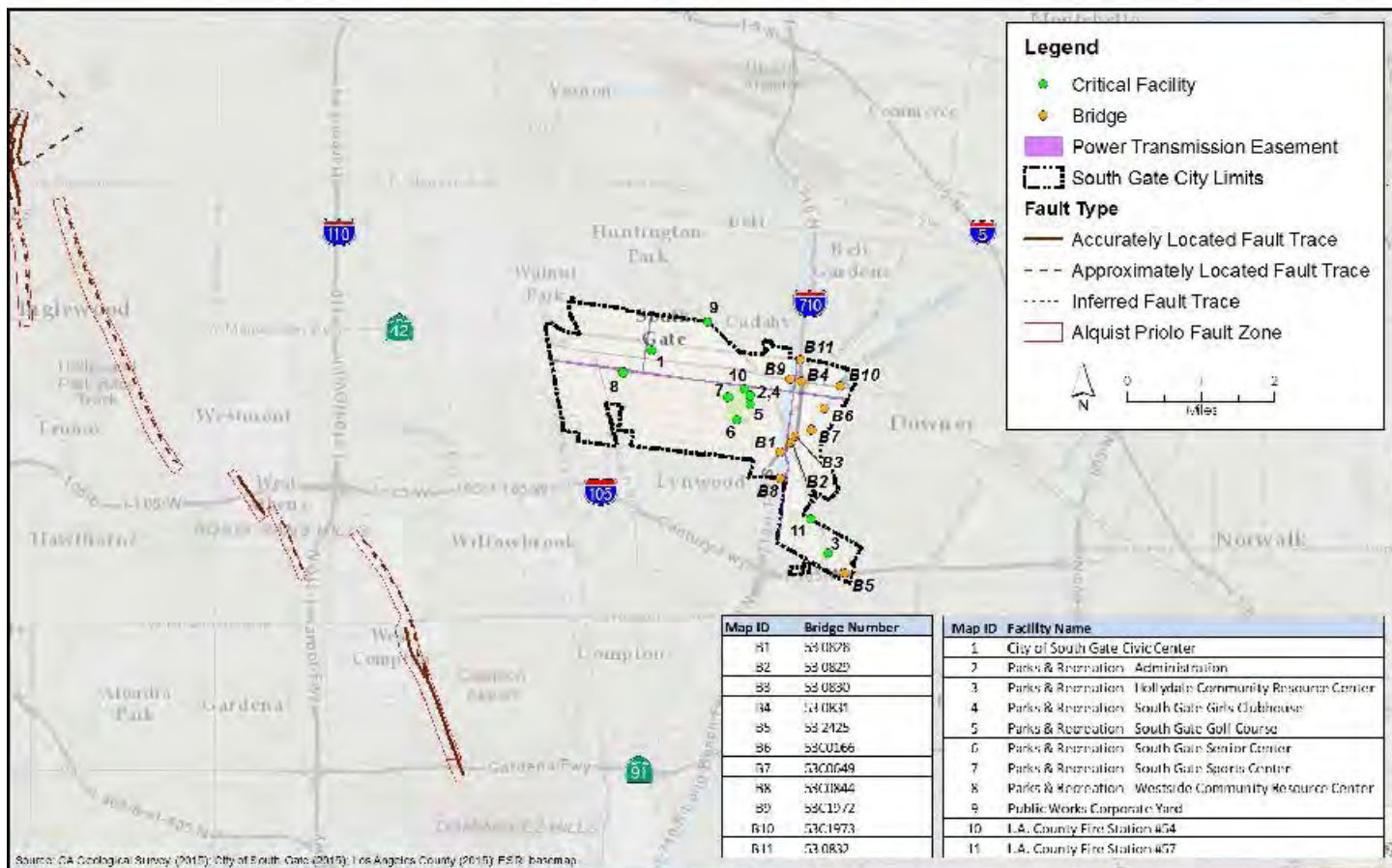
Note: An appendix will be added to the document that contains the Facilities of Concern (school sites). As part of the appendix, these facilities will qualitatively be assessed for risk.

Note: Confidential facility risk assessment information is provided under separate cover for City review.

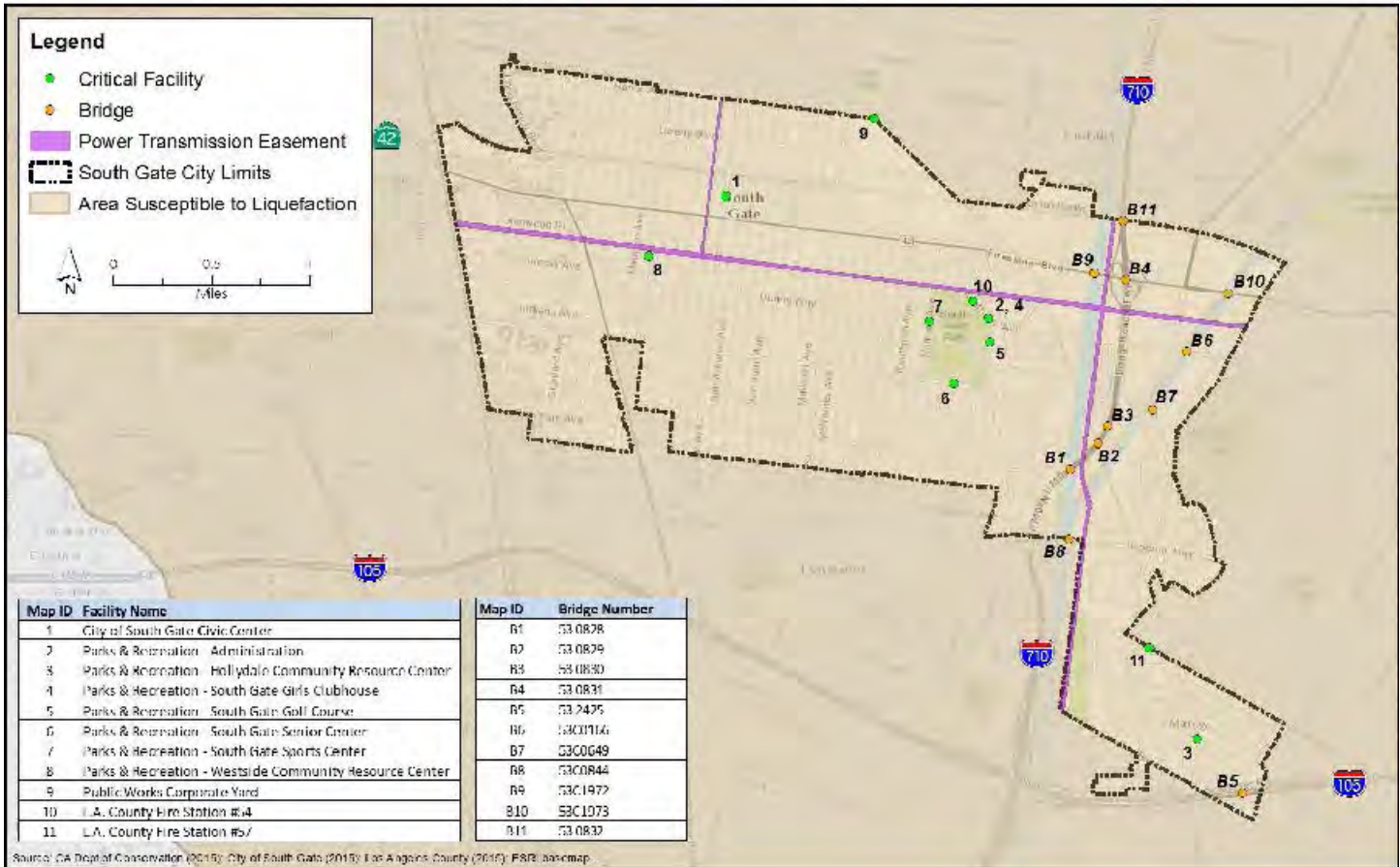
Critical Facilities



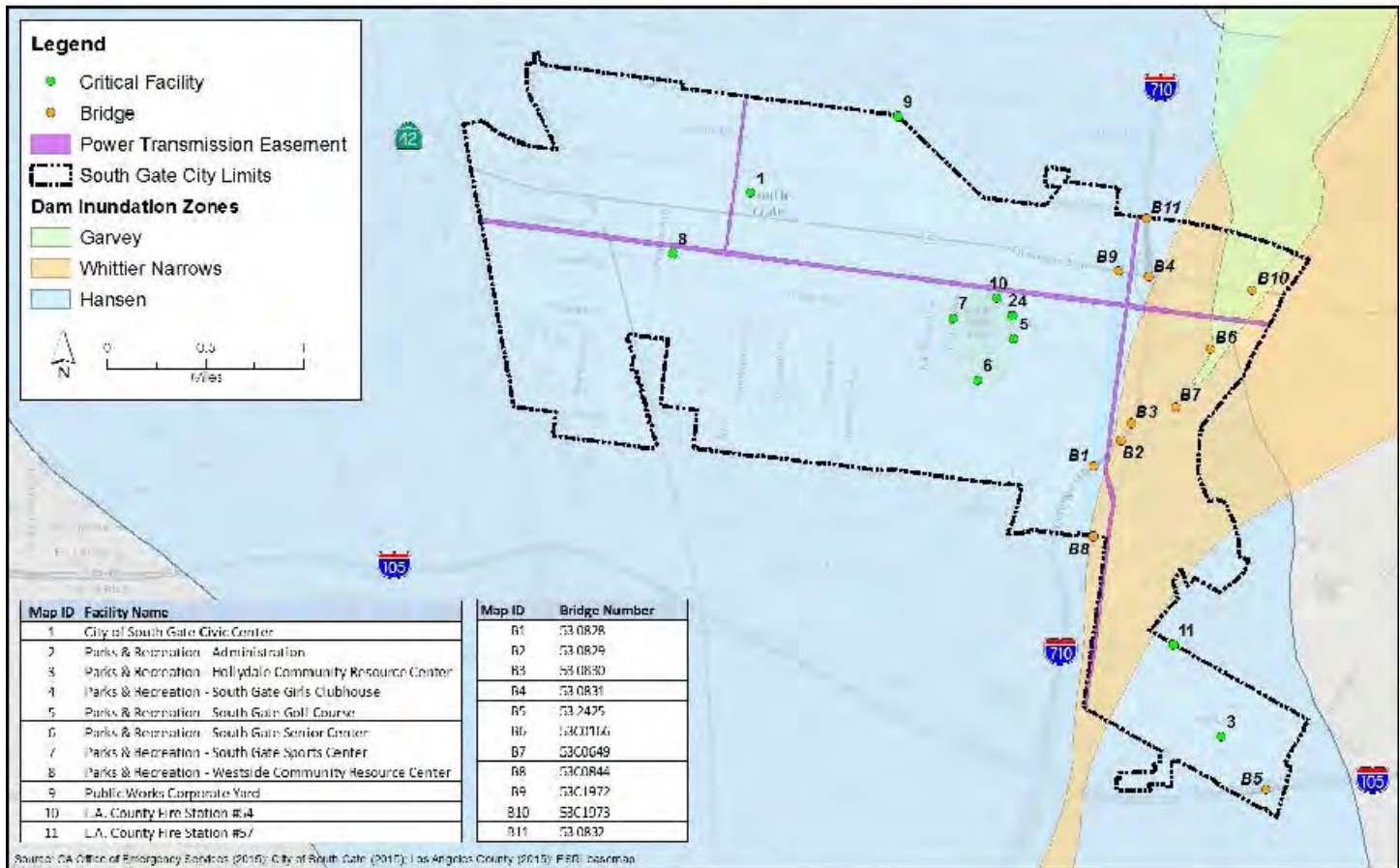
Seismic Hazards



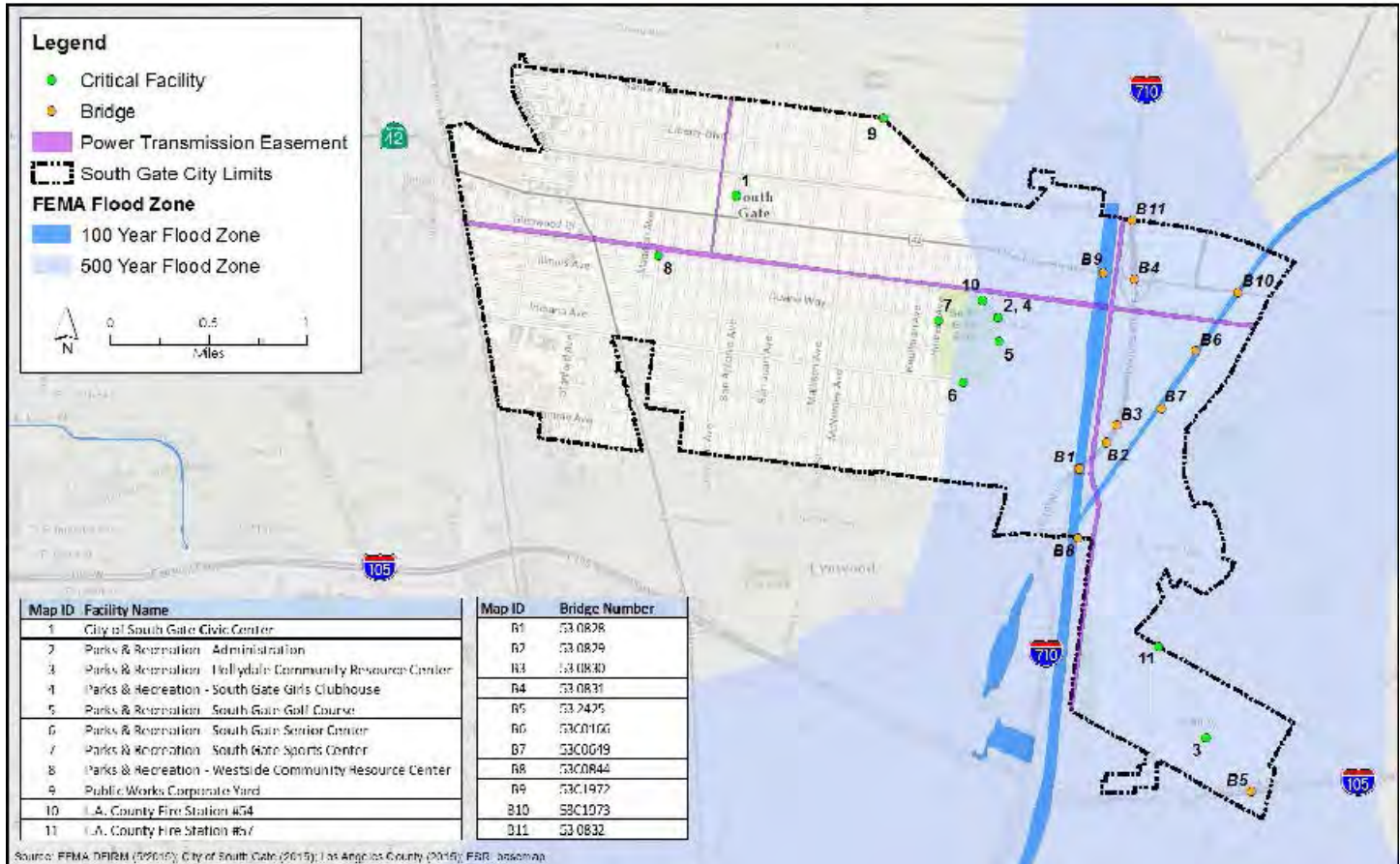
Liquefaction



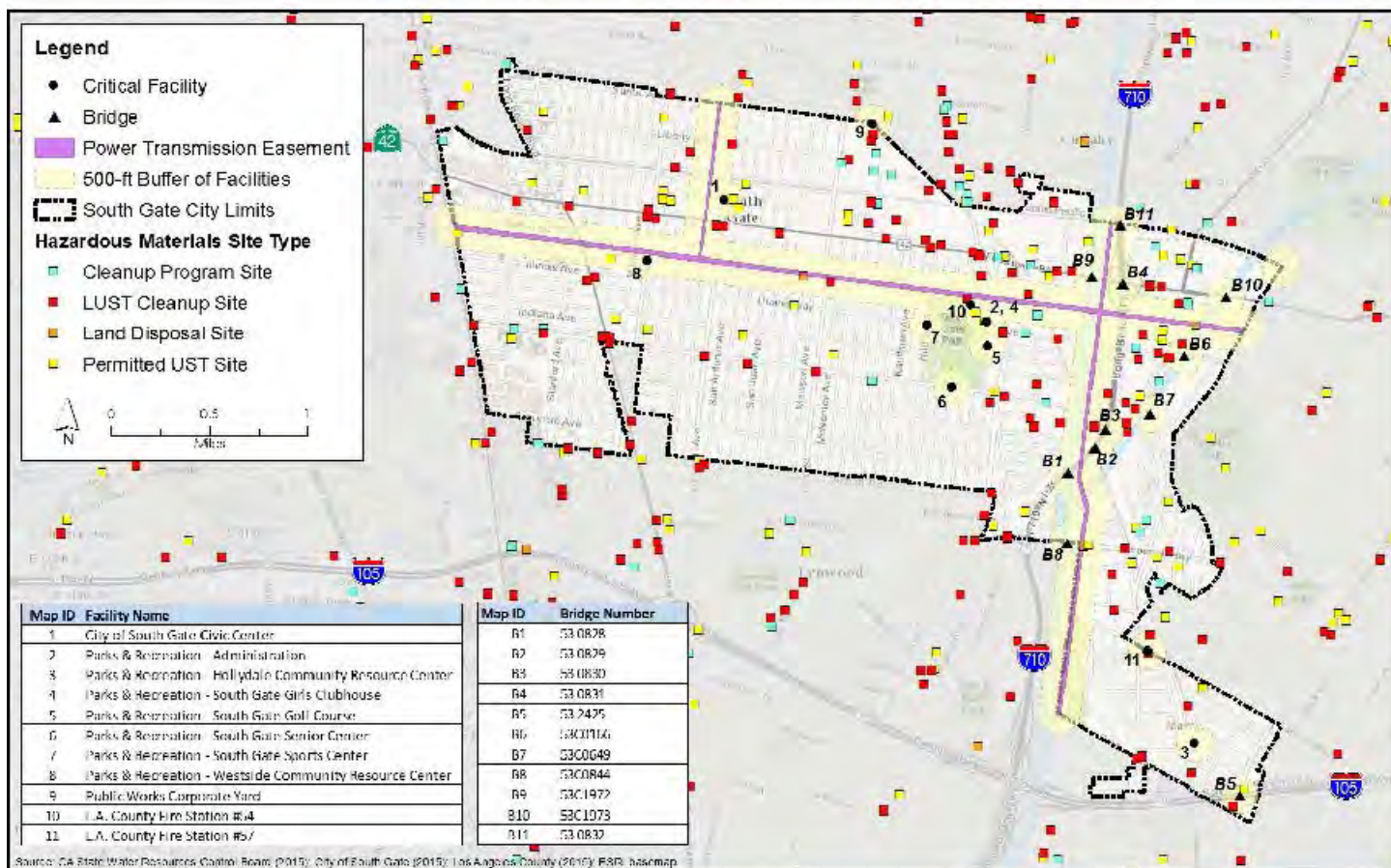
Dam Inundation



Flood Zones



Hazardous Materials



Risk Assessment Findings

Facility	Drought	Seismic Hazards	Extreme Heat	Hazardous Materials (500 ft of a hazardous material site)	Severe Weather	Flood (500 ft of 100 year floodplain)	Disease / Pest Management	Dam Failure
1 City of South Gate Civic Center	Y	Y	Y	Y	Y	N	Y	Y
2 Parks and Recreation - Administration	Y	Y	Y	Y	Y	N	Y	Y
3 Parks and Recreation - Hollydale Community Resource Center	Y	Y	Y	N	Y	N	Y	Y
4 Parks and Recreation - South Gate Girls Clubhouse	Y	Y	Y	Y	Y	N	Y	Y
5 Parks and Recreation - South Gate Golf Course	Y	Y	Y	N	Y	N	Y	Y
6 Parks and Recreation - South Gate Senior Center	Y	Y	Y	N	Y	N	Y	Y
7 Parks and Recreation - South Gate Sports Center	Y	Y	Y	N	Y	N	Y	Y
8 Parks and Recreation - Westside Community Resource Center	Y	Y	Y	N	Y	N	Y	Y
9 Public Works Corporate Yard	Y	Y	Y	Y	Y	N	Y	Y
10 L.A. County Fire Station #55	Y	Y	Y	Y	Y	N	Y	Y
11 L.A. County Fire Station #57	Y	Y	Y	Y	Y	N	Y	Y
Y denotes that the critical facility intersects the hazard layer				N denotes that the critical facility does not intersect the hazard layer				

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Risk Assessment Findings

	Drought	Seismic Hazards	Extreme Heat	Hazardous Materials	Severe Weather	Flood	Disease / Pest Management	Dam Failure
Total Populated Area Affected (Acres)								
Total Number of Residents Affected (% of City population)								
Total Number of Employees Affected (% of City workforce)								

Work in Progress

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Draft Mitigation Goals

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Mitigation Goals

- Will appear at the “goal” level in the Safety Element of the General Plan
- Provides a desired end state that occurs as a result of the plan
- Provides a framework to organize and identify hazard mitigation projects

Mitigation Goals

1. The built environment protects life and property from natural hazard impacts.
2. Municipal and emergency operations are fully functional during natural disasters.
3. Hazard mitigation partnerships exist within the community and throughout the region.
4. The public knows how hazards could affect their property and families.



Mitigation Action Working Session

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Mitigation Actions

The Plan must identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure (Code of Federal Regulations §201.6(c)(3)(ii)).

Sample Mitigation Organization

Mitigation Action	Responsible Department	Potential Funding Source(s)	Policy Integration Opportunities	Target Completion Date	Priority
1. Multiple Hazards-Related Actions					
1.1					
1.2					
2. Drought					
2.1					
2.2					
2.3					
Etc.					

Drought Issues

- Water Supply
- Water Demand
- Water Quality
- Landscaping
- Other:



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Seismic Hazard Issues

- Vulnerable Public Structures
- Vulnerable Private Structures
- Awareness and Outreach
- Soil Studies / Building Code Compliance
- Other:



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Extreme Heat Issues

- Access to Cooling Centers
- Cost of Electricity
- Urban Forest
- Other:



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Hazardous Materials Issues

- Education and Awareness
- Proximity to Train Lines
- Sensitive Receptors
- Other:

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Severe Weather Issues

- Property Maintenance
- Landscape and Tree Maintenance
- Public Awareness
- Other:



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Flood Issues

- Flood Infrastructure
- Stormwater
- Water Quality
- Non-Flood Zone Ponding
- Other:



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Disease / Pest Management Issues

- Diseased Trees
- West Nile Virus
- Other:



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Dam Failure Issues

- Evacuation Routes
- Public Awareness and Education
- Local Flood Control Infrastructure
- Other:

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Questions/Comments?

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Aaron: apfannenstiel@mbakerintl.com

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Meeting Materials

South Gate Local Hazard Mitigation Plan and Safety Element Update Project Management Team

Meeting 3: November 4, 2015

Included Materials:

- Draft Mitigation Actions
- StapleE Table
- Sign-In Sheet

Mitigation Goals

1. Enhanced protection of life and property from hazard impacts.
2. Municipal and emergency operations are fully functional during disasters.
3. Strengthened partnerships within the community and throughout the region that enhance hazard mitigation, preparation, response, and recovery capabilities.
4. Educated and empowered community members prepare for, mitigate, respond to, and recover from hazards that affect their family and property.

Mitigation Action	Priority
1. Multiple Hazards	
1.10 Adopt, implement, and actively enforce the current state building code.	
<i>Hazards mitigated: drought, seismic hazards, extreme heat, flood</i>	
1.2 Adopt a policy to avoid siting new critical public facilities and infrastructure in areas of elevated vulnerability to flooding and seismic hazards. If siting such facilities in areas of elevated vulnerability is unavoidable, design facilities to remain operable during emergency situations to the greatest extent feasible.	
<i>Hazards mitigated: seismic hazards, flood</i>	
1.3 Work with utility companies and non-city agencies, including Southern California Edison, Southern California Gas Company, Los Angeles Metro, and telecommunication providers, to harden infrastructure to be more resilient to hazard situations, helping to provide safe service during emergency situations and to quickly fix any service interruptions.	
<i>Hazards mitigated: seismic hazards, severe weather, flood</i>	
1.4 Expand participation in the NotifyMe program to notify the community in the event of an occurring or imminent hazardous situation, including a need to evacuate. The program should support all commonly spoken languages and can be advertised through multiple methods (door-to-door notifications, phone, television, radio, and online/social media). Coordinate with the Los Angeles County Operational Area for best practices and for consistency with notification systems for surrounding communities.	
<i>Hazards mitigated: drought, seismic hazards, extreme heat, hazardous materials, severe weather, flood, disease/pest management, dam failure</i>	

Mitigation Action	Priority
<p>1.5 Conduct a comprehensive and ongoing education campaign to improve awareness of hazard threats and ways to reduce risks. The campaign should include mailings, in-person workshops and events, and media notifications (television, radio, online/social media, etc.). The campaign should be designed to reach all members of the community, and should include materials in commonly spoken languages in the community, including English and Spanish.</p> <p><i>Hazards mitigated: drought, seismic hazards, extreme heat, hazardous materials, severe weather, flood, disease/pest management, dam failure</i></p>	
<p>1.6 Update and expand the City’s Street Tree Master Plan to cover the following topics:</p> <ul style="list-style-type: none"> • Attaining “Tree City USA” designation. • Tree maintenance including canopy and root maintenance with an emphasis on maintaining buffers between canopies and critical infrastructure. <ul style="list-style-type: none"> • Drought-tolerant and shade-providing tree palettes. • Tree vulnerability to high winds, with direction to replace vulnerable trees with more resilient species. <ul style="list-style-type: none"> • Mitigating tree pest and disease impacts. <ul style="list-style-type: none"> • Actions and funding sources expand the City’s shade tree stock. • Best practices for private property plant selection and tree maintenance. <p><i>Hazards mitigated: drought, extreme heat, severe weather</i></p>	
<p>1.7 Coordinate with LA County Public Works to designate Firestone Boulevard as an official County Disaster Route.</p> <p><i>Hazards mitigated: seismic hazards, hazardous materials, severe weather, flood, dam failure</i></p>	

Mitigation Action	Priority
1.8 Update all emergency-related planning documents every five years to ensure consistency with state and federal law, best practices, local conditions, and recent science. Integrate the hazards research findings and actions in this Local Hazard Mitigation Plan with all City emergency planning efforts and programs.	
<i>Hazards mitigated: drought, seismic hazards, extreme heat, hazardous materials, severe weather, flood, disease/pest management, dam failure</i>	
1.9 Monitor and pursue hazard mitigation funding opportunities.	
<i>Hazards mitigated: drought, seismic hazards, extreme heat, hazardous materials, severe weather, flood, disease/pest management, dam failure</i>	

2. Drought

2.1 Adopt and enforce the State Model Water Efficient Landscaping Ordinance.
2.2 Work with regional partners, including the Los Angeles Unified School District and the Central Basin Water District, to develop a recycled water master plan, with the intention of identifying financially feasible approaches to expanding recycled water infrastructure throughout the city.
2.3 Amend the Municipal Code to require that water fixtures in new buildings be more efficient than otherwise required by state law.

Mitigation Action	Priority
2.4 Construct additional water storage facilities.	
2.5 Identify and pursue alternative sources of water to support potential shortages of deliveries from the Metropolitan Water District.	
2.6 Work with the Golden State Water Company to help ensure a sufficient long-term supply of water to the southeast portion of the community.	
2.7 Offer reduced-cost or free water audits for residents and businesses.	
2.8 Publicize available rebates and other financial incentives for equipment that reduces water use.	
2.9 Amend the Municipal Code to require new nonresidential buildings in a recycled water service area to include dual plumbing for potable and nonpotable water sources.	
2.10 As part of discretionary review, encourage new residential buildings in a recycled water service area to include dual plumbing for potable and nonpotable water sources.	

Mitigation Action	Priority
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2.11 Continue retrofitting publicly landscaped areas with artificial turf or drought-tolerant landscaping.

2.12 Require Urban Water Management Plan updates to consider more severe and long-lasting drought scenarios.

3. Seismic Hazards

3.1 Conduct a seismic study for public buildings and infrastructure and retrofit facilities based on findings and available funding.

3.2 Conduct a seismically vulnerable private building inventory, with a focus on unreinforced masonry and “soft-story” buildings, and develop a prioritized list of recommended phasing for retrofits.

3.3 Adopt a phased ordinance for seismic retrofits to require existing unreinforced buildings to meet current seismic standards. Identify and secure to the extent possible funding to assist property owners with retrofit costs.

3.4 In coordination with state and regional agencies, conduct seismic evaluations of infrastructure owned by other agencies in the city, and identify funding sources to conduct seismic retrofits of vulnerable infrastructure.

Mitigation Action	Priority
3.5 Retrofit City-owned facilities and infrastructure, including water storage tanks, to increase resiliency to seismic hazards and to remain operable immediately after seismic events.	
4. Extreme Heat	
4.1 On public facilities, conduct energy-efficiency audits, retrofit buildings to increase efficiency, and install solar panels to reduce demand on the electrical grid (increasing its resiliency during heat waves) and to save money and generate municipal revenue.	
4.2 Encourage solar panels on new and existing developments by widely publicizing available incentives and financing options, working with local PACE providers to expand outreach to lower-income and non-English-speaking neighborhoods, and participating in programs to reduce the cost of solar panels for residents.	
4.3 Work with community groups to identify and secure funding to install energy-efficient air conditioner units for homes without AC access, particularly for homes of lower-income residents, the elderly, and persons with disabilities.	
4.4 Require new nonresidential and multifamily development to incorporate high-reflectivity roofing and surface materials, shade trees, shade structures, and/or other infrastructure features to reduce human exposure to extreme heat and to mitigate the urban heat island effect.	

Mitigation Action	Priority
-------------------	----------

4.5 Upon discretionary review for significant remodels, require owners of existing parking lots to install infrastructure features to increase shade and reduce the urban heat island effect.

4.6 Educate all outdoor City workers, including construction, landscaping, maintenance, and recreation staff, about the risks posed by extreme heat and how to reduce them.

4.7 Include extreme heat as a hazard in the City’s Emergency Operations Plan with clear guidelines to:

- Designate public buildings and other community facilities as cooling centers that are easily accessible by all residents in all parts of South Gate, including individuals with limited mobility.
 - Distribute information about cooling centers.
- Establish a temperature threshold as a minimum standard for opening and operating cooling centers.

5. Hazardous Materials

5.1 As part of the development review process, require all hazardous material storage tanks meet or exceed all required and recommended safety standards, including resiliency to natural hazards such as flooding and seismic hazards.

Mitigation Action	Priority
5.2 As part of the development review process, continue to require soil testing for hazardous materials prior to construction activity, and to deny permits if risks from any hazardous materials are not mitigated to a generally safe level.	
5.3 Review the zoning ordinance and map and amend allowed uses to prevent siting facilities which may manufacture, store, use, transport, or allow hazardous materials near residential areas or other sensitive uses.	
5.4 Consult with Union Pacific Railroad (UPRR) on potential land use issues and safety concerns associated with the railroad rights-of-way in the city. As part of the consultation, UPRR should provide the City with its emergency response and recovery plans for assets located in the city.	

6. Flooding

6.1 Monitor the effectiveness of current requirements for new developments to handle stormwater on-site, to the extent possible, through the use of permeable paving and other low-impact development strategies, and update the requirements as needed.
6.2 Provide educational materials to existing property owners about the benefits of installing low-impact development stormwater components.

Mitigation Action	Priority
6.3 Upgrade storm drain infrastructure in areas that frequently pond during strong rains.	
6.4 Retrofit public spaces to reduce stormwater runoff, including using permeable paving for sidewalks and parking lots.	
6.5 Continue to participate in the National Flood Insurance Program and maintain an effective and up-to-date Flood Plain Management Ordinance.	
6.6 Continue and expand the regular cleaning and maintenance of City storm drains to ensure they are functioning at full capacity.	
6.7 Continue requiring new development projects to reduce potential and existing flooding hazards as part of the development process.	
6.8 Analyze the flood potential associated with elevated reservoir failure in the community.	

Mitigation Action	Priority
7. Severe Weather	
7.1 Design future key infrastructure to withstand severe weather events beyond minimum code specifications.	
7.2 Monitor trees and other vegetation near power lines, and promptly inform utility companies if any vegetation may threaten power service during severe weather and/or requires trimming.	
8. Disease and Pest Management	
8.1 Coordinate with the Los Angeles County Department of Public Health to ensure South Gate residents have access to affordable flu vaccinations, and that community members are notified about the availability of flu vaccines.	
8.2 Work with the Greater Los Angeles County Vector Control District to implement pest management strategies to reduce health risks from disease vectors, to treat/reduce areas of standing water where mosquitoes may breed, and to support additional mosquito mitigation actions as needed.	
9. Dam Failure	
9.1 Work with the US Army Corps of Engineers and the Metropolitan Water District to support retrofit activities for dams that may pose an inundation risk for South Gate.	

Mitigation Actions Discussion

Mitigation actions are the steps the City will take over the next five years in reducing or preventing the risks and hazards identified within this Plan. As part of the development of this Plan, the City used the STAPLE/E Criteria to establish the proposed actions for review by the TAC.

STAPLE/E Review and Selection Criteria

Social
<ul style="list-style-type: none"> Is the proposed action socially acceptable to the jurisdiction and surrounding community? Are there equity issues involved that would mean that one segment of the jurisdiction and/or community is treated unfairly? Will the action cause social disruption?
Technical
<ul style="list-style-type: none"> Will the proposed action work? Will it create more problems than it solves? Does it solve a problem or only a symptom? Is it the most useful action in light of other jurisdiction goals?
Administrative
<ul style="list-style-type: none"> Can the jurisdiction implement the action? Is there someone to coordinate and lead the effort? Is there sufficient funding, staff, and technical support available? Are there ongoing administrative requirements that need to be met?
Political
<ul style="list-style-type: none"> Is the action politically acceptable? Is there public support both to implement and to maintain the project?
Legal
<ul style="list-style-type: none"> Is the jurisdiction authorized to implement the proposed action? Are there legal side effects? Could the activity be construed as a taking? Will the jurisdiction be liable for action or lack of action? Will the activity be challenged?
Economic
<ul style="list-style-type: none"> What are the costs and benefits of this action? Do the benefits exceed the costs? Are initial, maintenance, and administrative costs taken into account? Has funding been secured for the proposed action? <ul style="list-style-type: none"> If not, what are the potential funding sources (public, non-profit, and private)? How will this action affect the fiscal capability of the jurisdiction? What burden will this action place on the tax base or local economy? What are the budget and revenue effects of this activity? Does the action contribute to other jurisdiction goals? What benefits will the action provide?

STAPLE/E Review and Selection Criteria

Environmental

- How will the action affect the environment?
- Will the action need environmental regulatory approvals?
- Will it meet local and state regulatory requirements?
- Are endangered or threatened species likely to be affected?

Attendee Sign-In Sheet

Name	Department/Company	Telephone	Email
Richard J. Luna	Administration Department	323-563-9508	rjluna@sogate.org
Glenn Massey	Parks and Recreation Department	323-563-5448	gmassey@sogate.org
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Nick Berkuta	LA County Fire	323-585-5857	nberkuta@fire.lacounty.gov
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Alvie Betancourt	Community Development	323-563-9526	abetancourt@sogate.org

APPENDIX B – PUBLIC OUTREACH MATERIALS AND OUTCOMES

- 1. LHMP Public Outreach and Engagement Summary**
- 2. Webpages used for Public Outreach and Feedback**
- 3. Planning Commission Agenda Bill (Public Review Period)**

City of South Gate LHMP Public Engagement and Outreach Summary

The City of South Gate conducted several engagement and outreach efforts to introduce the Hazard Mitigation Plan and process to residents and businesses in the city. The following describes the efforts undertaken by South Gate during this process.

Community Event

South Gate hosted a booth at Family Day at South Gate Park on Saturday, October 24, 2015. Community members who visited the booth were able to complete the survey in person. At the booth, posters showed the impacts that various hazards would have on the City's critical infrastructure to raise hazard awareness among community members. The results of the in-person survey are included in the Online Survey section. At the event, 22 surveys were completed in Spanish and 45 were completed in English.

Online Survey

The City developed a separate website for the development of the LHMP (<http://southgatehmp.com/>), which provided an overview of the project, relevant project documents, invitations to upcoming public events, mailing list sign-up, contact information for City staff, and a link to the online survey. The survey, which was posted on September 8, 2015, was available in both Spanish and English. The response period was closed on January 11, 2016, with a total of 143 responses; however, not all questions were answered by all respondents. Below is a summary of the questions and results of the online questionnaire.

How safe is your home?

Are you ready for disasters? Your input is critical to the hazard planning process.

Please take a few minutes to fill out this survey and tell the City your thoughts on the safety of your community.

Take the hazards survey in English

¿Qué tan segura es su casa?

¿Está listo(a) para desastres? Su aporte es crítico para el proceso de planificación sobre peligros.

Por favor tome unos minutos para llenar esta encuesta y decirle a la Ciudad sus pensamientos sobre la seguridad de su comunidad.

Tome la encuesta sobre los peligros en Español

Existing and Potential Hazards

Community members were asked about hazards that had already impacted their homes, as well as which potential hazards were of the most concern to them. Over 90 percent of community members had not been impacted by a disaster at their current residence. Of the nearly 10 percent that had been impacted, earthquakes, diseases or pests, and

extreme heat were the most common hazards. Earthquakes, diseases or pests, and drought were the three potential hazards that caused the most concern for community members. The potential of dam failure was of lowest concern to participants.

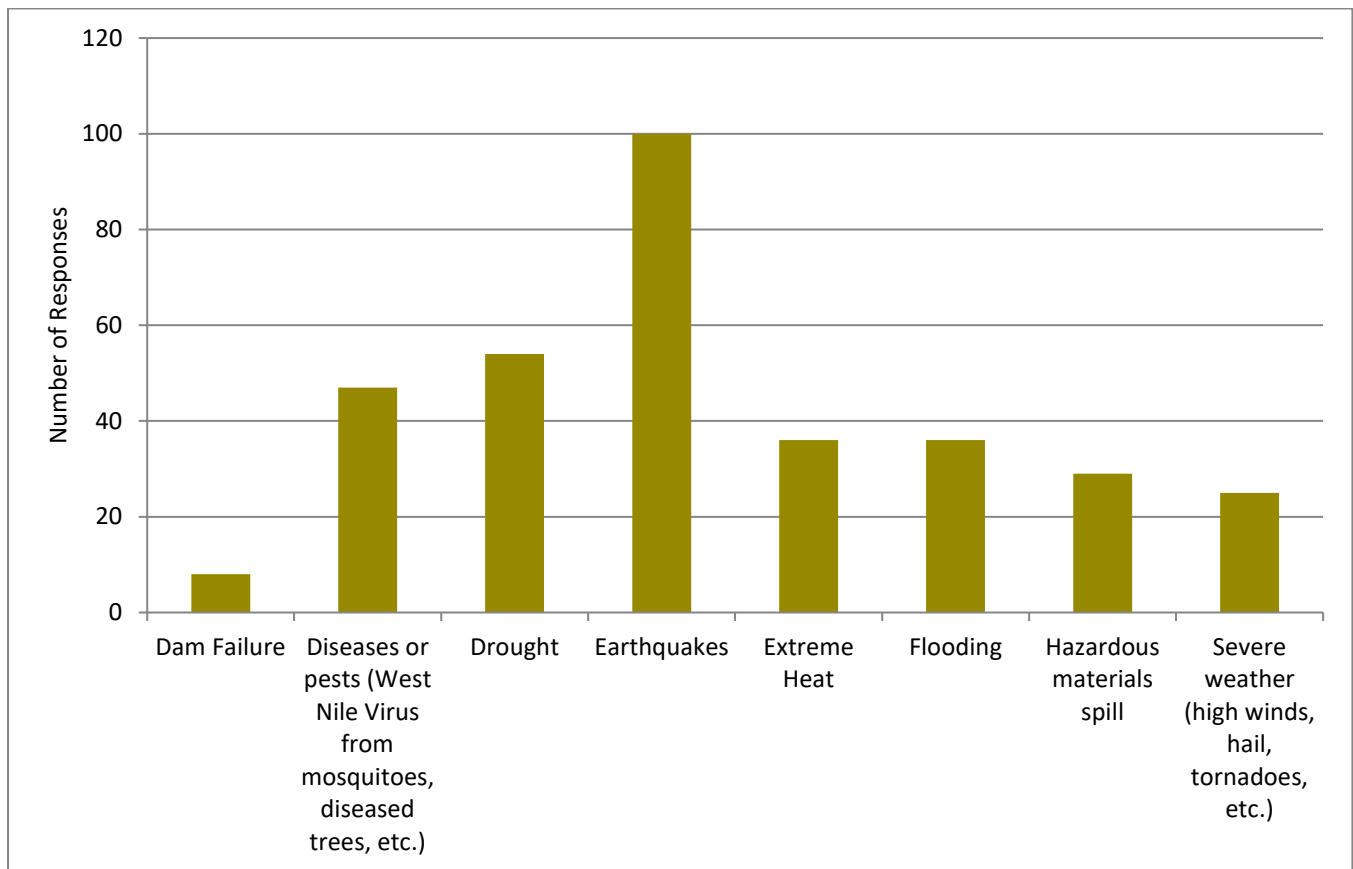
Table B-1. "Have you been impacted by a disaster in your current residence?"

	Total	Percent
Yes	11	9%
No	106	91%

Table B-2. "Select the disasters that you have been impacted by in your current residence"

	Total Reported Impacts
Diseases or pests (West Nile virus from mosquitoes, diseased trees, etc.)	3
Drought	2
Earthquakes	6
Extreme Heat	3
Flooding	2

Figure B-1. Hazards of most concern to your neighborhood



Personal Preparedness

In addition to identifying hazards of concern, participants were asked to explain individual steps they have taken toward increasing their individual preparedness for disaster. This understanding, while limited to the survey sample, can indicate the ability of the community to respond and recover from disaster. When asked about homeowners insurance, nearly 50 percent felt that their insurance was adequate to cover the hazards that could impact their home. Of community members who rented their homes, over three-fourths did not have renters insurance. While 24 percent of renters and homeowners surveyed had flood insurance, over 75 percent did not. Nearly half of the City is located within the 500-year flood zone, meaning that there is a 2 percent chance of a large flood occurring in that area each year.

Table B-3. "If you are a homeowner, do you have adequate homeowners insurance to cover the hazards that could impact your home?"

	Total	Percentage
Yes, my insurance coverage should be adequate.	44	47%
No, I don't believe my insurance coverage would be adequate for a major disaster.	15	16%
Unsure.	28	30%
I do not have an insurance policy.	7	7%

Table B-4. "If you rent your residence, do you have renters insurance?"

	Total	Percent
Yes	12	23%
No	40	77%

Table B-5. "Do you have flood insurance for your home?"

	Total	Percent
Yes	27	24%
No	85	76%

Most respondents have at least some of the basic supplies recommended to protect their well-being in the 72-hour period immediately after a disaster. Of the 18 items recommended, only six were owned by over half of the 143 respondents. The most commonly held item, a can opener, was only owned by 67 percent of participating community members. The least common item, a secondary source of heat, was possessed by only 12 community members.

Table B-6. "If a severe hazard event occurred today such that all services were cut off from your home (power, gas, water, sewer) and you were unable to leave or access a store for 72 hours, which of these items do you have readily available?"

	Total	Percent
Potable water (3 gallons per person)	86	60%
Cooking and eating utensils	80	56%
Can opener	96	67%
Canned/nonperishable foods (ready to eat)	87	61%
Gas grill/camping stove	58	41%
Extra medications	54	38%
First aid kit/supplies	73	51%
Portable AM/FM radio (solar powered, hand crank, or batteries)	48	34%
Handheld "walkie-talkie" radios (with batteries)	22	15%
Important family photos/documentation in a water and fireproof container	40	28%
Extra clothes and shoes	61	43%
Blanket(s)/sleeping bags	67	47%
Cash	45	31%
Flashlight (with batteries)	80	56%
Gasoline	15	10%
Telephone (with batteries)	44	31%
Pet supplies	38	27%
Secondary source of heat	12	8%

Community Preparedness

A connected community builds resiliency by providing neighbor-to-neighbor assistance on a short-term basis until emergency response personnel or supplies arrive. Identifying and understanding the needs of vulnerable neighbors (including the elderly, very, young, or disabled), allows community members to adequately assist those around them. In the survey, the City found that less than a third of respondents felt as though they were familiar with the special needs of their neighbors in the event of a disaster.

Table B-7. "Are you familiar with the special needs of your neighbors in the event of a disaster situation? (Special needs may include limited mobility, severe medical conditions, memory impairments.)"

	Total	Percent
Yes	38	29%
No	93	71%

Another way to improve community preparedness is to encourage community members be trained as part of South Gate's Community Emergency Response Team (CERT). CERT volunteers are trained in basic emergency response skills, including search and rescue, team organization, and evacuation safety procedures. During an emergency, community members who are CERT-trained can care for and protect others and assist and supplement emergency response professionals. Only about one-fifth of respondents were CERT-trained.

Table B-8. "Are you a trained member of your Community Emergency Response Team (CERT)?"

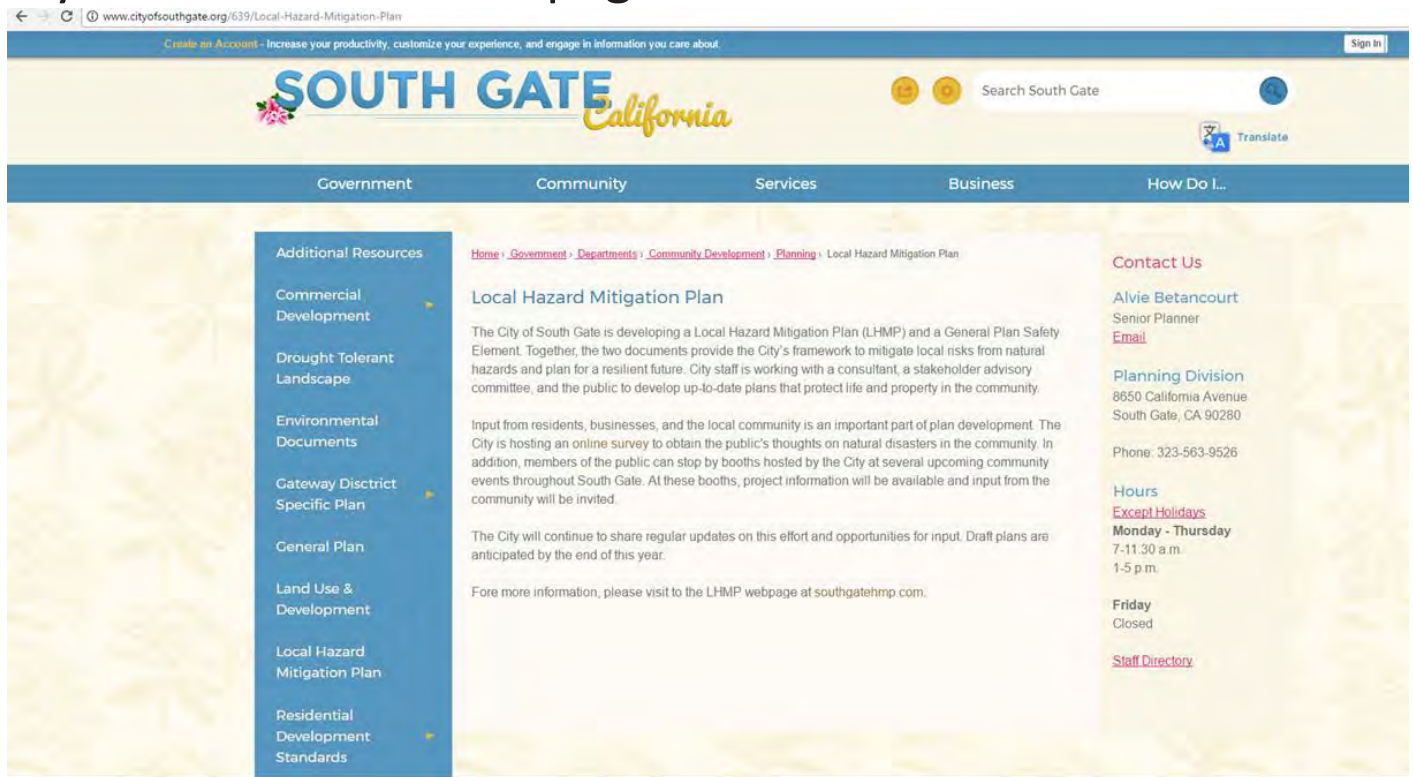
	Total	Percent
Yes	25	19%
No, but I would like to learn more about CERT.	72	55%
No, I am not interested in being a trained CERT member.	33	25%

Finally, community members were asked to identify which recommendations they would like to see the City pursue to improve resiliency and community engagement for future emergencies. Of the 143 participants in the survey, over half favored increased notifications and communication surrounding emergencies.

Table B-9. "How can the City help you become more prepared for a disaster?"

	Total	Percent
Provide effective emergency notifications and communication.	73	51%
Provide training and education to residents and business owners on how to reduce future damage.	66	46%
Provide community outreach regarding emergency preparedness.	61	43%
Create awareness of special needs and vulnerable populations.	53	37%

City of South Gate Webpage:



LHMP Project Website:

City of South Gate
Local Hazard Mitigation Plan and Safety Element Update

Project Overview

In July 2015, the City of South Gate kicked off the development of a Local Hazard Mitigation Plan (LHMP) and an update to the General Plan Safety Element. Together, the two documents provide the City's framework to mitigate local risks to natural hazards and plan for a resilient future. The City will seek FEMA certification of the LHMP to maximize the City's eligibility for future grant funding for hazard mitigation.

Plan preparation is occurring during summer and fall 2015. To guide plan development, the City is conducting public outreach and convening a stakeholder advisory group. Opportunities for involvement and project updates will be available on this website. Final action on the project will occur with the City Council's adoption of both documents in early 2016.

For questions or comments, please contact the City's Project Manager, Alvie Betancourt:

Alvie Betancourt
Senior Planner
City of South Gate
abetancourt@sogate.org
323-642-9526
8650 California Avenue
South Gate, CA 90280

Sign Up to Receive Updates!

Email Address:

Retype Email Address:

☐ I'm not a robot

Upcoming Events

Family Day, October 24 The City of South Gate will host a project booth at Family Day. Come and provide input and learn more about the project. More information on the event is available [online](#).

The City will offer additional opportunities for public input during fall 2015. Check back here for more information.

Project Documents

No project documents available at this time.

Project Background

The City of South Gate seeks to proactively minimize the potential impacts of natural hazards in the community. Earthquakes, flooding, and windstorms are some of the key hazards that threaten the community. The LHMP and the Safety Element work together to provide a framework for analyzing, preparing, and mitigating risks from these hazards.

The **Safety Element** will serve as an adopted element of the General Plan, forming part of the City's blueprint for future growth and development. The Safety Element is long-term plan with a 20-year horizon. The California Government Code establishes the requirements for this mandatory part of the General Plan. The element will include policies to mitigate hazards through land use, design measures, and programs. As a part of the General Plan, the Safety Element will provide direction that the City will implement through the Zoning Ordinance and other mechanisms. The element will consolidate and reorganize issues currently contained in the Green City Element and the Public Facilities Element of the General Plan.

The **Local Hazard Mitigation Plan** is a five-year strategic plan that also seeks to identify and mitigate natural hazards. The LHMP is distinct from the Safety Element, directly responding to the requirements of the federal Disaster Mitigation Act (DMA) of 2005. The DMA establishes requirements to identify hazards, evaluate mitigations, and prioritize strategies to mitigate hazard risks. Completion of the LHMP and achievement of certification by FEMA provides the City with access to two competitive FEMA grant programs: the Hazard Mitigation Grant Program (HMGP) and the Pre-Disaster Mitigation Program (PDM). To maintain eligibility for FEMA funding, the City must update the LHMP a minimum of once every five years.

By integrating the LHMP with the Safety Element, the City will also achieve eligibility for additional post-disaster funding from the State of California. The City will integrate the LHMP by amending or appending it to the Safety Element. The Safety Element will include a framework of goals, objectives, and policies. The LHMP will rely on this policy framework, providing related mitigation actions and strategies to implement the Safety Element.

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How safe is your home?

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Please take a few minutes to fill out this survey and tell the City your thoughts on the safety of your community.

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¿Qué tan segura es su casa?

¿Está listo(a) para desastres? Su aporte es crítico para el proceso de planificación sobre peligros.

Por favor tome unos minutos para llenar esta encuesta y decíle a la Ciudad sus pensamientos sobre la seguridad de su comunidad.

Tome la encuesta sobre los peligros en Español

Planning Commission Agenda Bill:

ITEM NO. 3

City of South Gate PLANNING COMMISSION

AGENDA BILL

For the Regular Meeting of: April 5, 2016

Senior Planner:


Alvie Betancourt

Director Community Development:


Joe Perez

**SUBJECT: SAFETY ELEMENT AND LOCAL HAZARD MITIGATION PLAN -
UPDATE**

RECOMMENDED MOTION: Receive and File

NOTICING PROCEDURES: None. This is a discussion and preview of the upcoming Safety Element and Local Hazard Mitigation Plans. No decisions will be requested of the Planning Commission at this time.

REPORT SUMMARY: The Planning Division is in the process of updating the General Plan Safety Element and the Local Hazard Mitigation Plan (LHMP). City staff, with the support of the consultant team (Michael Baker International), has conducted three steering committee meetings this fiscal year with Finance, Police, Public Works, Parks and Recreation and County Fire participants. Furthermore, an interactive website where residents were able to contribute to the data gathering process was made available. We also conducted Federal Emergency Management Agency (FEMA) mandated public outreach by hosting a booth at the October 24, 2015 Family Day event at South Gate Regional Park; over 60 participants providing feedback toward both efforts and took part in survey and data collection efforts. Next steps include producing draft documents for staff review followed by public dissemination and submittal to FEMA for certification.

The Safety Element is a mandatory element of the General Plan required by Senate Bill (SB) 351, an act that became law on February 23, 1971. The purpose of the General Plan Safety Element is to identify natural or human activity-related hazards that exist in South Gate and to define policy objectives and implementation actions to address them. Some naturally occurring hazards may be unavoidable, but the potential impact on South Gate can be reduced through advance planning and preparation. The Safety Element addresses geologic, seismic, flood, and fire hazards, as well as hazards created by human activity such as hazardous materials and incidents that call for emergency protection. The Safety Element describes the City's efforts to prepare for and respond to emergencies. Public safety planning generally focuses on how an agency or community members will prepare for, respond to, or recover from a disaster. Hazard mitigation planning focuses on how the impact of a disaster might be lessened. The Local Hazard Mitigation Plan includes an assessment of the City's risk related to natural hazard impacts such as drought, seismic events, extreme heat, and flooding. The LHMP also includes a comprehensive set of actions the City will complete to mitigate, or reduce, the impacts of those hazards.

1

The LHMP is distinct from the Safety Element, directly responding to the requirements of the federal Disaster Mitigation Act (DMA) of 2005. The DMA establishes requirements to identify hazards, evaluate mitigations, and prioritize strategies to mitigate hazard risks. Completion of the LHMP and achievement of certification by FEMA provides the City with access to two competitive FEMA grant programs: the Hazard Mitigation Grant Program (HMGP) and the Pre-Disaster Mitigation Program (PDM). To maintain eligibility for FEMA funding, the City must update the LHMP a minimum of once every five years.

By integrating the LHMP with the Safety Element, the City will achieve eligibility for additional post-disaster funding from the State of California. The City will integrate the LHMP by annexing or appending it to the Safety Element. The Safety Element will include a framework of goals, objectives, and policies. The LHMP will rely on this policy framework, providing related mitigation actions and strategies to implement the Safety Element.

ATTACHMENTS: None at this time.

APPENDIX C – MASTER FACILITIES LIST

Table C-1 provides a master list of critical facilities and facilities of concern. Figure C-1 maps facilities of concern.

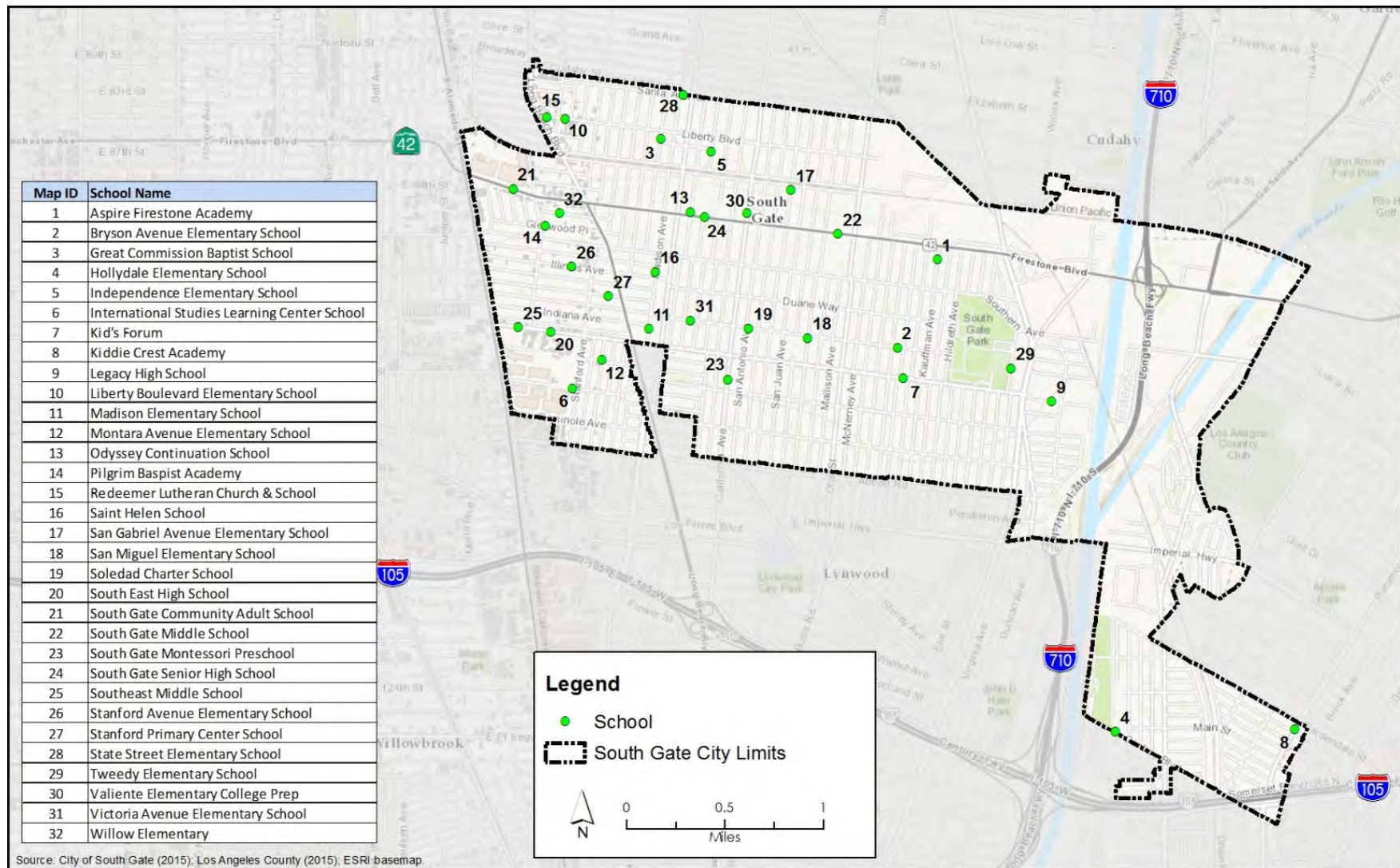
Table C-1. Master Facilities List

	Facility	Address	Owner
City Facilities	City of South Gate Civic Center	8650 California Avenue	City of South Gate
	Public Works Corporate Yard	4244 Santa Ana Street	City of South Gate
	Parks & Recreation - Administration	4900 Southern Avenue	City of South Gate
	Parks & Recreation - South Gate Girls Clubhouse	4940 Southern Avenue	City of South Gate
	Parks & Recreation - South Gate Golf Course	9615 Pinehurst Avenue	City of South Gate
	Parks & Recreation - South Gate Senior Center	4855 Tweedy Boulevard	City of South Gate
	Parks & Recreation - South Gate Sports Center	9520 Hildreth Avenue	City of South Gate
	Parks & Recreation - Hollydale Community Resource Center	12221 Industrial Avenue	City of South Gate
	Parks & Recreation - Westside Community Resource Center	9200 State Street	City of South Gate
County Facilities	LA County Fire Station #54	4867 Southern Pl	City of South Gate
	L.A. County Fire Station #57	5720 Gardendale Avenue	City of South Gate
Schools (Facilities of Concern)	Aspire Firestone Academy	8929 Kauffman Ave, South Gate, CA 90280	LA Unified School District
	Bryson Avenue Elementary School	4470 Missouri Avenue, South Gate, CA 90280	LA Unified School District
	Great Commission Baptist School	8420 South Gate Avenue, South Gate, CA 90280	LA Unified School District
	Hollydale Elementary School	5511 Century Boulevard, South Gate, CA 90280	Paramount School District
	Independence Elementary School	8435 Victoria Avenue, South Gate, CA 90280	LA Unified School District

Facility	Address	Owner
International Studies Learning Center School	2701 Sequoia Drive, South Gate, CA 90280	LA Unified School District
Kiddie Crest Academy	13067 Paramount Blvd, South Gate, CA 90280	LA Unified School District
Kid's Forum	4513 Tweedy Boulevard, South Gate, CA 90280	LA Unified School District
Legacy High School	5225 Tweedy Blvd, South Gate, CA 90280	LA Unified School District
Liberty Boulevard Elementary School	2728 Liberty Boulevard, South Gate, CA 90280	LA Unified School District
Madison Elementary School	9820 Madison Avenue, South Gate, CA 90280	LA Unified School District
Montara Avenue Elementary School	10018 Montara Avenue, South Gate, CA 90280	LA Unified School District
Odyssey Continuation School	8693 Dearborn Avenue, South Gate, CA 90280	LA Unified School District
Pilgrim Baptist Academy	2702 Glenwood Pl, South Gate, CA 90280	LA Unified School District
Redeemer Lutheran Church & School	2626 Liberty Blvd, South Gate, CA	LA Unified School District
Saint Helen School	9329 Madison Ave, South Gate, CA	LA Unified School District
San Gabriel Avenue Elementary School	8628 San Gabriel Avenue, South Gate, CA 90280	LA Unified School District
San Miguel Elementary School	9801 San Miguel Avenue, South Gate, CA 90280	LA Unified School District
Soledad Charter School	3616 Missouri Ave, South Gate, CA 90280	LA Unified School District
South East High School	2720 Tweedy Boulevard, South Gate, CA 90280	LA Unified School District
South Gate Community Adult School	2525 Firestone Boulevard, South Gate, CA 90280	LA Unified School District
South Gate Middle School	4100 Firestone Boulevard, South Gate, CA 90280	LA Unified School District
South Gate Montessori Preschool	10108 California Ave, South Gate, CA	LA Unified School District
South Gate Senior High School	3351 Firestone Boulevard, South Gate, CA 90280	LA Unified School District
Southeast Middle School	2560 Tweedy Boulevard, South Gate, CA 90280	LA Unified School District
Stanford Avenue Elementary School	2833 Illinois Avenue, South Gate, CA 90280	LA Unified School District

	Facility	Address	Owner
	Stanford Primary Center School	3020 Kansas Avenue, South Gate, CA 90280	LA Unified School District
	State Street Elementary School	3211 Santa Ana Street, South Gate, CA 90280	LA Unified School District
	Tweedy Elementary School	9724 Pinehurst Avenue, South Gate, CA 90280	LA Unified School District
	Valiente Elementary College Prep	8691 California Ave, South Gate, CA 90280	LA Unified School District
	Victoria Avenue Elementary School	3320 Missouri Avenue, South Gate, CA 90280	LA Unified School District
	Willow Elementary	2777 Willow Place, South Gate, CA 90280	LA Unified School District
Other Facilities	High Tension Power Lines	Powerline Easements	LA DWP
	Water Infrastructure (Well Sites and Reservoirs)	Confidential List	Confidential List
	MWD Water Line	Multiple	MWD
	Bridges	Multiple	Multiple
Source: City of South Gate			

Figure C-1. Facilities of Concern





Central Basin
Municipal Water District

Appendix H: City of Whittier 2015 Natural Hazards Mitigation Plan

Central Basin Municipal Water District | 2020 Urban Water Management Plan



2015 Natural Hazards Mitigation Plan



***Final Draft Plan
December 8, 2015***

**Prepared under contract with:
Emergency Planning Consultants
San Diego, California**

Carolyn J. Harshman, CEM

Credits



Acknowledgements

City of Whittier City Council

- Fernando Dutra, Mayor
- Joe Vinatier, Mayor Pro Tempore
- Owen Newcomber, Council Member
- Bob Henderson, Council Member
- Cathy Warner, Council Member

City of Whittier Administration

- Jeff Collier, City Manager
- Nancy Mendez, Assistant City Manager
- Conal McNamara, Community Development Director

Special Thanks

Hazard Mitigation Planning Team:

<i>Agency</i>	<i>Name</i>	<i>Department</i>	<i>Position</i>
City of Whittier	Don Dooley, Chair of Planning Team	Community Development Department	Planning Services Manager
	Greg Alaniz	Parks & Recreation Department	Community Services Manager
	Dave Edgell	Public Works Department – Streets	Streets Manager
	Carl Hassel	Administration	Capital Projects Manager
	Sonya Lui	Community Development Department	Principal Planner
	Jared Macias	Public Works Department - Water	Water Manager
	Chris Magdosku	Public Works Department - Engineering	Assistant Director of Public Works
	Yolanda Martinez	Controller's Office/Risk & Emergency Management	Human Resources Manager & Risk/Emergency Manager
	Brett Petroff	Controller's Office/Risk & Emergency Management	Emergency Operations Coordinator
	Jay Tatman	Police Department	Police Lieutenant
	Carlos Yado,	Community Development Department – Building & Safety	Building Services Manager (Building Official)
County of Los Angeles	Devin Trone	Fire Department	Battalion Chief

Consulting Services



Emergency Planning Consultants

- ✓ Project Manager: Carolyn J. Harshman, CEM, President
- ✓ Research Assistant: Melissa Minas

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epc@pacbell.net
www.carolynharshman.com

Note: The maps in this plan were provided by the City of Whittier, County of Los Angeles, Federal Emergency Management Agency (FEMA), or were acquired from public internet sources. Care was taken in the creation of the maps contained in this Plan, however they are provided "as is". The City of Whittier cannot accept any responsibility for any errors, omissions or positional accuracy, and therefore, there are no warranties that accompany these products (the maps). Although information from land surveys may have been used in the creation of these products, in no way does this product represent or constitute a land survey. Users are cautioned to field verify information on this product before making any decisions.

Mandated Contents

In an effort to assist the reader and reviewer of this document the jurisdiction has inserted the mandated contents as identified in the Disaster Mitigation Act of 2000 (Public Law – 390). Following is an example of those references – inserted as footnotes throughout the plan.

EXAMPLE

ELEMENT A: PLANNING PROCESS | A1

A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))



Table of Contents

PART I: BACKGROUND

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Part I: BACKGROUND

Executive Summary

The Natural Hazards Mitigation Plan (Mitigation Plan) was prepared in response to Disaster Mitigation Act of 2000 (DMA 2000). DMA 2000 (also known as Public Law 106-390) requires state and local governments to prepare Mitigation Plans to document their Mitigation Planning process, and identify hazards, potential losses, mitigation needs, goals, and strategies. This type of planning supplements the City's comprehensive emergency management program.

Under DMA 2000, each state and local government must have a federally approved Mitigation Plan to be eligible for hazard mitigation grant funding. This is the third mitigation plan prepared for the City of Whittier. Preceding plans were approved by FEMA in 2005 and 2010.

The Disaster Mitigation Act of 2000 (DMA 2000) is intended to facilitate cooperation between state and local governments, prompting them to work together. Through collaboration, mitigation needs can be identified before disasters strike, resulting in faster allocation of resources and more effective risk reduction projects.

The following FEMA definitions are used throughout this plan:

Hazard Mitigation – “Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards”.

Planning – “The act or process of making or carrying out plans; specifically, the establishment of goals, policies, and procedures for a social or economic unit.”

(Source: FEMA, 2002, *Getting Started, Building Support for Mitigation Planning*, FEMA 386-1)

Mitigation Planning Benefits

Planning ahead helps residents, businesses, and government agencies effectively respond when disasters strike; and keeps public agencies eligible for Hazard Mitigation Grant Program (HMGP) funding. The long-term benefits of mitigation planning include:

- ✓ Greater understanding of hazards faced by a community
- ✓ Use of limited resources on hazards with the greatest effect on a community
- ✓ Financial savings through partnerships for planning and mitigation
- ✓ Reduced long-term impacts and damages to human health and structures, and lower repair costs
- ✓ More sustainable, disaster-resistant communities.

Hazard Land Use Policy in California

Planning for hazards should be an integral element of any city's land use planning program. All California cities and counties have General Plans and the implementing ordinances that are required to comply with the statewide land use planning regulations.



The continuing challenge faced by local officials and state government is to keep the network of local plans effective in responding to the changing conditions and needs of California's diverse communities, particularly in light of the very active seismic region in which we live.

Planning for hazards requires a thorough understanding of the various hazards facing the City and region as a whole. Additionally, it's important to take an inventory of the structures and contents of various City holdings. These inventories should include the compendium of hazards facing the city, the built environment at risk, the personal property that may be damaged by hazard events and most of all, the people who live in the shadow of these hazards.

Support for Hazard Mitigation

All mitigation is local and the primary responsibility for development and implementation of risk reduction strategies and policies lies with each local jurisdiction. Local jurisdictions, however, are not alone. Partners and resources exist at the regional, state and federal levels. Numerous California state agencies have a role in hazards and hazard mitigation.

Some of the key agencies include:

- ✓ California Office of Emergency Services (Cal OES) is responsible for disaster mitigation, preparedness, response, recovery, and the administration of federal funds after a major disaster declaration;
- ✓ Southern California Earthquake Center (SCEC) gathers information about earthquakes, integrates information on earthquake phenomena, and communicates this to end-users and the general public to increase earthquake awareness, reduce economic losses, and save lives.
- ✓ California Department of Forestry and Fire Protection (CAL FIRE) is responsible for all aspects of wildland fire protection on private and state properties, and administers forest practices regulations, including landslide mitigation, on non-federal lands.
- ✓ California Division of Mines and Geology (DMG) is responsible for geologic hazard characterization, public education, and the development of partnerships aimed at reducing risk.
- ✓ California Division of Water Resources (DWR) plans, designs, constructs, operates, and maintains the State Water Project; regulates dams; provides flood protection and assists in emergency management. It also educates the public, serves local water needs by providing technical assistance
- ✓ FEMA provides hazard mitigation guidance, resource materials, and educational materials to support implementation of the capitalized DMA 2000.
- ✓ United States Census Bureau (USCB) provides demographic data on the populations affected by natural disasters.
- ✓ United States Department of Agriculture (USDA) provides data on matters pertaining to land management.

A Hazard Mitigation Planning Team (Planning Team) consisting of City and County staff from various departments worked with Emergency Planning Consultants using the following approach to create the 2015 Mitigation Plan:

- ✓ Identify hazards posing a significant threat
- ✓ Profile these hazards
- ✓ Estimate inventory at risk and potential losses associated with these hazards



- ✓ Develop mitigation strategies and goals that address these hazards
- ✓ Develop plan maintenance procedures for implementation after the joint review by Cal OES and FEMA and FEMA approval.

The requirements of DMA 2000 only apply to natural hazards. The Planning Team chose to continue to focus on natural hazards for the 2015 update.

As required by DMA 2000, the City informed the public about the planning process and provided opportunities for public input. In addition, key agencies and stakeholders shared their expertise during the planning process. This Mitigation Plan documents the process, outcome, and future of the City's mitigation planning efforts.

How is the Plan Organized?

The structure of the plan enables people to use a section of interest to them and allows the City to review and update sections when new data is available. The ease of incorporating new data into the plan will result in a Mitigation Plan that remains current and relevant to the City of Whittier.

Following is a description of each part and section of the plan:

Part I: Background

Executive Summary

The Executive Summary provides a very general overview of mitigation planning, the planning process, and the steps involved in implementing the plan.

Section 1: Introduction

The Introduction describes the background and purpose of developing the Mitigation Plan for the City of Whittier.

Section 2: Community Profile

The section presents the history, geography, demographics, and socioeconomics of the City of Whittier. It provides valuable information on the demographics and history of the region.

Part II: Hazard Analysis

This section provides information on the process used to assess the demographics and development patterns for the community along with an assessment of the hazards.

Section 3: Risk Assessment

This section provides information on hazard identification, vulnerability and risk associated with hazards in the City of Whittier.

Sections 4-7: Hazard-Specific Analysis

Hazard-Specific Analysis includes discussion on the four chronic hazards identified by the Planning Team. Chronic hazards are defined as those occurring with some regularity and may be predicted through historic evidence and scientific methods. The chronic hazards addressed in the plan include:

- Section 4: Earthquake
- Section 5: Flood



Section 6: Wildfire
Section 7: Drought

Each Hazard-Specific Analysis includes information on the history, hazard causes, hazard characteristics, and hazard assessment.

Part III: Mitigation Strategies

Section 8: Mitigation Strategies

This section highlights the Mitigation Actions Matrix and: 1) past accomplishments; 2) planning approach; 3) goals and objectives; 4) identification, analysis, and implementation of mitigation activities; 5) prioritized mitigation activities; and 6) next steps.

Section 9: Planning Process

This section describes the mitigation planning process including 1) Planning Team involvement, 2) extended Planning Team support, 3) public and other stakeholder involvement; and 4) integration of existing data and plans.

Section 10: Plan Maintenance

This section provides information on plan implementation, monitoring and evaluation.

Part IV: Appendices

The plan appendices are designed to provide users of the Mitigation Plan with additional information to assist them in understanding the contents of the mitigation plan, and potential resources to assist them with implementation.

Appendix A: Benefit/Cost Analysis

This section describes FEMA's requirements for benefit cost analysis in hazards mitigation, as well as various approaches for conducting economic analysis of proposed mitigation activities.

Mitigation Planning Process

The process for creating the 2015 update to the Natural Hazards Mitigation Plan started with identifying members for the Planning Team. Each team member represented different City department and specific divisions within those departments with a role in mitigation efforts. The Planning Team met and identified characteristics and consequences of natural hazards with significant potential to affect the City.

Hazard mitigation strategy and goals were developed by understanding the risk posed by the identified hazards. The group also determined hazard mitigation activities and priorities to include scenarios for both present and future conditions. The final Mitigation Plan will be implemented through various projects, changes in day-to-day city operations, and through continued hazard mitigation development.



Planning Process Phases*

Throughout the project, the City followed its traditional approach to developing policy documents, including preparation of the First Draft Plan, review by the Planning Team. Then making the Second Draft Plan available to the public and external agencies via the City's website. Comments from the review were discussed by the Planning Team and incorporated into a Third Draft Plan. At that point, the Third Draft Plan was ready for notice and distribution in advance of the City Council meeting. Following adoption by the City Council, the Final Draft Plan was forwarded to Cal OES for review and approval by FEMA. The final step in the plan writing process was addressing minor issues raised during the Cal OES/FEMA review/approval. The resulting document is referred to as the Final Plan.

PLANNING PHASES				
Plan Writing Phase (First Draft Plan)	Plan Review Phase (Second Draft Plan)	Plan Adoption Phase (Third Draft Plan)	Plan Approval Phase (Final Draft Plan)	Plan Implementation Phase
<ul style="list-style-type: none"> Planning Team input – research, meetings, writing, review of First Draft Plan Revised accordingly to create Second Draft Plan 	<ul style="list-style-type: none"> Second Draft Plan made available via the City's website to the public and invited external agencies Incorporate comments into the Third Draft Plan 	<ul style="list-style-type: none"> Public notice of City Council public meeting Third Draft Plan was distributed to the City Council in advance of meeting as well as posted on the City's website. Present Third Draft Plan to the City Council City Council Adopted Plan Incorporate input from City Council public meeting into Final Draft Plan 	<ul style="list-style-type: none"> Submit Final Draft Plan to Cal OES for review and approval by FEMA Address any justified revisions identified by Cal OES or FEMA Receive FEMA approval 	<ul style="list-style-type: none"> Conduct Planning Team meetings Integrate mitigation action items into budget, CIP and other funding and strategic documents



* ELEMENT A: PLANNING PROCESS | A3

A3. Does the Plan document how the public was involved in the planning process during the drafting stage?
(Requirement §201.6(b)(1))



Public Input*

The Plan was available to the public through different venues and will engage the public, involve them in ongoing planning and evaluation, and facilitate communication. The Planning Team recognized that community involvement increases the likelihood that hazard mitigation will become a standard consideration in the City's evolution. In that regard, the Planning Team advertised the availability of the Second Draft Mitigation Plan to the public and to external agencies with an interest in mitigation planning.

Comments gathered from the review were incorporated into the Third Draft Plan which was made available again to the public and external agencies along with notice of the City Council public meeting.

Participating Organizations

For mitigation planning to be successful; like all community planning; it requires collaboration with, and support from, federal, state, local, and regional governments; citizens; the private sector; universities; and non-profit organizations. The Planning Team consulted a variety of sources to ensure that the planning process results in practicable actions tailored to local needs and circumstances. Also, a variety of external organizations were involved in reviewing the draft Mitigation Plan in advance of the City Council public meeting.

City of Whittier and Hazard Mitigation

The potential impact of hazards associated with the City's location and varying terrain make the environment and population vulnerable to natural disaster situations. The City of Whittier is subject to earthquakes, floods, wildfires, and droughts. Any disaster scenario can only be assessed through careful planning and collaboration between public agencies, private sector organizations, and City residents, to make it possible to minimize loss.

The City of Whittier was incorporated in 1898 and since then, residents have experienced numerous disasters and hazardous conditions. Photographs, diaries and newspapers demonstrate that residents of the area have experienced earthquakes, flooding, wildfires, and drought.

While Whittier was sparsely populated, the hazards adversely affected the lives of the residents who depended on the land and climate conditions for food and welfare. Today, as the population density within the City of Whittier continues to increase, the exposure to natural hazards creates a greater risk than previously experienced.

Mitigation Planning

As the cost of damage from disasters continues to increase nationwide, the City of Whittier recognizes the importance of identifying effective ways to reduce vulnerability to disasters. Mitigation Plans assist communities in reducing risk from hazards by identifying resources,

* ELEMENT A: PLANNING PROCESS | A3

A3. Does the Plan document how the public was involved in the planning process during the drafting stage?
(Requirement §201.6(b)(1))



information, and strategies for risk reduction, while helping to guide and coordinate mitigation activities throughout the City.

The Plan provides a set of action items to reduce risk from hazards such as education and outreach programs and the development of partnerships. The Plan also provides for the implementation of preventative activities, including programs that restrict and control development in areas subject to damage from hazards.

The resources and information within the Mitigation Plan:

1. Establish a basis for coordination and collaboration among agencies and the public in the City of Whittier.
2. Identify and prioritize future mitigation projects; and
3. Assist in meeting the requirements of federal assistance programs.

The Mitigation Plan is integrated with other City plans including the Whittier Emergency Operations Plan, Whittier General Plan, the Capital Improvement Plan (CIP), as well as department-specific standard operating procedures.

Mitigation Plan Jurisdiction and Scope

The City's Mitigation Plan affects the areas within the City boundaries, with emphasis on City owned facilities and land. This Plan provides a framework for planning for natural hazards. The resources and background information in the plan address existing and future land development throughout the City of Whittier.

Risk Assessment

Risk assessment is the identification of risks posed by a hazard and the corresponding impacts to the community. This process involves five steps: identify hazards, profile hazards, inventory critical assets, assess risks, and assess vulnerability of future development.

Step 1: Identify Hazards

The Planning Team identified the hazards that could significantly impact the City by referencing the City's General Plan (including the 1993 Background Report and 2014 Housing Element), and the County of Los Angeles All-Hazard Mitigation Plan (2014).

The Planning Team ranked the hazards based on the probability, magnitude/severity, warning time, and duration.

That analysis yielded the following hazards as posing the greatest risk to the City of Whittier: earthquakes, floods, wildfires, and drought.



Step 2: Profile Hazards

Hazard profiles determine the extent to which each hazard could impact the City. Each hazard profile contains the following information:

- ✓ Background and local conditions
- ✓ Historic frequency and probability of occurrence
- ✓ Severity
- ✓ Historic losses and impacts
- ✓ Designated hazard areas

Other factors considered include potential impact, onset, frequency, hazard duration, cascading effects, and recovery time for each hazard. Using this information, the Planning Team assessed the relative risk of each hazard ranging from severe risk to no risk. Where applicable, the source(s) of information, data, and maps showing vulnerable areas and relevant community components are provided.

Step 3: Inventory Critical Assets

Once hazards and profiles were established, locations of critical facilities were plotted and analyzed. To estimate losses from each hazard (number of structures, value of structures and number of people), the Planning Team used local resources; Census data; Hazards U.S.-Multi-Hazard (HAZUS-MH), a Geographic Information System (GIS) risk assessment methodology; and other GIS capabilities.

The inventory of assets shows a range of resources that could be lost or damaged for each hazard such as population, general building stock (residential and commercial), critical facilities (hospitals, police and fire stations, and transportation systems), and utilities.

Step 4: Assess Risks

Estimated losses to structures and their contents, as well as the losses to structure use and function, were identified (as data was available).

Step 5: Vulnerability Analysis of Future Development

This step provides a general description of City facilities and contents in relation to the identified hazards so that mitigation options can be considered in land use planning and future land use decisions. This Mitigation Plan provides comprehensive description of the character of the City of Whittier in Section 2: Community Profile. This description includes the geography and environment, population and demographics, land use and development, housing and community development, employment and industry, and transportation and commuting patterns. Analyzing these components of the City of Whittier helps to identify potential problem areas and serves as a guide for incorporating the goals and ideas contained in this mitigation plan into other community development plans.



Mitigation Goals

The risk assessment and public input involved a review of past mitigation actions, future goals, and appropriate mitigation strategies. The Planning Team identified five mitigation goals that summarize the hazard reduction outcome the City wants to achieve:

- ✓ Protect Life and Property
- ✓ Enhance Public Awareness
- ✓ Preserve Natural Systems
- ✓ Encourage Partnerships and Implementation
- ✓ Strengthen Emergency Services

These goals guided the development and implementation of specific mitigation activities. Many of the mitigation objectives and action items come from current programs. Emphasis was placed on the effectiveness of the activities with respect to their estimated cost.

Plan Review

The First Draft Plan was distributed by Emergency Planning Consultants to the Planning Team for review and input. Following that review, the revisions and recommendations were incorporated into the Second Draft Plan. The public was informed of the availability of the Plan via the City's website. In addition emails were sent to external agencies announcing the City's desire for input on the Second Draft Plan. The Third Draft Plan was produced to incorporate input gathered during the initial public review. The Third Draft Plan was posted again on the City's website along with official notice of the City Council meeting.

The list of external agencies invited to review the plan is an attachment in Section 10: Planning Process along with their input.

Plan Adoption*

The 2015 Mitigation Plan was presented to City Council for adoption on November 10, 2015. A copy of the City Council Resolution is located in Section 10: Planning Process.

Plan Approval

Following incorporation of input from the City Council, the Final Draft Plan was forwarded to Cal OES for review and approval by FEMA. FEMA issued an approval on [REDACTED], 2016.

* ELEMENT E: PLAN ADOPTION | E1

E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))



Point of Contact

To request information or provide comments regarding this Mitigation Plan, please contact:

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Mailing Address	13230 Penn Street Whittier, California 90602
Telephone Number	(562) 567-9342

Plan Maintenance

Mitigation planning is an ongoing process involving changes as new hazards occur, as the area develops, and as more is learned about hazards and their impacts. The Planning Team will monitor changing conditions, help implement mitigation activities, annually review the plan to determine if City goals are being met, and provide an update to Cal OES and FEMA every five years. In addition, the Planning Team will review After-Action Reports generated after any disaster that impacts the City, and revise the mitigation plan, as needed.



Section 1: Introduction

City of Whittier is located in Los Angeles County and offers the benefits of living in a Mediterranean type of climate. The City is characterized by the unique and attractive landscape that makes the area so popular. However, the potential impacts of natural hazards associated with the terrain make the environment and population vulnerable to natural disaster situations.

The City is subject to earthquakes, flooding, wildfires, and drought. It is impossible to predict exactly when these disasters will occur, or the extent to which they will affect the City. However, with careful planning and collaboration among public agencies, private sector organizations, and citizens within the community, it is possible to minimize the losses that can result from these natural disasters.

Why Develop a Mitigation Plan?

As the costs of damage from disasters continue to increase, the City realizes the importance of identifying effective ways to reduce vulnerability to disasters. Mitigation plans assist communities in reducing risk from hazards by identifying resources, information, and strategies for risk reduction, while helping to guide and coordinate mitigation activities throughout the City.

The plan provides a set of action items to reduce risks from hazards through education and outreach programs and to foster the development of partnerships, and implementation of preventative activities such as land use programs that restrict and control development in areas subject to damage from hazards.

The resources and information within the Mitigation Plan:

- ✓ Establish a basis for coordination and collaboration among agencies and the public of City of Whittier;
- ✓ Identify and prioritize future mitigation projects; and
- ✓ Assist in meeting the requirements of federal assistance programs.

The Mitigation Plan works in conjunction with other City plans, including the City's General Plan, Emergency Operations Plan, and Capital Improvement Plan.

Although vulnerability to natural hazards is clear, it is impossible to predict exactly when these disasters will occur, or the extent to which they will affect the City. However, with careful planning and collaboration among public agencies, private sector organizations, and citizens within the community, it is possible to minimize the losses that can result from these natural disasters. As the population of the region continues to increase, the exposure to hazards creates an even higher risk than previously experienced.



Mitigation Planning Process

The process for updating the Mitigation Plan started with identifying members for the Planning Team. Each team member represented different City department and specific divisions within those departments with a role in mitigation efforts. The Planning Team met and identified characteristics and consequences of natural hazards with significant potential to affect the City.

Hazard mitigation strategy and goals were developed by understanding the risk posed by the identified hazards. The group also determined hazard mitigation activities and priorities to include scenarios for both present and future conditions. The final Mitigation Plan will be implemented through various projects, changes in day-to-day city operations, and through continued hazard mitigation development.

Why Plan for Hazards in City of Whittier?

Hazards impact residents, businesses, property, the environment, and the economy of City of Whittier. Based on history and science, natural hazards have or could potentially expose the City to the financial and emotional costs of recovery. The risk associated with hazards increases as more people move to areas affected by hazards.

Even in those communities such as Whittier that are essentially “built-out” (i.e., have little or no vacant land remaining for development), population density continues to increase when existing lower density residential and non-residential development is replaced with medium and high density residential development projects.

The inevitability of hazards, and the growing population and activity within the City create an urgent need to develop strategies, coordinate resources, and increase public awareness to reduce risk and prevent loss from future hazard events. Identifying the risks posed by hazards, and developing strategies to reduce the impact of a hazard event can assist in protecting life and property of citizens and communities. Local residents and businesses can work together with the City to create a Mitigation Plan that addresses the potential impacts of hazard events.

Hazard Mitigation Legislation

Relevant hazard mitigation legislation and grants are highlighted below.

Hazard Mitigation Grant Program

In 1974, Congress enacted the Robert T. Stafford Disaster Relief and Emergency Act, commonly referred to as the Stafford Act. In 1988, Congress established the Hazard Mitigation Grant Program (HMGP) via Section 404 of the Stafford Act. Regulations regarding HMGP implementation based on the DMA 2000 were initially changed by an Interim Final Rule (44 CFR Part 206, Subpart N) published in the Federal Register on February 26, 2002. A second Interim Final Rule was issued on October 1, 2002.

The HMGP helps states and local governments implement long-term hazard mitigation measures for natural hazards by providing federal funding following a federal disaster declaration. Eligible applicants include state and local agencies, Indian tribes or other tribal organizations, and certain nonprofit organizations.



In California, the HMGP is administered by Cal OES. Examples of typical HMGP projects include:

- ✓ Property acquisition and relocation projects
- ✓ Structural retrofitting to minimize damages from earthquake, flood, high wind, wildfire, or other natural hazards
- ✓ Elevation of flood-prone structures
- ✓ Vegetative management programs, such as:
- ✓ Brush control and maintenance
- ✓ Fuel break lines in shrubbery
- ✓ Fire-resistant vegetation in potential wildland fire areas

Pre-Disaster Mitigation Program

The Pre-Disaster Mitigation Program (PDM) was authorized by §203 of the Stafford Act, 42 United States Code (USC), as amended by §102 of the DMA 2000. Funding is provided through the National Pre-Disaster Mitigation Fund to help state and local governments (including Indian tribal governments) implement cost-effective hazard mitigation activities that complement a comprehensive mitigation program.

In Fiscal Year 2009, two types of grants (planning and competitive) were offered under the PDM Program. Planning grants allocate funds to each state for Mitigation Plan development. Competitive grants distribute funds to states, local governments, and federally recognized Indian tribal governments via a competitive application process. FEMA reviews and ranks the submittals based on pre-determined criteria. The minimum eligibility requirements for competitive grants include participation in good standing in the National Flood Insurance Program (NFIP) and a FEMA-approved Mitigation Plan.

(Source: <http://www.fema.gov/fima/pdm.shtm>)

"Floods and hurricanes happen. The hazard itself is not the disaster – it's our habits, it's how we build and live in those areas...that's the disaster."

Flood Mitigation Assistance Program

The Flood Mitigation Assistance (FMA) Program was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 (42 U.S.C. 4101). Financial support is provided through the National Flood Insurance Fund to help states and communities implement measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP.

Craig Fugate,
FEMA Director

Three types of grants are available under FMA: planning, project, and technical assistance. Planning grants are available to states and communities to prepare Flood Mitigation Plans. NFIP-participating communities with approved Flood Mitigation Plans can apply for project grants to implement measures to reduce flood losses. Technical assistance grants in the amount of 10 percent of the project grant are available to the state for program administration. Communities that receive planning and/or project grants must participate in the NFIP.



Examples of eligible projects include elevation, acquisition, and relocation of NFIP-insured structures. (Source: <http://www.fema.gov/fima/fma.shtm>)

Disaster Mitigation Act of 2000

DMA 2000 (DMA 2000) was signed by President Clinton on October 30, 2000 (Public Law 106-390). Section 322 primarily deals with the development of Mitigation Plans. The Interim Final Rule for planning provisions (44 CFR Part 201) was published in the Federal Register twice: February 26, 2002 and October 1, 2002. The Mitigation Planning requirements are implemented via 44 CFR Part 201.6.

DMA 2000 was designed to establish a national program for pre-disaster mitigation, streamline disaster relief at the federal and state levels, and control federal disaster assistance costs. Congress believed these requirements would produce the following benefits:

- ✓ Reduce loss of life and property, human suffering, economic disruption, and disaster costs.
- ✓ Prioritize hazard mitigation at the local level with increased emphasis on planning and public involvement, assessing risks, implementing loss reduction measures, and ensuring critical facilities/services survive a disaster.
- ✓ Promote education and economic incentives to form community-based partnerships and leverage non-federal resources to commit to and implement long-term hazard mitigation activities.

Under DMA 2000 state and local government (each city, county, and special district), and tribal government must develop a Mitigation Plan to be eligible to receive HMGP funds. Every mitigation plan, which must be reviewed by the state and approved by FEMA, should address the following items:

- ✓ Plan Promulgation
- ✓ Planning Process including Public Involvement
- ✓ Hazard Identification and Risk Assessment
- ✓ Mitigation Strategy
- ✓ Plan Implementation and Maintenance Procedures
- ✓ Specific State Requirements

State and Federal Support

While local jurisdictions have primary responsibility for developing and implementing hazard mitigation strategies, they are not alone. Various state and federal partners and resources can help local agencies with mitigation planning.

Cal OES is the lead agency for mitigation planning support to local governments. In addition, FEMA offers grants, tools, and training.

The Mitigation Plan was prepared in accordance with the following regulations and guidance:

- ✓ DMA 2000 (Public Law 106-390, October 10, 2000)



- ✓ 44 CFR Parts 201 and 206, Mitigation Planning and Hazard Mitigation Grant Program, Interim Final Rule, October 1, 2002
- ✓ 44 CFR Parts 201 and 206, Mitigation Planning and Hazard Mitigation Grant Program, Interim Final Rule, February 26, 2002
- ✓ How-To Guide for Using HAZUS-MH for Risk Assessment, (FEMA 433), February 2004
- ✓ Mitigation Planning “How-to” Series (FEMA 386-1 through 9 available at: <http://www.fema.gov/fima/planhowto.shtm>)

HAZUS-MH uses	✓ Getting Started: Building Support For Mitigation Planning (FEMA 386-1)
Geographic Information	✓ Understanding Your Risks: Identifying Hazards and Estimating Losses (FEMA 386-2)
System technology to	✓ Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies (FEMA 386-3)
produce detailed maps and	✓ Bringing the Plan to Life: Implementing the Mitigation Plan (FEMA 386-4)
analytical reports on	✓ Using Benefit-Cost Review in Mitigation Planning (FEMA 386-5)
physical damage to	✓ Integrating Historic Property and Cultural Resource Considerations into Mitigation Planning (FEMA 386-6)
building stock, critical	✓ Integrating Manmade Hazards Into Mitigation Planning (FEMA 386-7)
facilities, transportation	
systems, and utilities.	

- ✓ Multi-Jurisdictional Mitigation Planning (FEMA 386-8)
- ✓ Using the Mitigation Plan to Prepare Successful Mitigation Projects (FEMA 386-9)
- ✓ State and Local Plan Interim Criteria Under the DMA 2000, July 11, 2002, FEMA
- ✓ Mitigation Planning Workshop For Local Governments-Instructor Guide, July 2002, FEMA
- ✓ Report on Costs and Benefits of Natural Hazard Mitigation, Document #294, FEMA
- ✓ LHMP Development Guide – Appendix A - Resource, Document, and Tool List for Local Mitigation Planning, December 2, 2003, Cal OES

Hazards U.S. – Multi-Hazard

In 1997, FEMA developed a standardized model for estimating losses caused by an earthquake. Hazards U.S. (HAZUS) addressed the need for more effective national, state, and local planning and the need to identify areas that face the highest risk and potential for loss.

Hazards U.S. Multi-Hazard (HAZUS-MH) provides models to estimate potential losses from floods (coastal and riverine) and winds (hail, hurricane, tornado, tropical cyclone, and thunderstorm). HAZUS-MH applies engineering and scientific risk calculations developed by hazard and information technology experts to provide defensible damage and loss estimates. This methodology provides a consistent framework for assessing risk across a variety of hazards.

HAZUS-MH uses Geographic Information System technology to produce detailed maps and analytical reports on physical damage to building stock, critical facilities, transportation systems, and utilities. The damage reports cover induced damage (debris, fire, hazardous material, and



inundation) and direct economic and social losses (casualties, shelter requirements, and economic impacts), promoting standardization.

HAZUS maps and reports created by the County of Los Angeles are included in the Hazard-Specific Sections.

Who Does the Mitigation Plan Affect?

The Mitigation Plan affects the areas within the City of Whittier boundaries and City owned facilities and land. This plan provides a framework for planning for natural hazards. The resources and background information in the plan are applicable Citywide and to City-owned facilities outside of the City boundaries, and the goals and recommendations provide groundwork for local mitigation plans and partnerships. Map: City of Whittier shows the regional proximity of the City to its adjoining communities.



Map: City of Whittier
(Source: City of Whittier Community Development Department)





Section 2: Community Profile

Geography and the Environment

The City of Whittier has an area of 15.2 square miles and is located in southeastern Los Angeles County. It is located just south of the Puente Hills.

Information pertaining to the characteristics and features of the City of Whittier were gathered from a variety of sources including the City of Whittier's General Plan (including the Background Report and Housing Element), the City of Whittier's website, the County of Los Angeles All-Hazard Mitigation Plan, and a variety of web resources.

City of Whittier has an area of 15.2 square miles and is located in southeastern Los Angeles County. The City of Whittier borders the City of Hacienda Heights on the north, the City of Santa Fe Springs to the south, the City of Pico Rivera to the west, and the Cities of La Habra and La Habra Heights to the east. The average elevation of the City of Whittier is 365 feet. The Puente Hills are substantial rolling hills with a considerable amount of housing development in the northeast areas adjacent to the City. In the 1990's, the City acquired approximately 1500 acres in the Puente Hills in which no development is permitted. This development prohibition will definitely mitigate any structural loss in the event of a wildland fire.



(Whittier – late 19th Century)

History

The City of Whittier is one of the oldest cities in Los Angeles County and is rich in history. The area comprising the City of Whittier was first settled in 1887 as a Quaker colony and the city itself was incorporated in 1898.

The City is served by Whittier Boulevard (State Highway 72) running northwest to southeast through the City.

The Santa Fe and Southern Pacific railroad serves the city with tracks in the southern area of the City.



Major Rivers

The nearest major river is the San Gabriel River. This River and water reservoirs on the hillsides have a potential minimal impact on the City of Whittier due to elevation of the City. Flooding of the San Gabriel River and severe damage to the flood control levee could inundate the City's Wellfield and Pumping Plant, which supply water to half the City. Although not a major river, Turnbull Canyon Creek channel presents the City's most likely scenario for flooding. There are Flood Zone A's directly below the Turnbull Canyon Creek debris basin. Worsham Creek also flows through the City of Whittier on a seasonal basis.

The San Gabriel River channel and Turnbull Canyon Creek debris basin are part of the County Flood Control District.

Climate

Temperatures in the City of Whittier average approximately 60 degrees in the winter months and 80 degrees in the summer months. However the temperatures can vary over a wide range, particularly when the Santa Ana winds blow, bringing higher temperatures and very low humidity.

Rainfall in the city averages 14.4 inches of rain per year. However the term "average rainfall" is misleading because over the recorded history of rain fall in the City of Whittier rainfall amounts have ranged dramatically from dry to wet years.

Furthermore, actual rainfall in Southern California tends to fall in large amounts during sporadic and often heavy storms rather than consistently over storms at somewhat regular intervals. In short, rainfall in Southern California might be characterized as feast or famine within a single year. Because the metropolitan basin is largely built out, water originating in higher elevation communities can have a sudden impact on adjoining communities that have a lower elevation.

Minerals and Soils

The characteristics of the minerals and soils present in City of Whittier indicate the potential types of hazards that may occur. Rock hardness and soil characteristics can determine whether



or not an area will be prone to geologic hazards such as earthquakes, liquefaction and landslides.

The surface material includes unconsolidated, fine-grained deposits of silt, sand, gravel, and recent flood plain deposits. Torrential flood events can introduce large deposits of sand and gravel. Sandy silt and silt containing clay are moderately dense and firm, and are primarily considered to be prone to liquefaction, an earthquake related hazard. Basaltic lava consists mainly of weathered and non-weathered, dense, fine-grained basalt. Though the characteristics of this lava may offer solid foundation support, landslides are common in many of these areas where weathered residual soil overlies the basalt. Understanding the geologic characteristics of City of Whittier is an important step in hazard mitigation and avoiding at-risk development.

Other Significant Geologic Features

The Elysian Park Fold Thrust Belt is located within the boundaries of Whittier and has the potential for surface fault rupture. Also, significant ground shaking can result from rupture of faults including Puente Hills and Whittier Fault.

The major faults that have the potential to affect Whittier are the:

- ✓ Whittier
- ✓ Puente Hills
- ✓ Elysian Park Fold Thrust Belt
- ✓ Newport-Inglewood
- ✓ Sierra Madre
- ✓ Palos Verdes
- ✓ San Jacinto
- ✓ San Andreas
- ✓ Norwalk

Southern California has a history of powerful and relatively frequent earthquakes, dating back to the powerful magnitude 8.0+ 1857 San Andreas Earthquake which did substantial damage to the relatively few buildings that existed at the time. Paleoseismological research indicates that large magnitude (8.0+) earthquakes occur on the San Andreas Fault at intervals between 45 and 332 years with an average interval of 140 years. Other lesser faults have also caused very damaging earthquakes since 1857. Notable earthquakes include the 1933 Long Beach Earthquake, the 1971 San Fernando Earthquake, the 1987 Whittier-Narrows Earthquake and the 1994 Northridge Earthquake.

In addition, many areas in the Los Angeles Basin have sandy soils that are subject to liquefaction. The City of Whittier has liquefaction zones in the northeastern and southeastern portions of the City as shown on USGS Seismic Hazard Maps.

The City of Whittier also has areas with land movement potential. Currently the city has active landslide activity in the northeast portion of the City. The hillside areas could potentially pose landslide and erosion hazards.



Population and Demographics

City of Whittier has a population of about 85,000 in an area of 15.2 square miles. The population of the City of Whittier has steadily increased from the late 1800's through 2000, and increased 12.9% from 1990 to 2000 according to the 2000 Census.

The increase of people living in City of Whittier creates more community exposure, and changes how agencies prepare for and respond to natural hazards. For example, more people living on the urban fringe can increase risk of fire. Wildfire has an increased chance of starting due to human activities in the urban/rural interface, and has the potential to injure more people and cause more property damage. An urban/wildland fire is not the only exposure to the City of Whittier. In the 1987 publication, *Fire Following Earthquake* issued by the All Industry Research Advisory Council, Charles Scawthorn explains how a post-earthquake urban conflagration would develop. The conflagration would be started by fires resulting from earthquake damage, but made much worse by the loss of pressure in the fire mains, caused by either lack of electricity to power water pumps, and /or loss of water pressure resulting from broken fire mains.

Furthermore, increased density can affect risk. For example, narrower streets are more difficult for emergency service vehicles to navigate, the higher ratio of residents to emergency responders affects response times, and homes located closer together increase the chances of fires spreading.

The City of Whittier is experiencing a great deal of in-fill building, which is increasing the population density creating greater service loads on the built infrastructure, including roads, water supply, sewer services and storm drains.

Hazards do not discriminate, but the impacts in terms of vulnerability and the ability to recover vary greatly among the population. According to Peggy Stahl of the Federal Emergency Management Agency (FEMA) Preparedness, Training, and Exercise Directorate, 80% of the disaster burden falls on the public, and within that number, a disproportionate burden is placed upon special needs groups: women, children, minorities, and the poor.

According to the 2010 Census figures, the demographic makeup of the City is as follows:

Caucasian	28.3%
Hispanic	65.7%
African American	1.3%
Asian	3.8%
Native American	1.3%
Other	25.8%

(Source: www.City-Data.com)

The ethnic and cultural diversity suggests a need to address multi-cultural needs and services.

Although the percentage of poverty in City of Whittier (12.4%) is about 86% that of the state's (14.5%), 17.3% of the people living in poverty in City of Whittier are under 18 years old, and 10% are over 65. Vulnerable populations, including seniors, disabled citizens, women, and children, as well as those people living in poverty, may be disproportionately impacted by hazards.



Examining the reach of hazard mitigation policies to special needs populations may assist in increasing access to services and programs. FEMA's Office of Equal Rights addresses this need by suggesting that agencies and organizations planning for natural disasters identify special needs populations, make recovery centers more accessible, and review practices and procedures to remedy any discrimination in relief application or assistance.

The cost of hazards recovery can place an unequal financial responsibility on the general population when only a small proportion may benefit from governmental funds used to rebuild private structures. Discussions about hazards that include local citizen groups, insurance companies, and other public and private sector organizations can help ensure that all members of the population are a part of the decision-making processes.

Land and Development

Development in Southern California from the earliest days was a cycle of boom and bust. The Second World War however dramatically changed that cycle. Military personnel and defense workers came to Southern California to fill the logistical needs created by the war effort. The available housing was rapidly exhausted and existing commercial centers proved inadequate for the influx of people. Immediately after the war, construction began on the freeway system, and the face of Southern California was forever changed. Home developments and shopping centers sprung up everywhere and within a few decades the urbanized portions of Southern California were virtually built out. This pushed new development further and further away from the urban center.

The City of Whittier General Plan addresses the use and development of private land, including residential and commercial areas. This Plan is one of the City's most important tools in addressing environmental challenges including transportation and air quality; growth management; conservation of natural resources; clean water and open spaces.

The environment of most Los Angeles County cities is nearly identical with that of their immediate neighbors and the transition from one incorporated municipality to another is seamless to most people. Seamless too are the exposures to the hazards that affect all of Southern California.

Housing and Community Development

The City of Whittier is a mature urban community. Only a small portion of the City remains vacant and undeveloped. Residential land uses account for the majority of land uses with over three-fourths of the residential development devoted to single-family homes.

Commercial areas are found along Whittier Boulevard and in the original City center – Uptown Whittier. Industrial uses are found on the western section of the City along Whittier Boulevard. Public and institutional uses include schools, parks, libraries, hospitals, the Civic Center, and the landfill. The pattern of development in the City reflects a time predating the automobile.

The population of the City of Whittier has shown modest growth during the past few decades and, in fact, much of the growth has resulted from the expansion of the City boundaries (i.e. annexation).



Future development in Whittier must be sensitive to the presence of the Whittier fault on the northeastern section of the City. Also, very little land remains undeveloped, except for the hillside areas. Other concerns on future development include the age and capacity of existing infrastructure (water lines, sewer lines, storm drainage, etc.) to handle additional loads. The City is continuously upgrading infrastructure facilities to meet current demands.

The City seeks to maintain the character of existing residential neighborhoods and to revitalize underutilized commercial and industrial uses. A healthy balance of land uses can promote land use compatibility, economic development and the need for quality development.

The Puente Hills is a major concern for residents. Most of the hills are outside the City's corporate boundaries, but within the City's sphere of influence. The Hills provide aesthetic, safety, ecological and open space values to the City. The City desires to actively participate in future planning efforts for the Hills and to explore ways to preserve them.

The City's sphere of influence includes areas which represent opportunities for joint planning. These opportunities include the Puente Hills, the Los Nietos community and adjacent unincorporated county areas. The City will continue to explore its options in annexing the areas within its designated sphere of influence. (Source: City of Whittier General Plan Land Use Element)

In the City of Whittier the demand for housing outstrips the available supply, and the recent low interest rates have further fueled a pent up demand. Currently there are 28,526 housing units in the City of Whittier. There are 18,483 single family homes (64.8% of available housing units) currently available. As for multiple unit homes, they account for 35.2 % of the total existing housing units at 10,133, units. There are 15,525 owner occupied units in the City of Whittier and 11,679 renter occupied units. Approximately 42.9% of the units are being rented in Whittier and 57.1% of the units are owned. The median value of home prices decreased from \$512,400 in 2010 to \$418,500 in 2013.

Employment and Industry

According to the 2013 Census, Management (35.2%), sales and office occupations (29.8%), as well as production, transportation, and material moving (12.3%) are City of Whittier's principal employment activities. Educational, health and social services (23.1%), manufacturing (11%), and retail trade (12.1%) make up the major industries in the City of Whittier. The City of Whittier has a labor force of 43,259 persons, about 0.85% of the countywide workforce.

Mitigation activities are needed at the business level to ensure the safety and welfare of workers and limit damage to industrial infrastructure. Employees are highly mobile, commuting from surrounding areas to industrial and business centers. This creates a greater dependency on roads, communications, accessibility and emergency plans to reunite people with their families. Before a hazard event, large and small businesses can develop strategies to prepare for hazards, respond efficiently, and prevent loss of life and property.

Transportation and Commuting Patterns

Private automobiles are the dominant means of transportation in Southern California and in the City of Whittier. According to the City's General Plan, the City of Whittier meets its public



transportation needs through dial-a-ride, Whittier Transit fixed route system, links to light rail transit, and MTA buses. MTA provides bus and service to the City of Whittier and to the Los Angeles County metropolitan area. Montebello Transit and Norwalk Transit provide Whittier residents with transportation to nearby Metrolink stations in Montebello and Norwalk. In addition to these services, the City promotes alternative transportation activities including carpools and park-and-ride.

According to the 2010 Census, the City has a population of 85,000 and a daytime population estimated at around 86,000. The mean travel time to work for the residents of the City of Whittier age 16 years+ is 29.8 minutes. There are 592,000 vehicle trips per day in the entire City of Whittier. Approximately 56% of this is residential use and 44% generated primarily by non-residential uses.

According to the General Plan, the City of Whittier is served by Whittier Boulevard (State Highway 72) and 605, connecting the city to adjoining parts of Los Angeles County. The City's 198 mile road system includes 41 miles of arterial highways and 157 miles of local roads, and 15 "bridges," as defined by Los Angeles County. As daily transit rises, there is an increased risk that a natural hazard event will disrupt the travel plans of residents across the region, as well as local, regional and national commercial traffic.

Localized flooding can render roads unusable. A severe winter storm has the potential to disrupt the daily driving routine of hundreds of thousands of people. Natural hazards can disrupt automobile traffic and shut down local and regional transit systems.





Part II: HAZARD ANALYSIS

Section 3: Risk Assessment

What is a Risk Assessment?

Conducting a risk assessment can provide information regarding: the location of hazards; the value of existing land and property in hazard locations; and an analysis of risk to life, property, and the environment that may result from natural hazard events. Specifically, the five levels of a risk assessment are as follows:

1. *Hazard Identification*
2. *Profiling Hazard Events*
3. *Vulnerability Assessment/Inventory of Existing Assets*
4. *Risk Analysis*
5. *Assessing Vulnerability/Analyzing Development Trends*

1) *Hazard Identification*

This section is the description of the geographic extent, potential intensity, and the probability of occurrence of a given hazard. Maps are used in this plan to display hazard identification data. The City of Whittier identified a wide range of natural hazards including: earthquakes, floods, wildfires, landslides, windstorms, drought, infestations, and dam failures. The Planning Team reviewed existing documents to determine which of these hazards posed the most significant threat to the City. In other words, which hazard would likely result in a local declaration of emergency.

The geographic extent of each of the identified hazards was identified by the Planning Team utilizing maps and data contained in the City's General Plan (including the Background Report and Housing Element) and City's Emergency Operations Plan. In addition, numerous internet resources and the County of Los Angeles Hazard Mitigation Plan served as valuable resources. Utilizing the Calculated Priority Risk Index (CPRI) ranking technique, the Planning Team concluded that five of the identified hazards posed a significant threat against the City: earthquakes, floods, wildfires, and drought. The hazard ranking system is described in Table: Calculated Priority Risk Index, while the actual ranking is shown in Table: Calculated Priority Risk Index Ranking for City of Whittier.



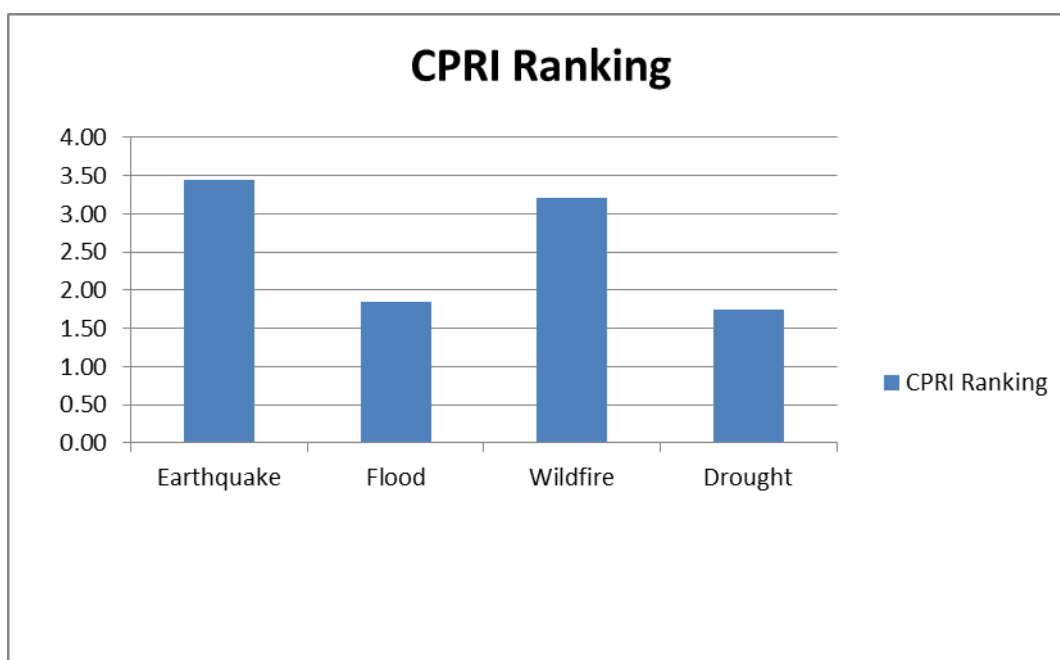
Table: Calculated Priority Risk Index
(Source: Federal Emergency Management Agency)

CPRI Category	Degree of Risk			Assigned Weighting Factor
	Level ID	Description	Index Value	
Probability	Unlikely	Extremely rare with no documented history of occurrences or events. Annual probability of less than 1 in 1,000 years.	1	45%
	Possibly	Rare occurrences. Annual probability of between 1 in 100 years and 1 in 1,000 years.	2	
	Likely	Occasional occurrences with at least 2 or more documented historic events. Annual probability of between 1 in 10 years and 1 in 100 years.	3	
	Highly Likely	Frequent events with a well-documented history of occurrence. Annual probability of greater than 1 every year.	4	
Magnitude/Severity	Negligible	Negligible property damages (less than 5% of critical and non-critical facilities and infrastructure. Injuries or illnesses are treatable with first aid and there are no deaths. Negligible loss of quality of life. Shut down of critical public facilities for less than 24 hours.	1	30%
	Limited	Slight property damage (greater than 5% and less than 25% of critical and non-critical facilities and infrastructure). Injuries or illnesses do not result in permanent disability, and there are no deaths. Moderate loss of quality of life. Shut down of critical public facilities for more than 1 day and less than 1 week.	2	
	Critical	Moderate property damage (greater than 25% and less than 50% of critical and non-critical facilities and infrastructure). Injuries or illnesses result in permanent disability and at least 1 death. Shut down of critical public facilities for more than 1 week and less than 1 month.	3	
	Catastrophic	Severe property damage (greater than 50% of critical and non-critical facilities and infrastructure). Injuries and illnesses result in permanent disability and multiple deaths. Shut down of critical public facilities for more than 1 month.	4	
Warning Time	> 24 hours	Population will receive greater than 24 hours of warning.	1	15%
	12-24 hours	Population will receive between 12-24 hours of warning.	2	
	6-12 hours	Population will receive between 6-12 hours of warning.	3	
	< 6 hours	Population will receive less than 6 hours of warning.	4	
Duration	< 6 hours	Disaster event will last less than 6 hours	1	10%
	< 24 hours	Disaster event will last less than 6-24 hours	2	
	< 1 week	Disaster event will last between 24 hours and 1 week.	3	
	> 1 week	Disaster event will last more than 1 week	4	



Table: Calculated Priority Risk Index Ranking for City of Whittier

Hazard	Probability	Weighted 45% (x.45)	Magnitude Severity	Weighted 30% (x.3)	Warning Time	Weighted 15% (x.15)	Duration	Weighted 10% (x.1)	CPRI Totals
Earthquake (Whittier/Puente Hills Fault)	3	1.35	4	1.2	4	0.6	3	0.3	3.45
Flood (Turnbull Canyon, Creek Canyon)	2	0.9	1	0.3	3	0.45	2	0.2	1.85
Wildfire (Turnbull Canyon, Creek Canyon)	4	1.8	2	0.6	4	0.6	2	0.2	3.20
Drought	4	1.8	1	0.3	1	0.15	4	0.4	2.65



2) Profiling Hazard Events

This process describes the causes and characteristics of each hazard and what part of the City's facilities, infrastructure, and environment may be vulnerable to each specific hazard. A profile of each hazard discussed in this plan is provided in the Hazard-Specific Analysis (Sections 4-7). Table: Vulnerability: Location, Extent, and Probability for City of Whittier indicates a generalized perspective of the community's vulnerability of the various hazards according to extent (or degree), location, and probability.



Table: Vulnerability: Location, Extent, and Probability for City of Whittier*†

Hazard	Location (Where)	Extent (How Big an Event)	Probability (How Often)*
Earthquake	Entire Project Area	The Southern California Earthquake Center (SCEC) in 2007 concluded that there is a 99.7 % probability that an earthquake of M6.7 or greater will hit California within 30 years. ¹	Moderate
Flood	Turnbull Canyon, Creek Canyon	Riverine Flooding: 100-year floodplain (Zone A)	Moderate
Wildfire	Northern Project Area	CALFIRE FRAP Rating is "Very High"	Moderate
Drought	Entire Project Area	Residential, Commercial, Industrial, and Institutional Water Conservation	High
* Probability is defined as: Low = 1:1,000 years, Moderate = 1:100 years, High = 1:10 years			
¹ Uniform California Earthquake Rupture Forecast			

3) Vulnerability Assessment/Inventory of Existing Assets

This is a combination of hazard identification with an inventory of the existing (or planned) property development(s) and population(s) exposed to a hazard. Critical facilities are of particular concern because these locations provide essential equipment or provide services to the general public that are necessary to preserve important public safety, emergency response, and/or disaster recovery functions. The critical facilities have been identified and are illustrated in Table: City of Whittier Critical Facilities Vulnerable to Hazards.

4) Risk Analysis

Estimating potential losses involves assessing the damage, injuries, and financial costs likely to be sustained in a geographic area over a given period of time. This level of analysis involves using mathematical models. The two measurable components of risk analysis are magnitude of the harm that may result and the likelihood of the harm occurring. Describing vulnerability in terms of dollar losses provides the community and the state with a common framework in which to measure the effects of hazards on assets. For each hazard where data was available, quantitative estimates for potential losses have been included in the hazard assessment. Data was not available to make vulnerability determinations in terms of dollar losses for all of the identified hazards. The Mitigation Actions Matrix (Section 8: Mitigation Strategies) includes an action item to conduct such an assessment in the future.

* ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT B1
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))
† ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT B2
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))



5) Assessing Vulnerability/ Analyzing Development Trends

This step provides a general description of City facilities and contents in relation to the identified hazards so that mitigation options can be considered in land use planning and future land use decisions. This Mitigation Plan provides comprehensive description of the character of the City in Section 2: Community Profile. This description includes the geography and environment, population and demographics, land use and development, housing and community development, employment and industry, and transportation and commuting patterns. Analyzing these components of the City can help in identifying potential problem areas and can serve as a guide for incorporating the goals and ideas contained in this mitigation plan into other community development plans.

Hazard assessments are subject to the availability of hazard-specific data. Gathering data for a hazard assessment requires a commitment of resources on the part of participating organizations and agencies. Each hazard-specific section of the plan includes a section on hazard identification using data and information from city, county, state, or federal sources.

Regardless of the data available for hazard assessments, there are numerous strategies the City can take to reduce risk. These strategies are described in the action items detailed in the Mitigation Actions Matrix (Section 8: Mitigation Strategies). Mitigation strategies can further reduce disruption to critical services, reduce the risk to human life, and alleviate damage to personal and public property and infrastructure.

Critical and Essential Facilities

Facilities critical to government response activities (i.e., life safety and property and environmental protection) include: local government 9-1-1 dispatch centers, local government emergency operations centers, local police and fire stations, local public works facilities, local communications centers, schools (shelters), and hospitals. Also, facilities that, if damaged, could cause serious secondary impacts are also considered "critical". A hazardous materials facility is one example of this type of critical facility.

Essential facilities are those facilities that are vital to the continued delivery of key City services or that may significantly impact the City's ability to recover from the disaster. These facilities include but are not limited to: schools (hosting shelters); buildings such as the jail, law enforcement center, public services building, community corrections center, the courthouse, and juvenile services building and other public facilities.

Table: Critical Facilities Vulnerable to Hazards illustrates the critical facilities within the City of Whittier and the vulnerability of those facilities to the identified hazards.



Table: Critical Facilities Vulnerable to Hazards

Name of Facility	Earthquake	Flood	Wildfire	Drought
City Hall 13230 Penn Street	X		X	X
Whittier Police Department 7315 Painter Avenue	X		X	X
City Yard 12016 Hadley Street	X	X		X
County of Los Angeles Fire Department - Station #17 12006 Hadley Street	X	X		X
County of Los Angeles Fire Department - Station #28 7733 Greenleaf Avenue	X			X
County of Los Angeles Fire Department - Station #59 10021 Scott Avenue	X			X
Presbyterian Intercommunity Hospital 12401 Washington Boulevard	X			X
Whittier Hospital Medical Center 9080 Colima Road	X		X	X

Land and Development

Development in Southern California from the earliest days was a cycle of boom and bust. The Second World War however dramatically changed that cycle. Military personnel and defense workers came to Southern California to fill the logistical needs created by the war effort. The available housing was rapidly exhausted and existing commercial centers proved inadequate for the influx of people. Immediately after the war, construction began on the freeway system, and the face of Southern California was forever changed. Home developments and shopping centers sprung up everywhere and within a few decades the urbanized portions of Southern California were virtually built out. This pushed new development further and further away from the urban center.

The City's General Plan provides the framework for the growth and development of the City, including, the use and development of private land, including residential, industrial and commercial areas, as demonstrated in the image below. This Plan is one of the City's most important tools in addressing environmental challenges including transportation and air quality; growth management; conservation of natural resources; clean water and open spaces.

The environment of most Los Angeles County cities is nearly identical with that of their immediate neighbors and the transition from one incorporated municipality to another is



seamless to most people. Consequently, many Los Angeles County communities are at-risk for the same natural hazards.

Impacts to Types of Structures

The City's General Plan identifies a broad range of land uses and the Building Code identifies several building types. In general terms, structures are categorized as residential, commercial, institutional, or public.

Table: Impacts to Existing and Future Types of Structures in the City of Whittier
(Source: EPC analysis based on City of Whittier General Plan – Land Use Map)

Category of Structure	Earthquake	Flood	Wildfire	Drought
Single-Family Residential	X	X	X	X
Multi-Family Residential	X	X	X	X
Commercial	X	X	X	X
Institutional	X	X	X	X
Manufacturing	X	X		X
Educational Institutions	X	X	X	X
Uptown Whittier Historical Buildings	X	X	X	X

*Changes in Development**

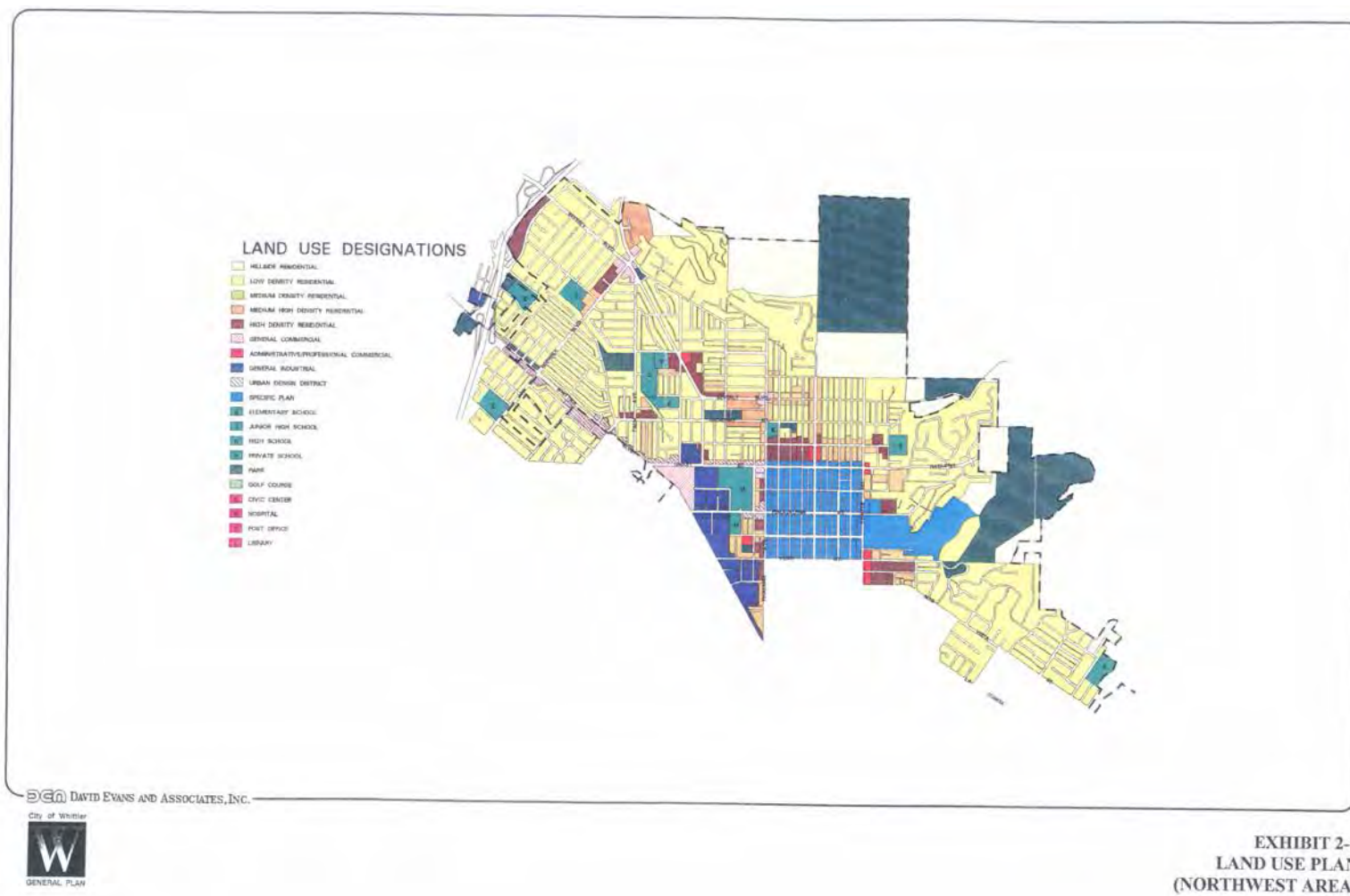
Since the adoption of the 2010 Plan, there have been no significant alterations to the development pattern of the City in the hazard prone areas. This conclusion was reached after a thorough review of the General Plan and discussion with the Planning Team.

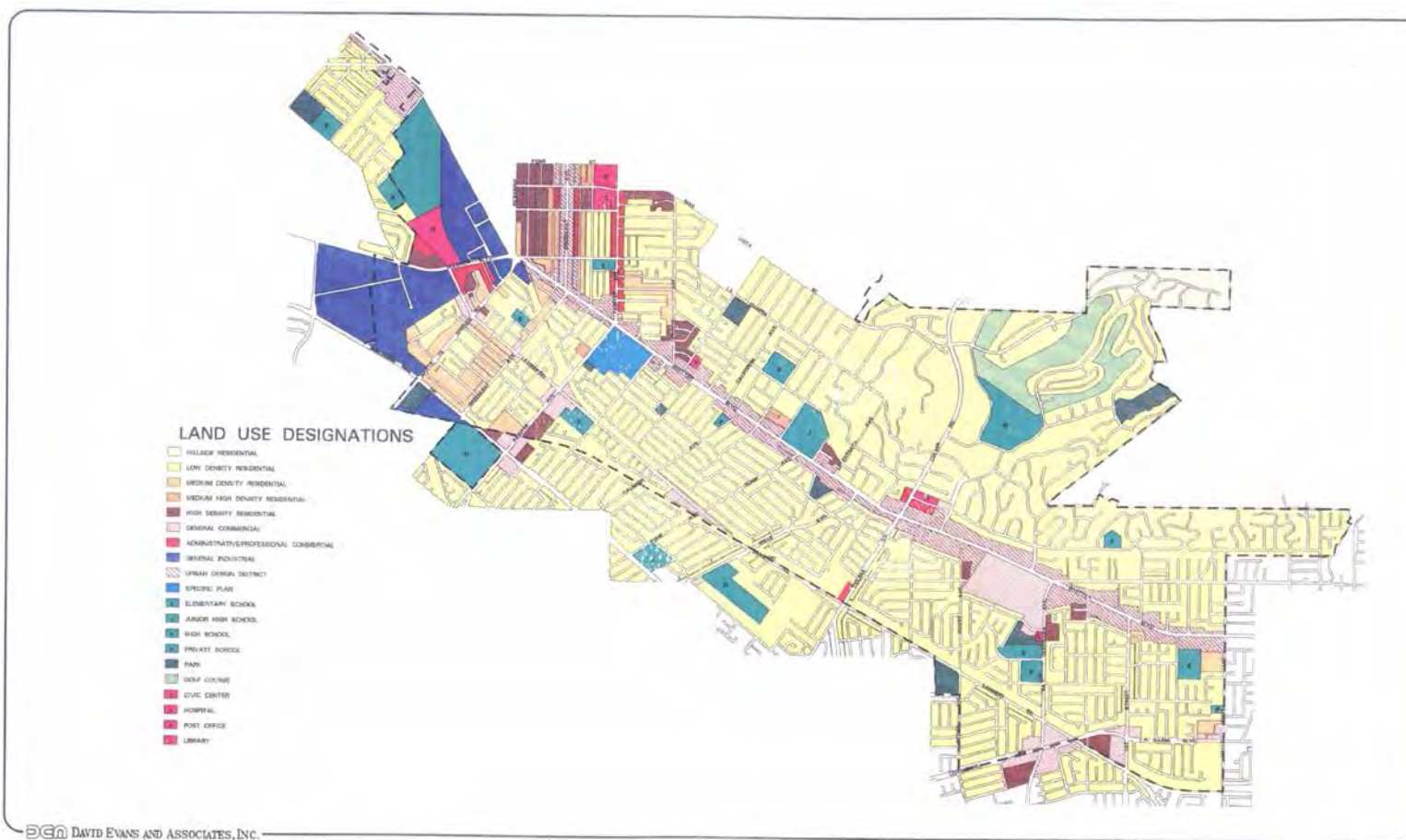
*** ELEMENT D. MITIGATION STRATEGY | D1**

D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))



Map: Land Use Plan Maps
(Source: City of Whittier General Plan 1993)





DEA DAVID EVANS AND ASSOCIATES, INC.



EXHIBIT 2-2
LAND USE PLAN
(SOUTHEAST AREA)



Integration with the General Plan

The goals and policies of the Public Safety Element respond to the different safety concerns that are present in the City. The policies established by the City are grouped together under five specific goals. These goals address overall protection from hazards, the provision of adequate safety services, protection from seismic hazards and the regulation of hazardous materials use and disposal. They are intended to prevent hazardous conditions, to protect residents from harm, and to prepare the City for unavoidable disasters.

Issue: Protection from Hazards

The protection of life and property from hazards is the major objective of the following goal and supporting policies. Future planning that takes into account the natural and manmade hazards in the City, will improve the level of safety for all residents.

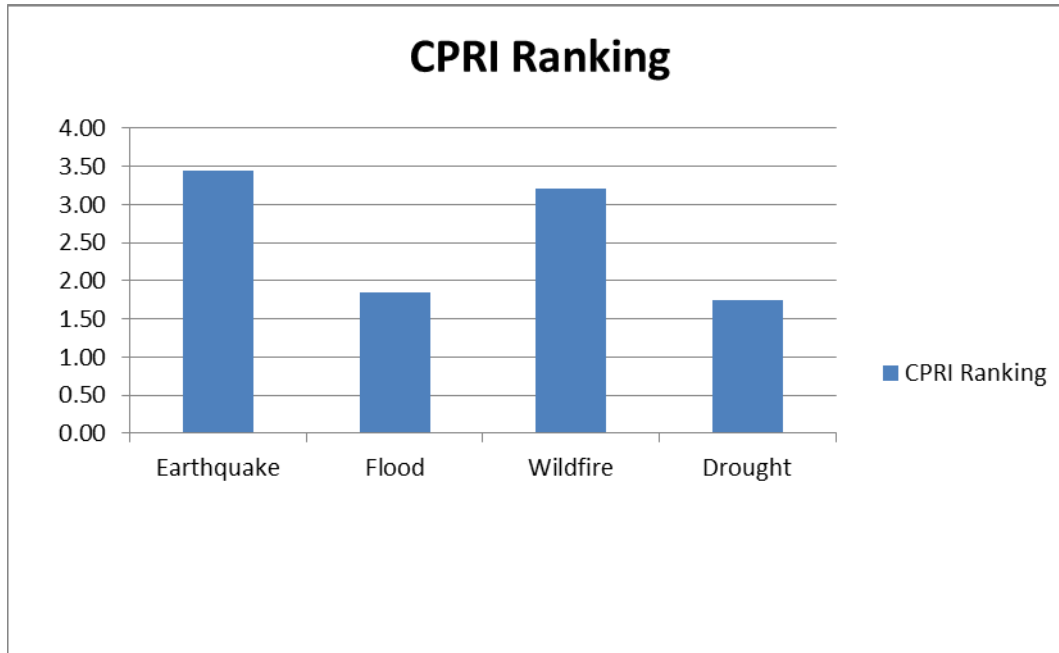
Promote an environment that is reasonably safe from hazards so that Whittier residents may conduct their daily lives free from fear and apprehension.

- Policy 1.1 Continue to work for the highest quality of fire, police, and health protection possible for all Whittier residents.
- Policy 1.2 Continue to cooperate with public agencies and support service providers to develop emergency preparedness programs to reduce injury, loss of life, and property damage.
- Policy 1.3 Continue to provide fast, efficient, and reliable assistance to disaster victims and to areas where conditions warrant evacuation of people and property.
- Policy 1.4 Promote emergency preparedness through public education and awareness programs on safety, earthquake preparedness, crime prevention, and fire and hazard prevention.
- Policy 1.5 Promote the study, adoption, and review of regulations designed to assure appropriate and safe development in hazardous areas.

Summary

Natural hazard mitigation strategies can reduce the impacts concentrated at large employment and industrial centers, public infrastructure, and critical facilities. Hazard mitigation for industries and employers may include developing relationships with emergency management services and their employees before disaster strikes, and establishing mitigation strategies together. Collaboration among the public and private sector to create mitigation plans and actions can reduce the impacts of hazards.

Section 4: Earthquake Hazards



Previous Occurrences of Earthquakes in the City of Whittier*



Photo: Collapse of wall of second story of Art's Jewelry and Loan establishment on Greenleaf Avenue in "Uptown" Whittier
(Source: NOAA)

* ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2

B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))



The most significant earthquake event affecting Whittier was the October 1, 1987 Whittier Narrows Earthquake (Magnitude 6.1, which was later downgraded to 5.9), and the October 4, 1987 aftershock (Magnitude 5.5). The earthquake caused 8 deaths (not in Whittier) and extensive property damage, especially to older residential and commercial buildings. The damaged Uptown section of Whittier, with many unreinforced masonry buildings, was by far the area hardest hit. At least 200 residences and 30 businesses were badly damaged and most of the severe damage was to structures built before 1930.

However, the earthquakes both occurred either early in the morning or on a Sunday. This considerably reduced the potential effects. Many damaged buildings and streets were unoccupied, and most businesses were not yet open.

Photo: Partial collapse of parking garage and store
(Source: NOAA)



The earthquakes caused an estimated \$358 million in property damage. Los Angeles County reports estimate that both earthquakes damaged over 9,100 residential and business structures throughout the county. Houses in Whittier were partially shaken from their foundations and countless chimneys were damaged. In Uptown Whittier, falling walls and bricks damaged many parked automobiles. Severe structural cracks within the foundation of the nearby interchange of Interstate Highways 5 and 605 caused CalTrans officials to close the interchange for the day for temporary repairs. Small landslides could be observed in Turnbull Canyon in northern Whittier. Fortunately, the terrain was much too dry for the ground shaking to have activated deep-seated landslides. Dust clouds rose over the southern flank of the San Gabriel Mountains caused by rock falls and surface land sliding from road cuts.



These were the first damaging earthquakes to occur in the Los Angeles area since the 1971 San Fernando Earthquake (Magnitude 6.4). The next most recent significant earthquake affecting southern California was the January 1, 1994 Northridge Earthquake (Magnitude 6.7). Fifty-seven people were killed and more than 1,500 people were seriously injured. Approximately 15,000 structures were moderately to severely damaged, which left thousands of people temporarily homeless. Several collapsed bridges and overpasses created commuter havoc on the freeway system. The Northridge Earthquake resulted in record economic losses.

Historical and geological records show that California has a long history of seismic events. Southern California is probably best known for the San Andreas Fault, a 400 mile long fault running from the Mexican border to a point offshore, west of San Francisco. "Geologic studies show that over the past 1,400 to 1,500 years large earthquakes have occurred at about 130 year intervals on the Southern San Andreas Fault. As the last large earthquake on the Southern San Andreas occurred in 1857, that section of the fault is considered a likely location for an earthquake within the next few decades."

The San Andreas is only one of dozens of known earthquake faults that crisscross Southern California. Some of the better known faults include the Newport-Inglewood, Whittier, Chatsworth, Elsinore, Hollywood, Los Alamitos, Puente Hills, and Palos Verdes Faults. Beyond the known faults, there are a potentially large number of "blind" faults that underlie the surface of Southern California. One such blind fault was involved in the October 1987 Whittier Narrows Earthquake.

Although the most famous of the faults, the San Andreas, is capable of producing an earthquake with a moment magnitude of greater than 8, some of the "lesser" faults have the potential to inflict greater damage on the urban core of Southern California.

Tremendous earthquake mapping and mitigation efforts have been made in California in the past two decades, and public awareness has risen remarkably during this time. Major federal, state, and local government agencies and private organizations support earthquake risk reduction, and have made significant contributions in reducing the adverse impacts of earthquakes. Despite the progress, the majority of California communities remain unprepared because there is a general lack of understanding regarding earthquake hazards among Californians.

Earthquake Characteristics

A recent Southern California Earthquake Center (SCEC) report (SCEC, 1995) indicated that the probability of an earthquake of Magnitude 7 or larger in southern California before the year 2024 is 80 to 90%. A significant earthquake along one of the major faults could cause substantial casualties, extensive damage to buildings, roads and bridges, fires, and other threats to life and property. The effects could be aggravated by aftershocks and by secondary effects such as fire, landslides and dam failure. A major earthquake could be catastrophic in its effect on the population, and could exceed the response capability of the local communities and even the State.

Following major earthquakes, extensive search and rescue operations may be required to assist trapped or injured persons. Emergency medical care, food and temporary shelter would be required for injured or displaced persons. In the event of a truly catastrophic earthquake,



identification and burial of the dead would pose difficult problems. Mass evacuation may be essential to save lives, particularly in areas below dams. Many families could be separated, particularly if the earthquake should occur during working hours, and a personal inquiry or locator system would be essential to maintain morale.

Emergency operations could be seriously hampered by the loss of communications and damage to transportation routes within, and to and from, the disaster area and by the disruption of public utilities and services.

Extensive federal assistance could be required and could continue for an extended period. Efforts would be required to remove debris and clear roadways, demolish unsafe structures, assist in reestablishing public services and utilities, and provide continuing care and welfare for the affected population, including temporary housing for displaced persons.

In general, the population is less at risk during non-work hours (if at home) as wood-frame structures are relatively less vulnerable to major structural damage than are typical commercial and industrial buildings. Transportation problems are intensified if an earthquake occurs during work hours, as significant numbers of employees would be stranded in the City. An earthquake occurring during work hours would clearly create major transportation problems for those displaced workers.

Regulatory Background

The State regulates development within California to reduce or mitigate potential hazards from earthquakes or other geologic hazards. Development in potentially seismically active areas is also governed by the Alquist-Priolo Earthquake Fault Zoning Act and the Seismic Hazards Mapping Act.

Chapter 16A, Division IV of the California Building Code (CBC), titled "Earthquake Design," states that "The purpose of the earthquake provisions herein is primarily to safeguard against major structural failures or loss of life." The CBC and the Uniform Building Code (UBC) regulate the design and construction of excavations, foundations, building frames, retaining walls, and other building elements to mitigate the effects of seismic shaking and adverse soil conditions. The procedures and limitations for the design of structures are based on site characteristics, occupancy type, configuration, structural system, height, and seismic zonation. Seismic zones are mapped areas (Figure 16A-2 of the CBC and Figure 16-2 of the UBC) that are based on proximity to known active faults and the potential for future earthquakes and intensity of seismic shaking. Seismic zones range from 0 to 4, with areas mapped as Zone 4 being potentially subject to the highest accelerations due to seismic shaking and the shortest recurrence intervals. The City of Whittier is located within Seismic Zone 4.

Historical Events in Los Angeles County

Southern California has a history of powerful and relatively frequent earthquakes, dating back to the powerful magnitude 8.0+ 1857 San Andreas Earthquake which did substantial damage to the relatively few buildings that existed at the time.

Paleoseismological research indicates that large magnitude (8.0+) earthquakes occur on the San Andreas Fault at intervals between 45 and 332 years with an average interval of 140 years.



Other lesser faults have also caused very damaging earthquakes since 1857. Notable earthquakes include the 1933 Long Beach Earthquake, the 1971 San Fernando Earthquake, the 1987 Whittier Earthquake and the 1994 Northridge Earthquake.

The most recent significant earthquake event affecting Southern California was the January 17th 1994 Northridge Earthquake. At 4:31 A.M. on Monday, January 17th, a moderate but very damaging earthquake with a magnitude of 6.7 struck the San Fernando Valley. In the following days and weeks, thousands of aftershocks occurred, causing additional damage to affected structures.

Fifty-seven people were killed and more than 1,500 people seriously injured. For days afterward, thousands of homes and businesses were without electricity; tens of thousands had no gas; and nearly 50,000 had little or no water. Approximately 15,000 structures were moderately to severely damaged, which left thousands of people temporarily homeless; 66,500 buildings were inspected. Nearly 4,000 were severely damaged and over 11,000 were moderately damaged. Several collapsed bridges and overpasses created commuter havoc on the freeway system. Extensive damage was caused by ground shaking, but earthquake triggered liquefaction and dozens of fires also caused additional severe damage. This extremely strong ground motion in large portions of Los Angeles County resulted in record economic losses.

Since seismologists started recording and measuring earthquakes, there have been tens of thousands of recorded earthquakes in Los Angeles County, most with a magnitude below three. No community in Los Angeles County is beyond the reach of a damaging earthquake. Table: 4-2: Earthquake Events in the Los Angeles County describes the historical earthquake events that have affected Los Angeles County. Based on a search of earthquake databases of the United States Geological Survey (USGS) - National Earthquake Information Center (NEIC), several major earthquakes (Magnitude 6.0 or more) have been recorded within approximately 100 kilometers of the project area since 1769.

Table: Earthquake Events in Los Angeles County (Magnitude 5.0 or Greater)
(Source: <http://www.usgs.gov/>)

1769	Los Angeles Basin	1910	Glen Ivy Hot Springs
1812	Wrightwood	1987	Whittier Narrows
1827	Los Angeles Region	1992	Landers
1855	Los Angeles Region	1994	Northridge
1893	Pico Canyon	2005	Southern California

Faults are prevalent throughout California and are commonly classified as either “active” or “potentially active.” An active fault is a break that has moved in recent geologic time (the last 11,000 years) and that is likely to move within the next approximately 100 years. Active faults are the primary focus of concern in attempting to prevent earthquake hazards. A potentially active fault is one that has shifted but not in the recent geologic period (or, between 11,000 and 3,000,000 years ago) and is therefore considered dormant or unlikely to move in the future. Several active faults have been identified within or adjacent to the boundaries of the Whittier planning area, which, most importantly, indicates that the community falls under the State Earthquake Fault Zoning Act and the State Hazards Mapping Act. These Acts basically require



that local governments, in the general plan update process, adopt policies and criteria to ensure the structural adequacy of buildings erected across active faults for human occupancy. In some cases, the development of structures must be prohibited. Verification that the above Acts pertain to Whittier was obtained through correspondence with the State Department of Conservation and is on file with the City's Planning Services Division.

According to the City's Background Report to the General Plan (1993), several seismic conditions (e.g. faults, thrust belts, deformations, etc.) are located nearby the City and capable of producing significant earthquakes. The Background Report explains that both location from the City and seismic activity of the fault (Richter Scale "maximum credible earthquake magnitude") are the two most important indicators of the potential threat from an active fault. The following table summarizes the various faults, distances from City Hall, and the maximum credible earthquake magnitude:

Fault	Distance from City Hall (Miles)	Maximum Credible EQ Magnitude (Richter Scale)
Elsinore Fault Zone	26	7.25
Elysian Park Fold and Thrust Belt	6	6.5
Newport-Inglewood Fault Zone	13	7.0
Palos Verdes Fault Zone	20	7.0
San Andreas Fault Zone	34	8.5
San Jacinto Fault Zone	43	7.5
Sierra Madre Fault System	20	7.0
Whittier Fault	1.2	7.0

Geologic evidence suggests that the San Andreas Fault has a 50 percent chance of producing a magnitude 7.5 to 8.5 quake (comparable to the great San Francisco earthquake of 1906) within the next 30 years. A significant earthquake originating along any of the identified faults could cause damage to buildings and infrastructure as well as injuries and fatalities throughout Whittier.

Additionally, it's common for seismic disturbances to trigger secondary effects or hazards associated with subsurface movement, such as ground shaking and ground failure, which are discussed later in this section.

In addition to the loss of production capabilities, the economic impact on the City from a major earthquake would be considerable in terms of loss of employment and loss of tax base. Also, a major earthquake could cause serious damage and/or outage to computer facilities. The loss of such facilities could curtail or seriously disrupt the operations of banks, insurance companies, and other elements of the financial community. In turn, this could affect the ability of local government, business and the population to make payments and purchases.



Measuring and Describing Earthquakes

An earthquake is a sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of the Earth's tectonic plates. The effects of an earthquake can be felt far beyond the site of its occurrence. They usually occur without warning and, after just a few seconds, can cause massive damage and extensive casualties. Common effects of earthquakes are ground motion and shaking, surface fault ruptures, and ground failure. Ground motion is the vibration or shaking of the ground during an earthquake. When a fault ruptures, seismic waves radiate, causing the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter. Soft soils can further amplify ground motions. The severity of these effects is dependent on the amount of energy released from the fault or epicenter. One way to express an earthquake's severity is to compare its acceleration to the normal acceleration due to gravity. The acceleration due to gravity is often called "g". A ground motion with a peak ground acceleration of 100%g is very severe. Peak Ground Acceleration (PGA) is a measure of the strength of ground motion. PGA is used to project the risk of damage from future earthquakes by showing earthquake ground motions that have a specified probability (10%, 5%, or 2%) of being exceeded in 50 years. These ground motion values are used for reference in construction design for earthquake resistance. The ground motion values can also be used to assess relative hazard between sites, when making economic and safety decisions.

When a fault ruptures, seismic waves radiate, causing the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter.	<p>Another tool used to describe earthquake intensity is the Magnitude Scale. The Magnitude Scale is sometimes referred to as the Richter Scale. The two are similar but not exactly the same. The Magnitude Scale was devised as a means of rating earthquake strength and is an indirect measure of seismic energy released. The Scale is logarithmic with each one-point increase corresponding to a 10-fold increase in the amplitude of the seismic shock waves generated by the earthquake. In terms of actual energy released, however, each one-point increase on the Richter scale corresponds to about a 32-fold increase in energy released. Therefore, a Magnitude 7 (M7) earthquake is 100 times (10×10) more powerful than a M5 earthquake and releases 1,024 times (32×32) the energy.</p> <p>An earthquake generates different types of seismic shock waves that travel outward from the focus or point of rupture on a fault. Seismic waves that travel through the earth's crust are called body waves and are divided into primary (P) and secondary (S) waves.</p>
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Because P waves move faster (1.7 times) than S waves, they arrive at the seismograph first. By measuring the time delay between arrival of the P and S waves and knowing the distance to the epicenter, seismologists can compute the magnitude for the earthquake.

The duration of an earthquake is related to its magnitude but not in a perfectly strict sense. There are two ways to think about the duration of an earthquake. The first is the length of time it takes for the fault to rupture and the second is the length of time shaking is felt at any given point (e.g. when someone says "I felt it shake for 10 seconds" they are making a statement about the duration of shaking). (Source: www.usgs.gov)

The Modified Mercalli Scale (MMI) is another means for rating earthquakes, but one that attempts to quantify intensity of ground shaking. Intensity under this scale is a function of distance from the epicenter (the closer to the epicenter the greater the intensity), ground acceleration, duration of ground shaking, and degree of structural damage. This rates the level of severity of an earthquake by the amount of damage and perceived shaking (Table: Modified Mercalli Intensity Scale).

Table: Modified Mercalli Intensity Scale

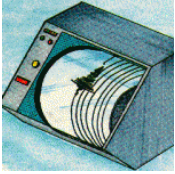






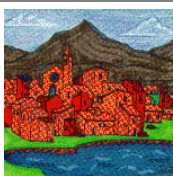
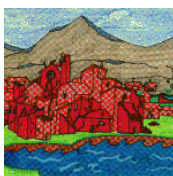


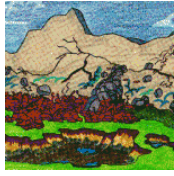
	MMI Value	Description of Shaking Severity	Summary Damage Description Used on 1995 Maps	Full Description
	I			Not Felt
	II			Felt by persons at rest, on upper floors, or favorably placed.
	III			Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
	IV			Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing motorcars rock. Windows, dishes, doors rattle. In the upper range of IV, wooden walls and frame creak.
	V	Light	Pictures Move	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clock stop, start, change rate.
	VI	Moderate	Objects Fall	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and masonry D cracked.

Table: Modified Mercalli Intensity Scale

	MMI Value	Description of Shaking Severity	Summary Damage Description Used on 1995 Maps	Full Description
	VII	Strong	Nonstructural Damage	Difficult to stand. Noticed by drivers of motorcars. Hanging objects quiver. Furniture broken. Damage to masonry, including cracks. Weak chimneys broken at roofline. Fall of plaster, loose bricks, stones, tiles, cornices. Some cracks in masonry C. Small slides and caving in along sand or gravel banks. Concrete irrigation ditches damaged.
	VIII	Very Strong	Moderate Damage	Steering of motorcars affected. Damage to masonry C, partial collapse. Some damage to masonry B; none to masonry A. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, and elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Cracks in wet ground and on steep slopes.
	IX	Violent	Heavy damage	General panic. Damage to masonry buildings ranges from collapse to serious damage unless modern design. Wood-frame structures rack, and, if not bolted, shifted off foundations. Underground pipes broken.
	X	Very Violent	Extreme Damage	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land.
	XI			Rails bent greatly. Underground pipelines completely out of services.
	XII			Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into air.



Impact of Earthquakes in the City of Whittier*

Based on the risk assessment, it is evident that earthquakes will continue to have potentially devastating economic impacts to certain areas of the city. Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life;
- ✓ Commercial and residential structural damage;
- ✓ Disruption of and damage to public infrastructure;
- ✓ Secondary health hazards e.g. mold and mildew;
- ✓ Damage to roads/bridges resulting in loss of mobility;
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community;
- ✓ Negative impact on commercial and residential property values; and
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.

Severity

A major earthquake occurring in or near Whittier could cause many deaths and injuries, extensive property damage, fires, hazardous material spills, and other dangers. Aftershocks and the secondary effects of fire, hazardous material/chemical accidents, and possible failure of dams and waterways could aggravate the situation.

The time of day and season of the year would have a profound impact on the number of dead and injured and the amount of property damage. Such an earthquake could exceed the response capabilities of the individual cities, Los Angeles County Operational Area, and the State of California Emergency Management Agency. Support of damage control and disaster relief could be required from other local governments and private organizations, as well as the state and federal governments.

A major earthquake could disrupt, damage, or destroy computer facilities, which could curtail the operations of banks, insurance companies, and other elements of the financial community for several days or weeks.

Extensive search and rescue operations could be required to assist trapped persons. Mass evacuation could be essential to save lives, particularly in areas downwind from hazardous material releases. Emergency medical care, food, and temporary shelter could be required by injured or displaced persons.

Many families could be separated, particularly if the earthquake occurs during working hours.

A personal inquiry or locator system could be essential to maintain morale. Emergency operations could be seriously hampered by a loss of communications, damage to transportation routes, and/or disruption of public utilities and services.

The economic impact on the City could be considerable in terms of lost employment and lost tax base. A major earthquake could disrupt, damage, or destroy

* ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))



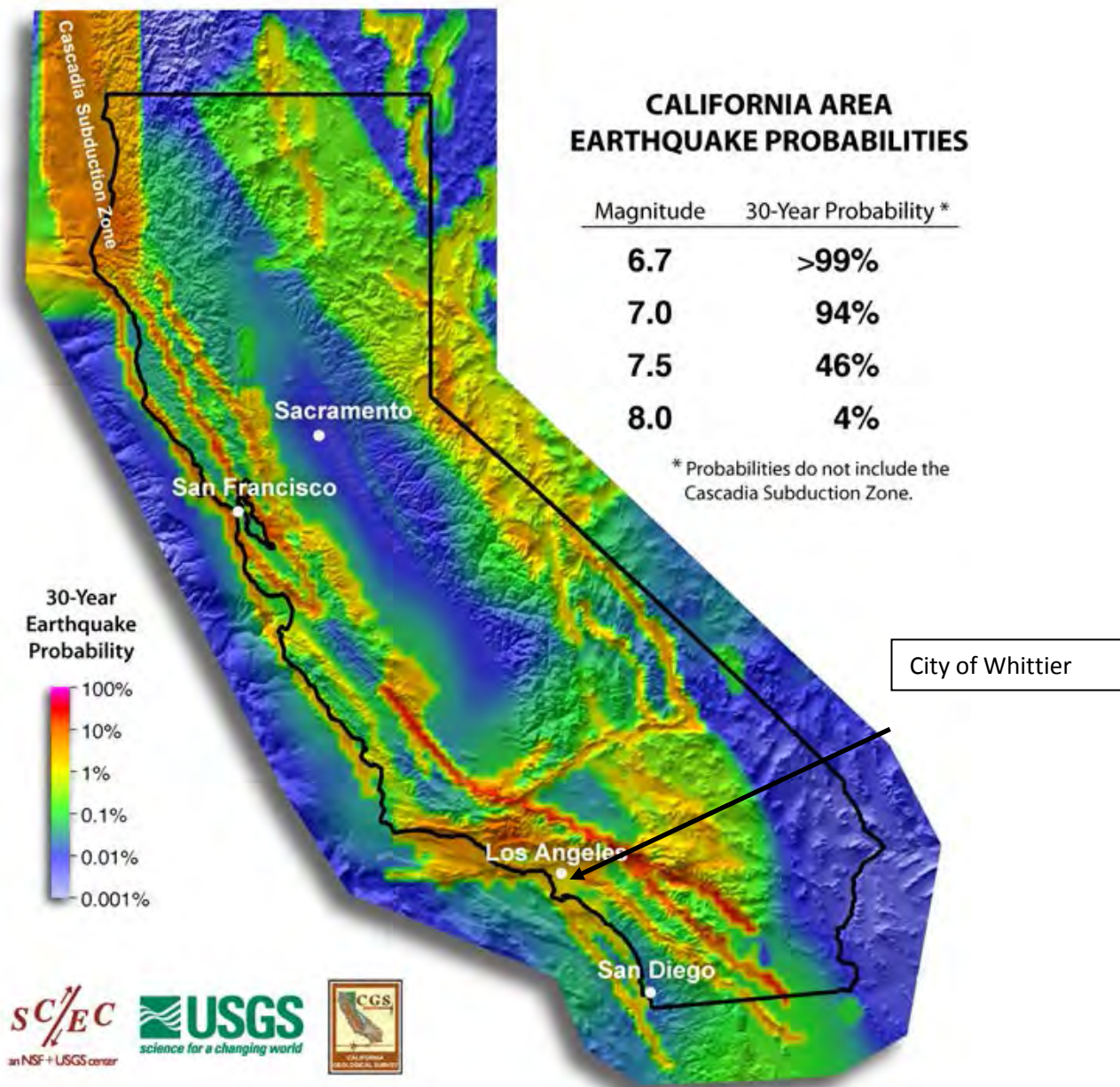
computer facilities, which could curtail the operations of banks, insurance companies, and other elements of the financial community for several days or weeks. This could affect the ability of local government, business, and residents to make payments and purchases. (Source: California Division of Mines and Geology, Special Publication 60, *Earthquake Planning Scenario for a Magnitude 8.3 Earthquake on the San Andreas Fault in Southern California*, 1982.)

Earthquake Hazard Assessment

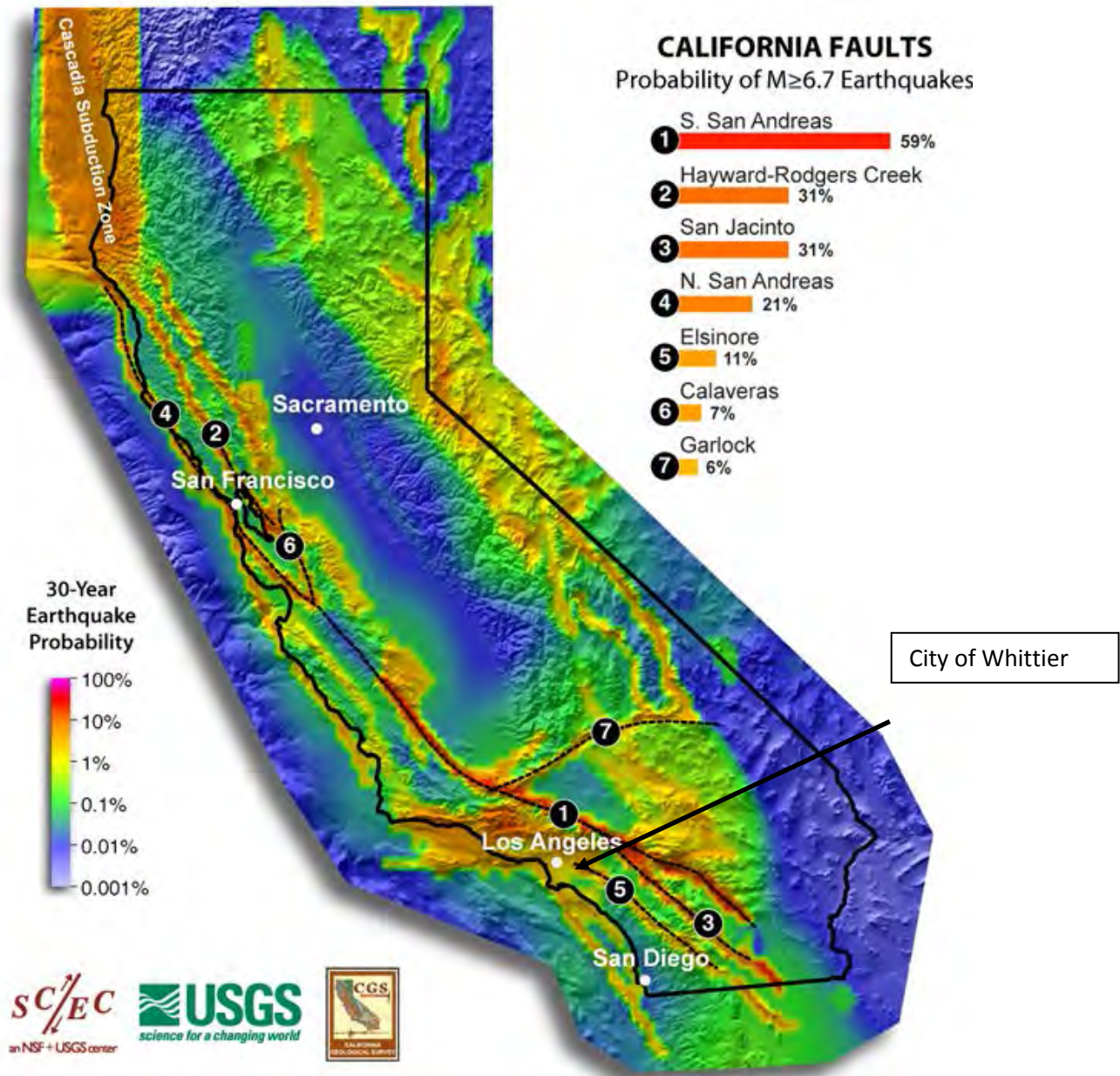
Hazard Identification

The 2007 Working Group on California Earthquake Probabilities (WGCEP 2007), a multi-disciplinary collaboration of scientists and engineers, has released the Uniform California Earthquake Rupture Forecast (UCERF), the first comprehensive framework for comparing earthquake possibilities throughout all of California. In developing the UCERF, the 2007 Working Group revised earlier forecasts for Southern California (WGCEP 1995) and the San Francisco Bay Area (WGCEP 2003) by incorporating new data on active faults and an improved scientific understanding of how faults rupture to produce large earthquakes. It extended the forecast across the entire state using a uniform methodology, allowing for the first time, meaningful comparisons of earthquake probabilities in urbanized areas such as Los Angeles and San Francisco Bay Area, as well as comparisons among the large faults in different parts of the State. The study was organized by the Southern California Earthquake Center, the U.S. Geological Survey, and the California Geological Survey, and it received major support from the California Earthquake Authority, which is responsible for setting earthquake insurance rates statewide. According to the new forecast, California has a 99.7% chance of having a magnitude 6.7 or larger earthquake during the next 30 years. The likelihood of an even more powerful quake of magnitude 7.5 or greater in the next 30 years is 46%.

Map: California Area Earthquake Probabilities
(Source www.sced.org/ucrf)



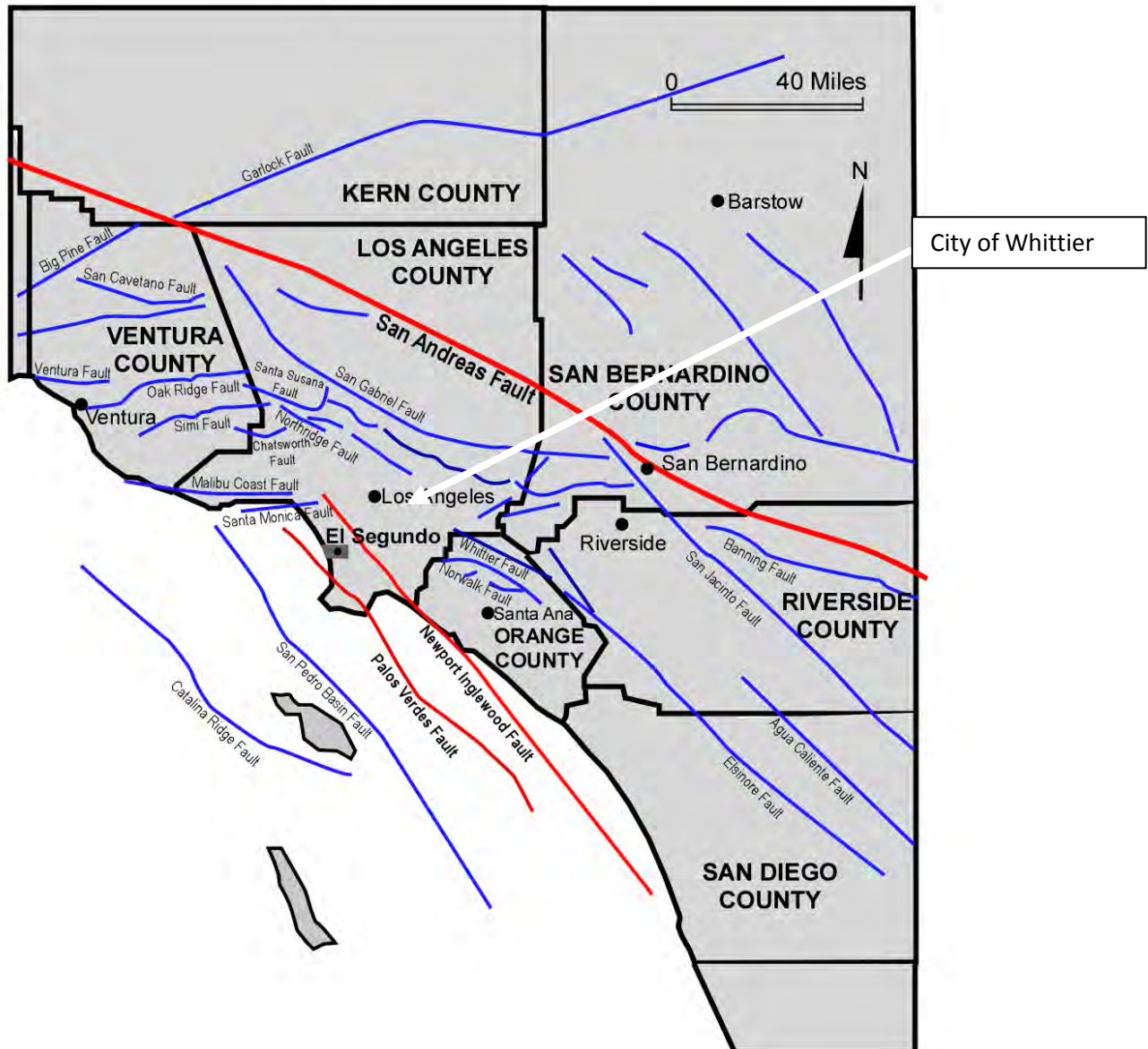
Map: California Faults
(Source www.scec.org/ucrf)





Map: Southern California Earthquake Fault Map

Southern California Earthquake Fault Map





Earthquake Probable Events

Following is a list of regional faults and associated data. (Source: Southern California Earthquake Data Center)

Elsinore Fault Zone

TYPE OF FAULTING: right-lateral strike-slip

LENGTH: about 180 km (not including the Whittier, Chino, and Laguna Salada Faults)

NEARBY COMMUNITIES: Temecula, Lake Elsinore, Julian

LAST MAJOR RUPTURE: May 15, 1910; Magnitude 6 -- no surface rupture found

SLIP RATE: roughly 4.0 mm/yr

INTERVAL BETWEEN MAJOR RUPTURES: roughly 250 years

PROBABLE MAGNITUDES: M6.5 - 7.5

MOST RECENT SURFACE RUPTURE: 18th century A.D.(?)

Newport-Inglewood Fault Zone

TYPE OF FAULTING: right-lateral; local reverse slip associated with fault steps

LENGTH: 75 km

NEAREST COMMUNITIES: Culver City, Inglewood, Gardena, Compton, Signal Hill, Long Beach, Seal Beach, Huntington Beach, Newport Beach, Costa Mesa

MOST RECENT MAJOR RUPTURE: March 10, 1933, MW6.4 (but no surface rupture)

SLIP RATE: 0.6 mm/yr

INTERVAL BETWEEN MAJOR RUPTURES: unknown

PROBABLE MAGNITUDES: M6.0 - 7.4

OTHER NOTES: Surface trace is discontinuous in the Los Angeles Basin, but the fault zone can easily be noted there by the existence of a chain of low hills extending from Culver City to Signal Hill. South of Signal Hill, it roughly parallels the coastline until just south of Newport Bay, where it heads offshore, and becomes the Newport-Inglewood - Rose Canyon Fault Zone.

Palos Verdes Fault Zone

TYPE OF FAULT: right-reverse (?)

LENGTH: roughly 80 km

NEARBY COMMUNITIES: San Pedro, Palos Verdes Estates, Torrance, Redondo Beach

MOST RECENT SURFACE RUPTURE: Holocene, offshore; Late Quaternary, onshore

SLIP RATE: between 0.1 and 3.0 mm/yr

INTERVAL BETWEEN MAJOR RUPTURES: unknown

PROBABLE MAGNITUDES: M6.0 - 7.0 (or greater?); fault geometries may allow only partial rupture at any one time

OTHER NOTES: Has two main branches (see below). Continues southward as the Palos Verdes - Coronado Bank Fault Zone.

San Andreas Fault Zone

TYPE OF FAULT: right-lateral strike-slip

LENGTH: 1200 km 550 km south from Parkfield; 650km northward

NEARBY COMMUNITY: Parkfield, Frazier Park, Palmdale, Wrightwood, San Bernardino, Banning, Indio

LAST MAJOR RUPTURE: January 9, 1857 (Mojave segment); April 18, 1906 (Northern segment)

SLIP RATE: about 20 to 35 mm per year

INTERVAL BETWEEN MAJOR RUPTURES: average of about 140 years on the Mojave



segment; recurrence interval varies greatly -- from under 20 years (at Parkfield only) to over 300 years

PROBABLE MAGNITUDES: M6.8 - 8.0

San Jacinto Fault Zone

TYPE OF FAULTING : right-lateral strike-slip; minor right-reverse

LENGTH: 210 km, including Coyote Creek Fault

NEARBY COMMUNITIES: Lytle Creek, San Bernardino, Loma Linda, San Jacinto, Hemet, Anza, Borrego Springs, Ocotillo Wells

MOST RECENT SURFACE RUPTURE: within the last few centuries; April 9, 1968, M6.5 on Coyote Creek segment

SLIP RATE: typically between 7 and 17 mm/yr

INTERVAL BETWEEN SURFACE RUPTURES: between 100 and 300 years, per segment

PROBABLE MAGNITUDES: M6.5 - 7.5

Sierra Madre Fault System

TYPE OF FAULTING: reverse

LENGTH: the zone is about 55 km long;

total length of main fault segments is about 75 km, with each segment measuring roughly 15 km long

NEARBY COMMUNITIES: Sunland, Altadena, Sierra Madre, Monrovia, Duarte, Glendora

MOST RECENT SURFACE RUPTURE: Holocene

SLIP RATE: between 0.36 and 4 mm/yr

INTERVAL BETWEEN SURFACE RUPTURES: several thousand years (?)

PROBABLE MAGNITUDES: M6.0 - 7.0 (?)

OTHER NOTES: This fault zone dips to the north. It was not the fault responsible for the 1991 Sierra Madre earthquake.

Whittier Fault

TYPE OF FAULTING: right-lateral strike-slip with some reverse slip

LENGTH: about 40 km

NEARBY COMMUNITIES: Yorba Linda, Hacienda Heights, Whittier

MOST RECENT SURFACE RUPTURE: Holocene

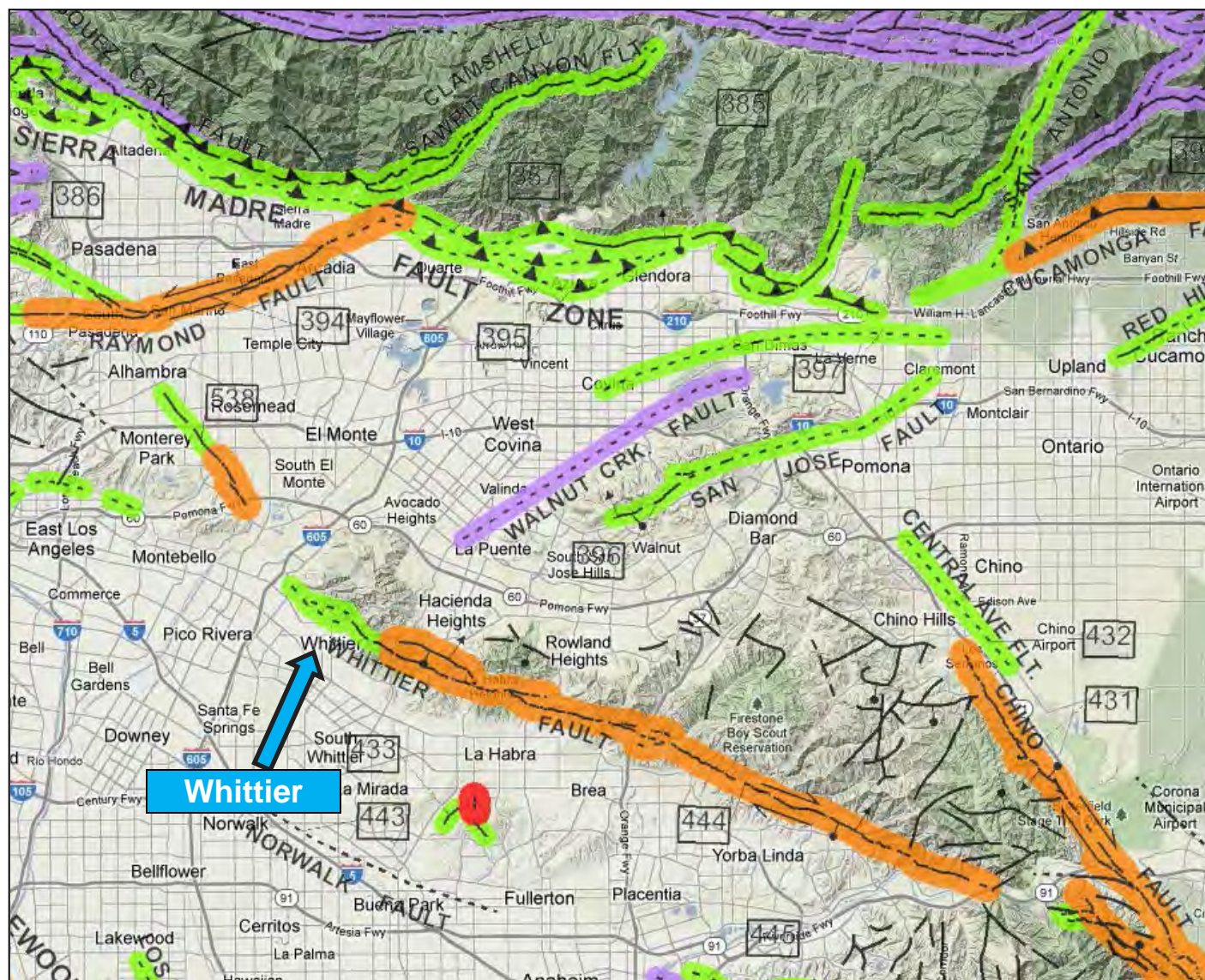
SLIP RATE: between 2.5 and 3.0 mm/yr

INTERVAL BETWEEN MAJOR RUPTURES: unknown

PROBABLE MAGNITUDES: M6.0 - 7.2

OTHER NOTES: The Whittier Fault dips toward the northeast.

Map: Regional Fault Map
(Source: State of California Department of Conservation)





Vulnerability Assessment

The effects of earthquakes span a large area, and large earthquakes occurring in many parts of the Southern California region would probably be felt throughout the region. However, the degree to which the earthquakes are felt, and the damages associated with them may vary. At risk from earthquake damage are large stocks of old buildings and bridges; many high tech and hazardous materials facilities; extensive sewer, water, and natural gas pipelines; earth dams; petroleum pipelines; and other critical facilities and private property located in the county. The relative or secondary earthquake hazards, which are liquefaction, ground shaking, amplification, and earthquake-induced landslides, are just as devastating as the earthquake.

Earthquake Related Hazards

Ground shaking, landslides, liquefaction, and amplification are the specific hazards associated with earthquakes. The severity of these hazards depends on several factors, including soil and slope conditions, proximity to the fault, earthquake magnitude, and the type of earthquake.

Ground Shaking

Ground shaking is the motion felt on the earth's surface caused by seismic waves generated by the earthquake. It is the primary cause of earthquake damage. The strength of ground shaking depends on the magnitude of the earthquake, the type of fault, and distance from the epicenter (where the earthquake originates). Buildings on poorly consolidated and thick soils will typically see more damage than buildings on consolidated soils and bedrock.

Seismic activity along nearby or more distant fault zones are likely to cause ground shaking within the City limits.

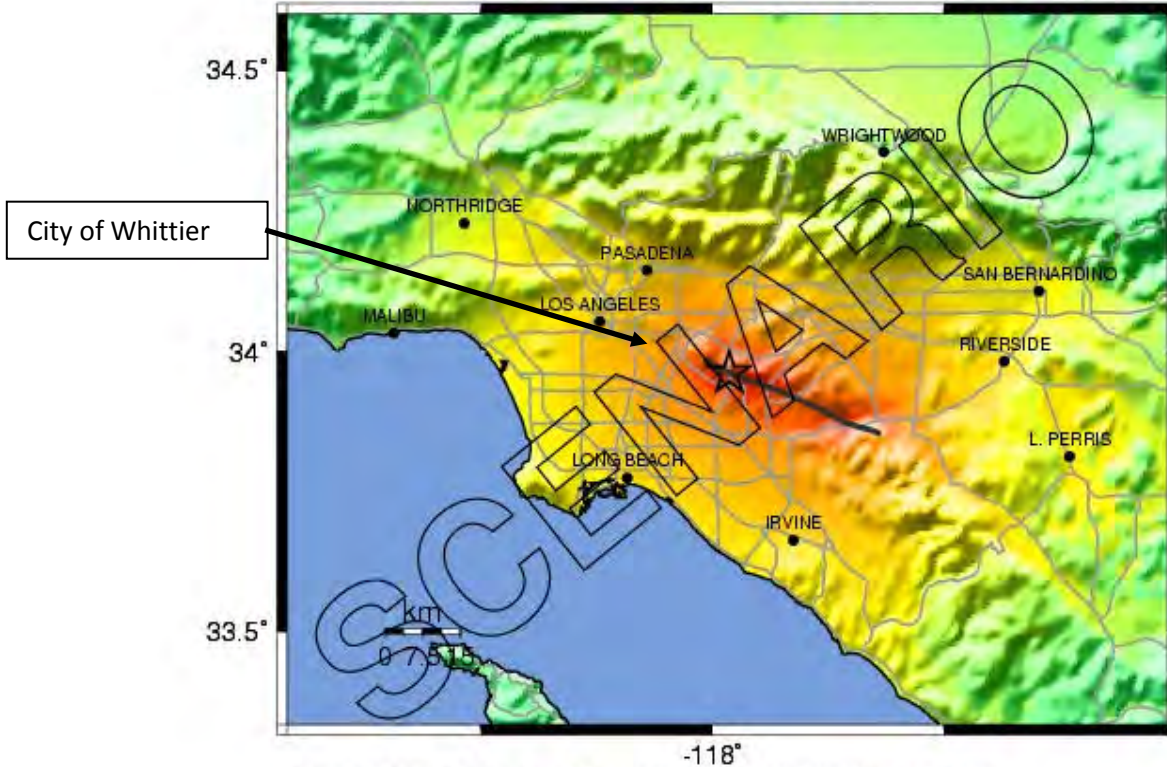


Map 7-5: Seismic Shaking Intensities for the Whittier Fault
(Source: <ftp://ftp.consrv.ca.gov/pub/dmg/rgmp/loss/s11.pdf>)

-- Earthquake Planning Scenario --

Rapid Instrumental Intensity Map for Whittier M6.8 Fault Scenario

Scenario Date: Mon Mar 11, 2002 04:00:00 AM PST M 6.8 N33.96 W117.96 Depth: 10.0km



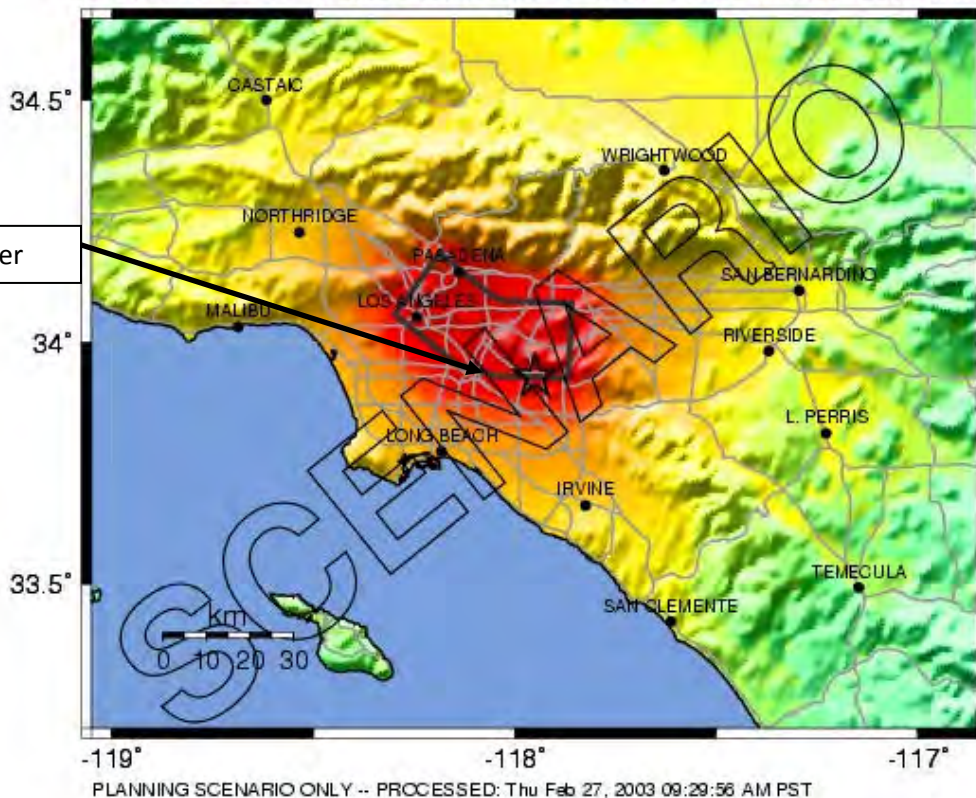
PLANNING SCENARIO ONLY -- PROCESSED: Tue Jul 30, 2002 02:45:43 PM PDT

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC (%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL (cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X



Map 7-6: Seismic Shaking Intensities for the Puente Hills Fault
(Source: <ftp://ftp.consrv.ca.gov/pub/dmg/rgmp/loss/s15.pdf>)

-- Earthquake Planning Scenario --
Rapid Instrumental Intensity Map for Puente Hills Scenario
Scenario Date: Sat Jan 11, 2003 04:00:00 AM PST M 7.1 N33.93 W117.95 Depth: 12.5km



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC (%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL (cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X

Fault Rupture

The potential for ground rupture due to fault movement is related to the seismic activity of known fault zones. Recognized active fault zones are located inside and outside the City of Whittier. It's important to note that even faults 20+ away could conceivably cause ground rupture within the City. *Note: Refer to the Whittier Background Report to the General Plan for additional information.*

Earthquake-Induced Landslide Potential

Generally, these types of failures consist of rock falls, disrupted soil slides, rock slides, soil lateral spreads, soil slumps, soil block slides, and soil avalanches. Areas having the potential for



earthquake-induced landslides generally occur in areas of previous landslide movement, or where local topographic, geological, geotechnical, and subsurface water conditions indicate a potential for permanent ground displacements. *Note: Refer to the Whittier Background Report to the General Plan for maps and additional information.*

Earthquake-Induced Landslides

Earthquake-induced landslides are secondary earthquake hazards that occur from ground shaking. They can destroy the roads, buildings, utilities, and other critical facilities necessary to respond and recover from an earthquake. Many communities in Southern California have a high likelihood of encountering such risks, especially in areas with steep slopes.

The Whittier Background Report to the General Plan indicates that seismic-induced slope failure can be expected within the hillsides north of the City of Whittier where slopes are 35 degrees or greater. The Report also states that slope failures are also highly probable where coarse rocks cover the bedrock hillsides.

Liquefaction

Soil liquefaction is a seismically induced form of ground failure, which has been a major cause of earthquake damage in southern California.

Liquefaction is a phenomenon in which the strength and stiffness of a soil is reduced by earthquake shaking or other events. Liquefaction occurs in saturated soils, which are soils in which the space between individual soil particles is completely filled with water. This water exerts a pressure on the soil particles that influences how tightly the particles themselves are pressed together. Prior to an earthquake, the water pressure is relatively low. However, earthquake shaking can cause the water pressure to increase to the point where the soil particles can readily move with respect to each other. Because liquefaction only occurs in saturated soil, its effects are most commonly observed in low lying areas. Typically liquefaction is associated with shallow

groundwater, which is less than 50 feet beneath the earth's surface.

According to the Whittier Background Report to the General Plan, the City is located in an area that ranges in liquefaction susceptibility from very low to moderate, depending on the location and depth to ground water. The majority of the City exhibits very low to low liquefaction susceptibility. Areas located in or at the mouths of canyons, and/or areas where there is shall ground water, are considered to have a moderate liquefaction susceptibility. Liquefaction within the City is generally not a hazard as the water table is deeper than 50 feet except for areas along drainage channels and shallow groundwater.

Liquefaction occurs when ground shaking causes wet granular soils to change from a solid state to a liquid state. This results in the loss of soil strength and the soil's ability to support weight. Buildings and their occupants are at risk when the ground can no longer support these structures. Liquefaction generally occurs during significant earthquake activity, and structures located on soils such as silt or sand may experience significant damage during an earthquake due to the instability of structural foundations and the moving earth. Many communities in southern California are built on ancient river bottoms and have sandy soil. In some cases this ground may be subject to liquefaction, depending on the depth of the water table.



Soil liquefaction is a seismically-induced form of ground failure, which has been a major cause of earthquake damage in southern California. During the 1971 San Fernando and 1994 Northridge earthquakes, significant damage to roads, utility pipelines, buildings, and other structures in the Los Angeles area were caused by liquefaction. Research and historical data indicate that loose, granular materials situated at depths of less than 50 feet with fines (silt and clay) contents of less than 30 percent, which are saturated by a relatively shallow groundwater table are most susceptible to liquefaction. These geological and groundwater conditions exist in parts of southern California and Whittier, typically in valley regions and alleviated floodplains.

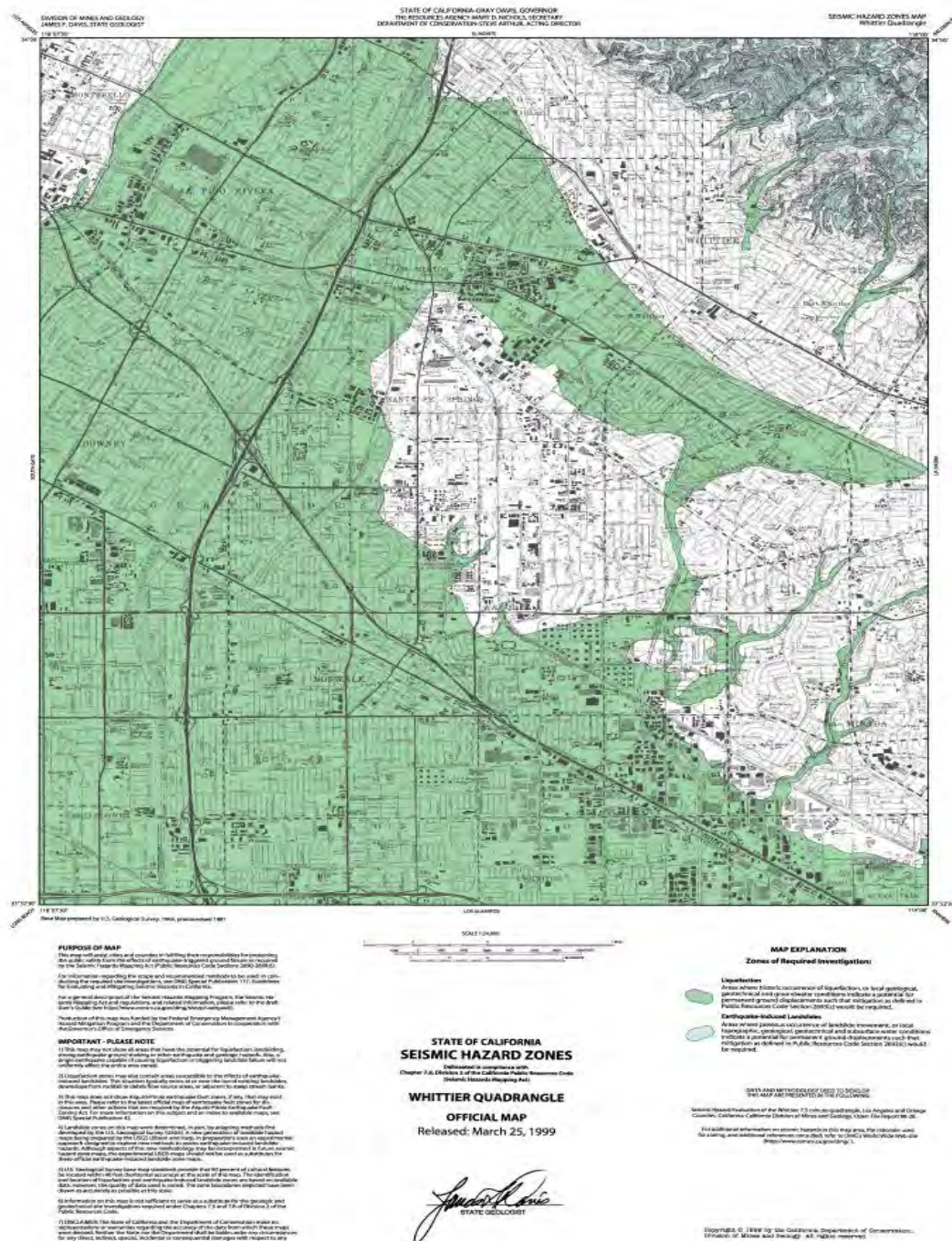
For liquefaction to occur, three general conditions must be met. The first condition – strong ground shaking of relatively long duration – can be expected to occur in the Whittier area as a result of an earthquake on any of the several active faults in the region. The second condition – loose, or unconsolidated, recently deposited sediments consisting primarily of silt and sand – occurs in a large portion of the valley floors, and in the larger canyon bottoms prevalent throughout Los Angeles County. The third condition is water saturated sediments within about 50 feet of the surface.

The California Geological Survey has identified areas most vulnerable to liquefaction. Liquefaction occurs when ground shaking causes wet granular soils to change from a solid state to a liquid state. This results in the loss of soil strength and the soil's ability to support weight. Buildings and their occupants are at risk when the ground can no longer support these buildings and structures. Map: Liquefaction and EQ-Induced Landslide Potential – Whittier Quadrangle identifies areas in the vicinity that are subject to liquefaction and landslides associated with earthquake activities.

The City of Whittier has facilities near liquefaction zones as shown on Map: Liquefaction and EQ-Induced Landslide Potential – Whittier Quadrangle.

Map: Liquefaction and EQ-Induced Landslide Potential – Whittier Quadrangle

(Source: http://gmw.consrv.ca.gov/shmp/download/pdf/ozn_whitt.pdf) (Note: a larger version of this map is available in City Hall)





Structure Failure

Whittier has a mix of older and newer structures. Since Whittier is still occupied with numerous structures constructed prior to modern building codes (beginning in 1973), many structures could be vulnerable to considerable damage following a significant seismic event.



“As the majority of homes in Whittier are over 50 years old, housing age and its condition will remain an ongoing priority in Whittier.”
General Plan Housing Element

As identified in the Whittier General Plan Housing Element (2014), Whittier has a predominantly older housing stock, with only 11% built since the 1970s. Most of the housing (63%) was built in the 1950s or earlier.

Table: Whittier Housing Age
(Source: Whittier General Plan – Housing Element 2014)

Decade Built	Housing Age	
	Number of Units	Percent of Units
Built 2000 or later	320	1%
1990s	664	2%
1980s	2,176	8%
1970s	3,268	11%
1960s	4,239	15%
1950s	10,914	38%
Before 1950	7,089	25%
Total	28,670	100%

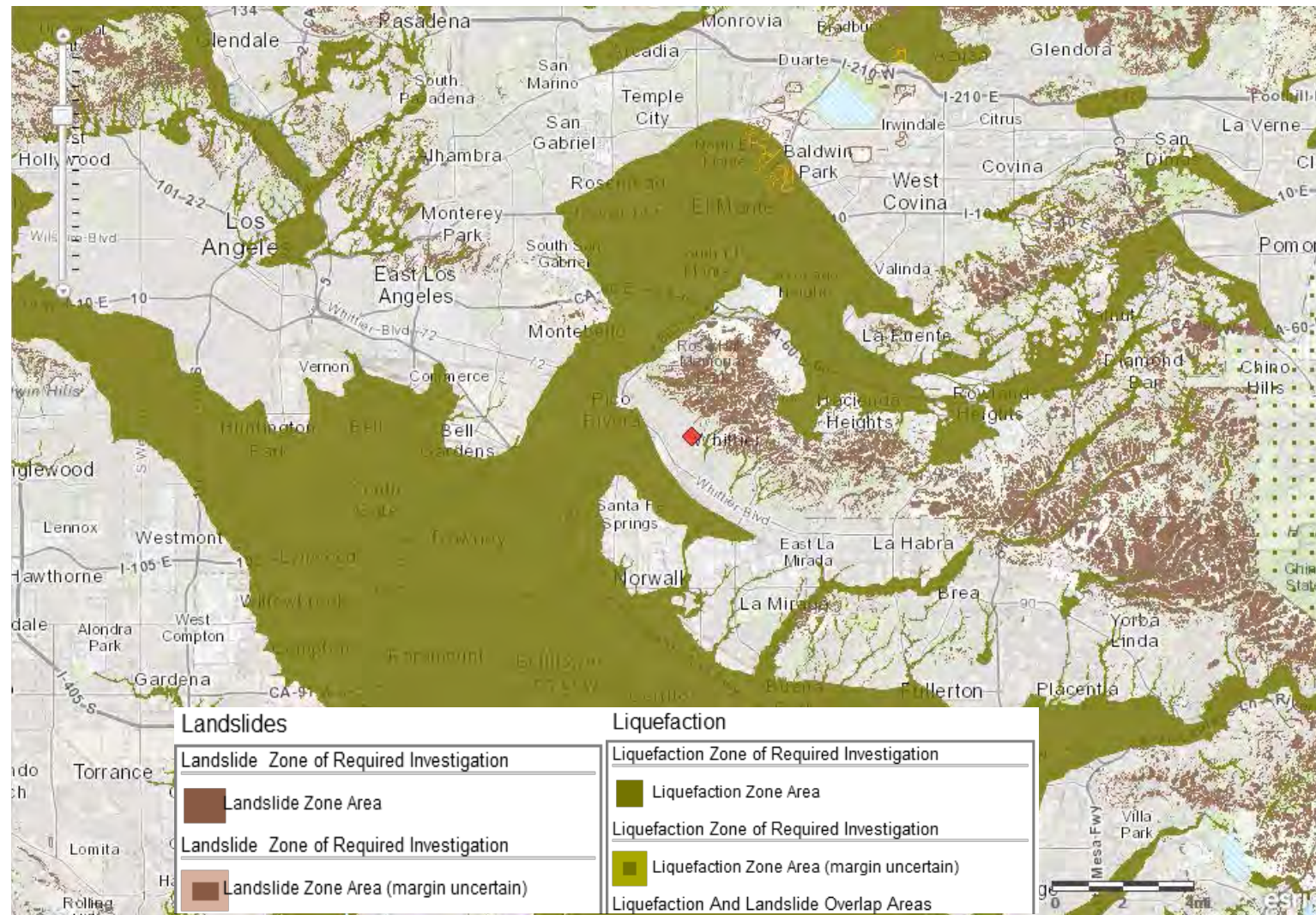
Source: American Community Survey, 2006–2010.

Note: Sample counts do not take into account vacant units or all units.

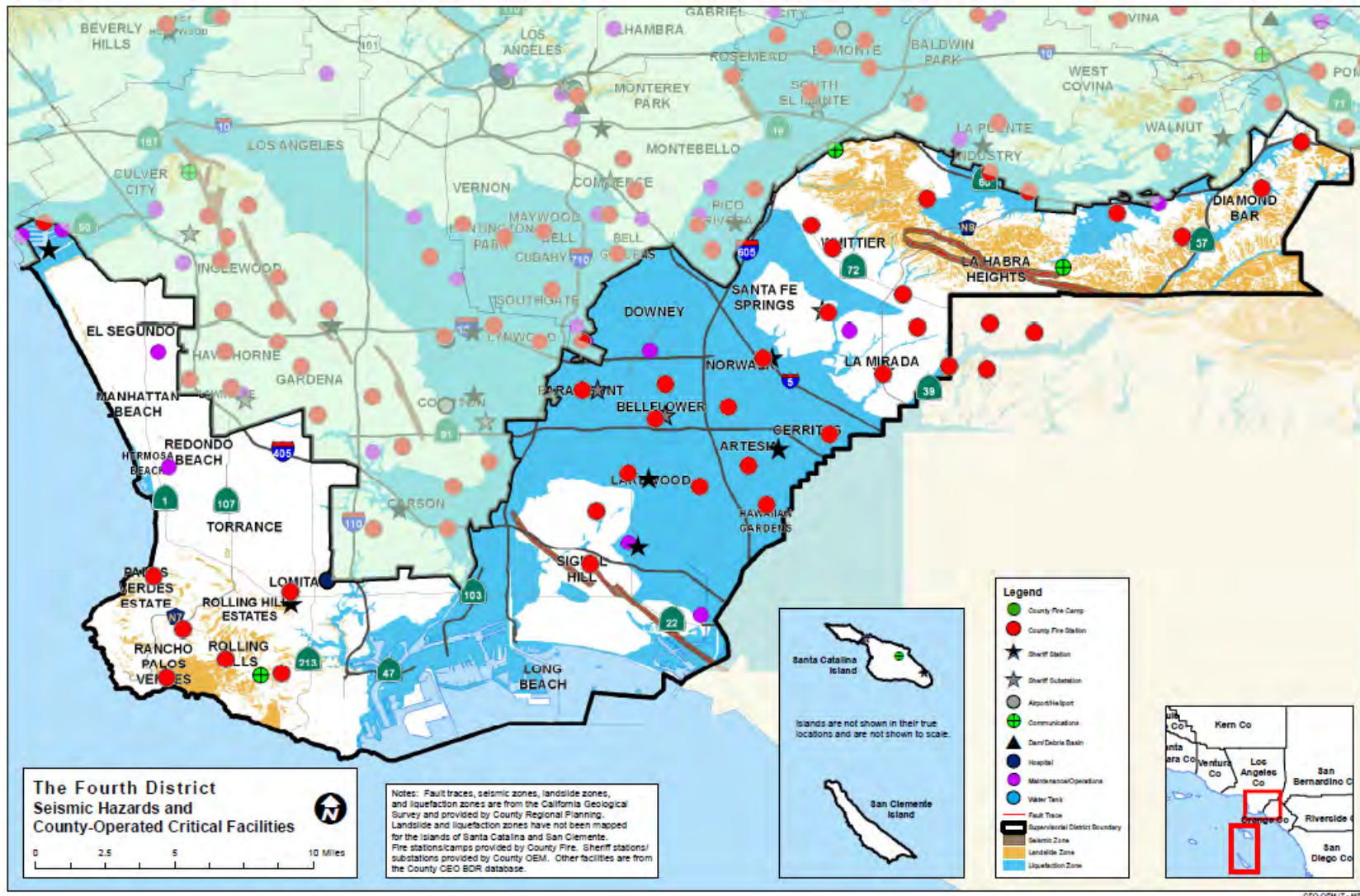
Amplification

Soils and soft sedimentary rocks near the earth's surface can modify ground shaking caused by earthquakes. One of these modifications is amplification. Amplification increases the magnitude of the seismic waves generated by the earthquake. The amount of amplification is influenced by the thickness of geologic materials and their physical properties. Buildings and structures built on soft and unconsolidated soils can face greater risk. Amplification can also occur in areas with deep sediment filled basins and on ridge top.

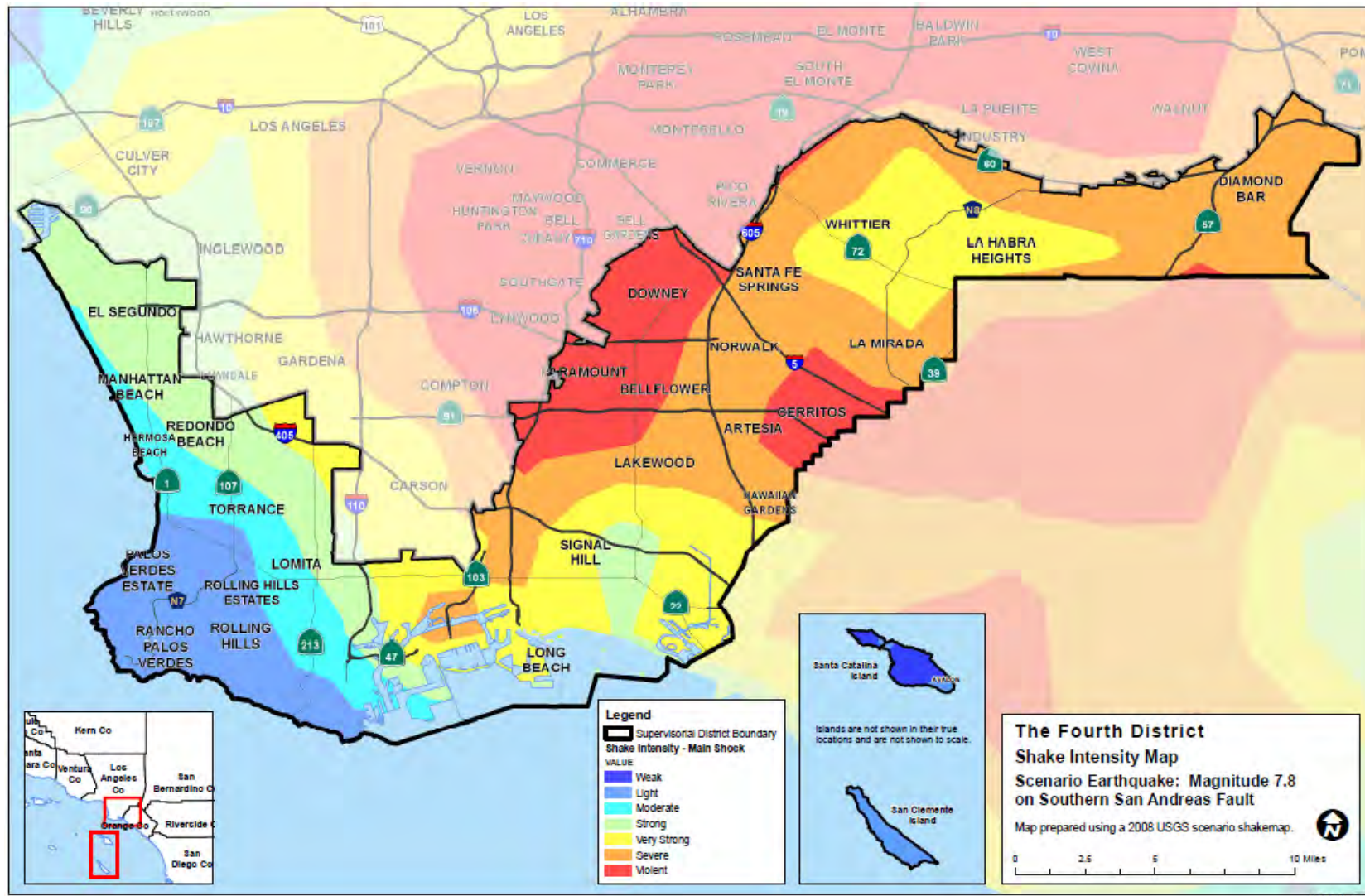
Map: Landslide and Liquefaction Zones in Whittier
(Source: California Office of Emergency Services)



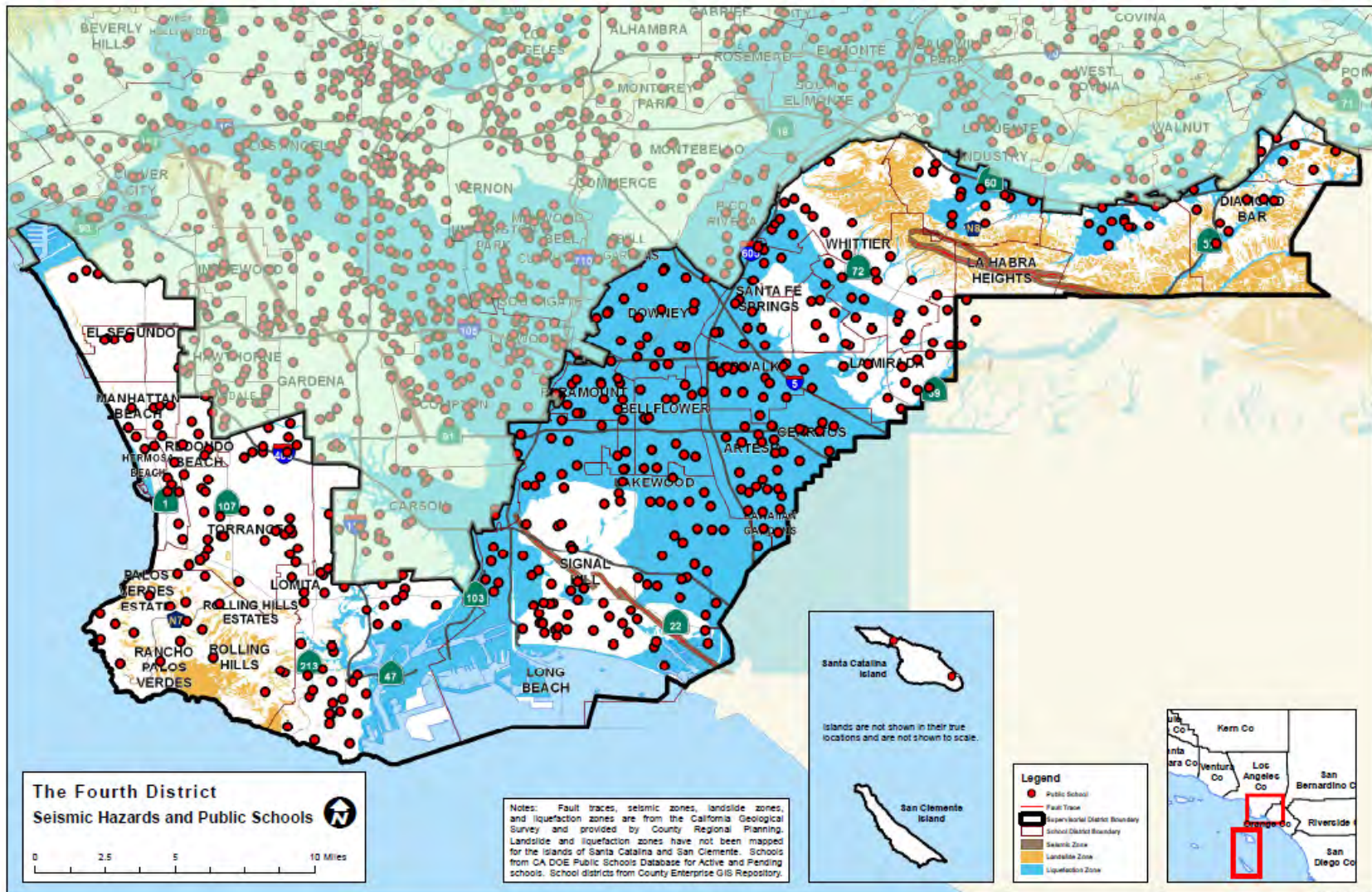
Map: Seismic Hazards and County-Operated Critical Facilities, District 4
(Source: County of Los Angeles Chief Executive Office - GIS)



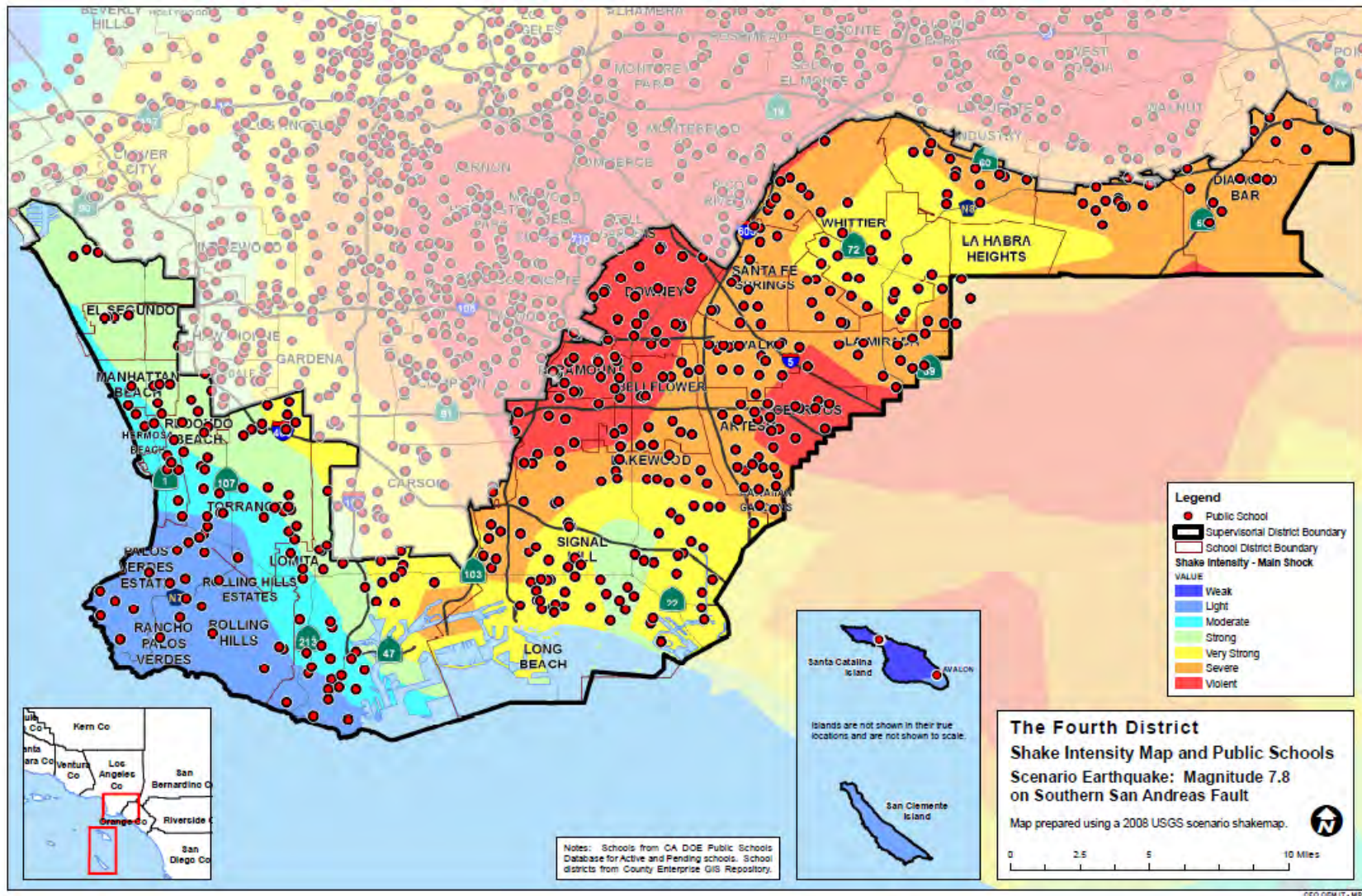
Map: Shake Intensity Map – San Andreas Fault M7.8, District 4
(Source: County of Los Angeles Chief Executive Office - GIS)



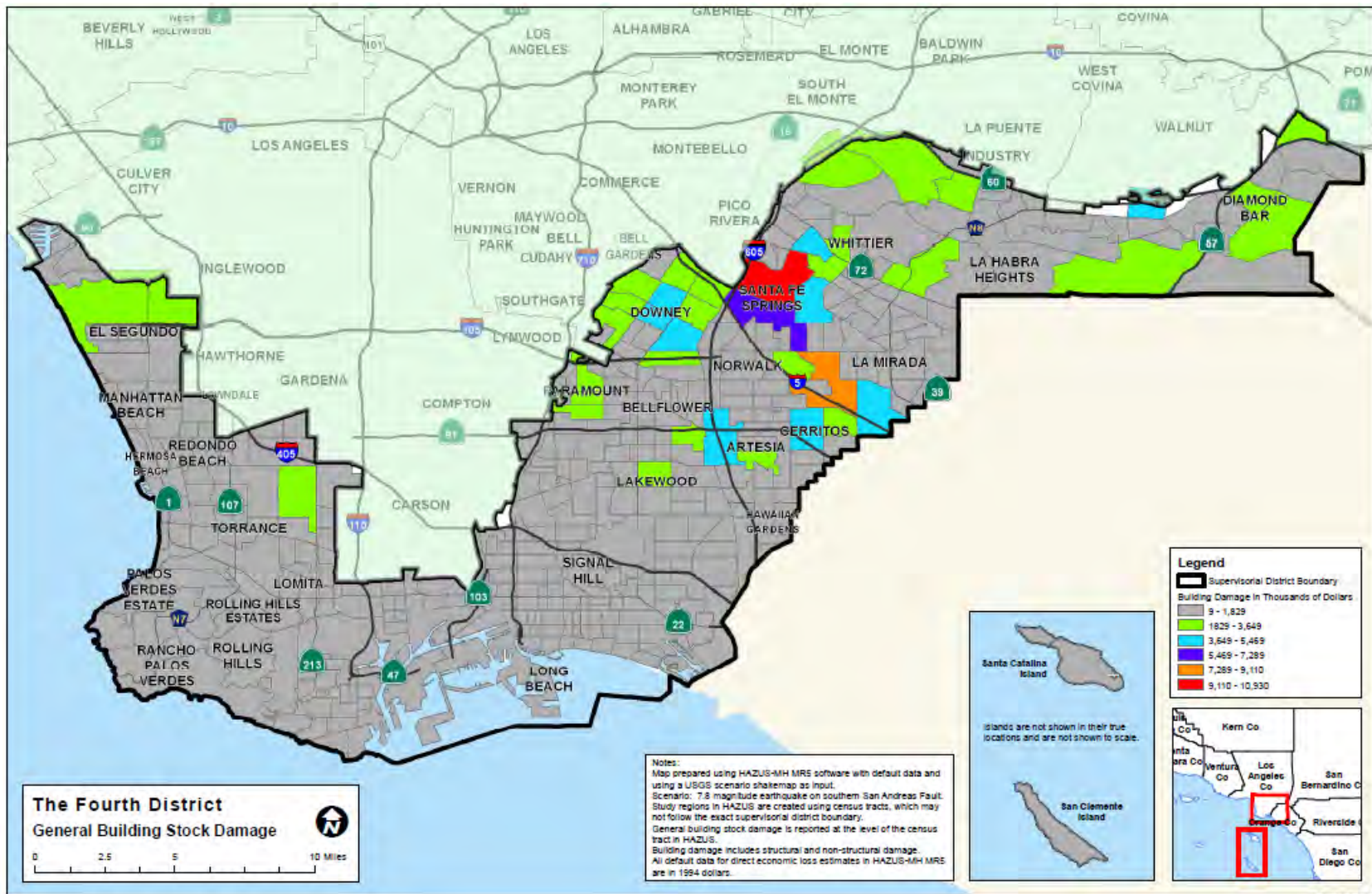
Map: Seismic Hazards and Public Schools, District 4
(Source: County of Los Angeles Chief Executive Office - GIS)



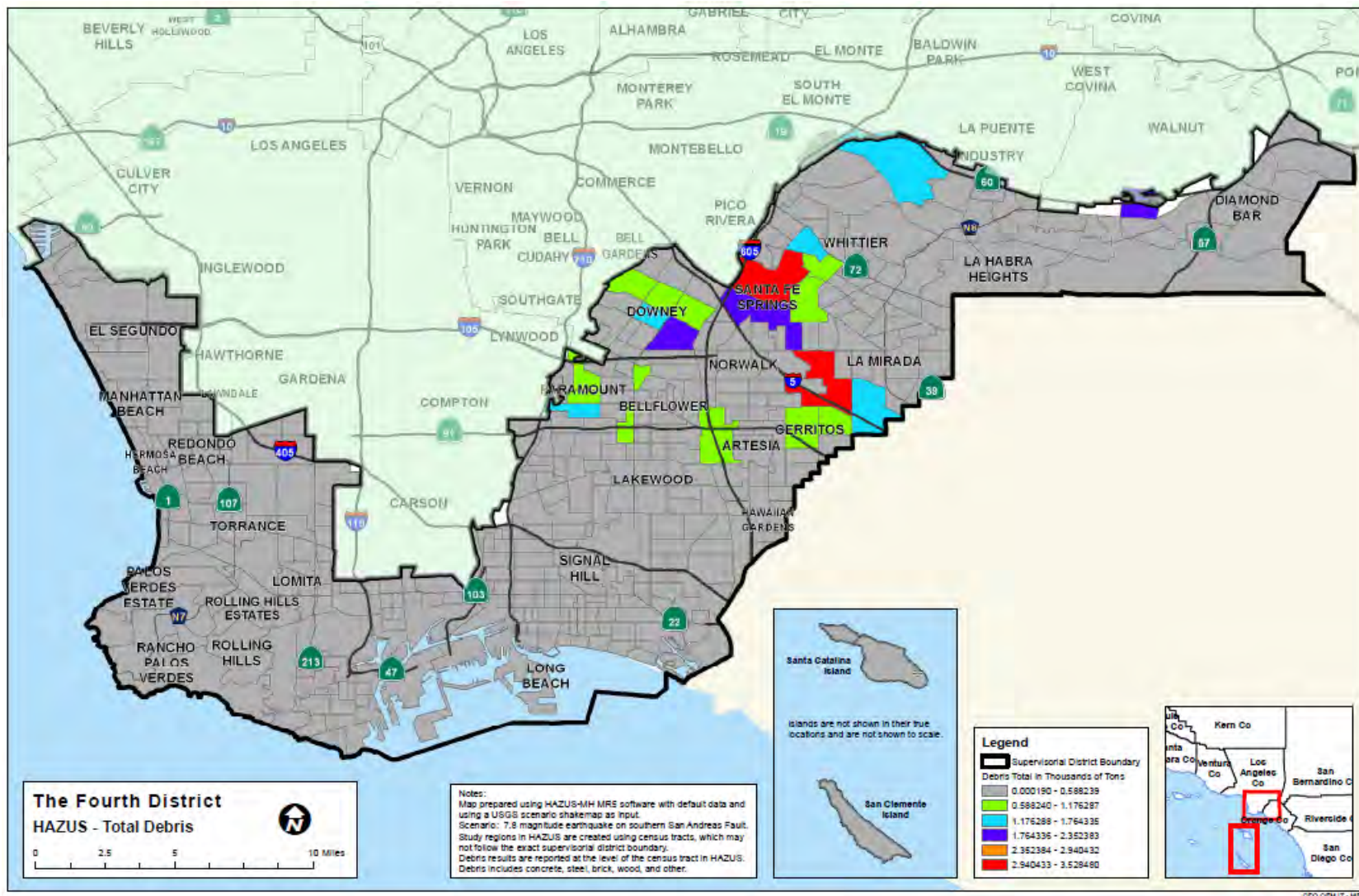
Map: Shake Intensity Map and Public Schools – San Andreas Fault M7.8, District 4
(Source: County of Los Angeles Chief Executive Office - GIS)



Map: General Building Stock Damage – San Andreas Fault M7.8, District 4
(Source: County of Los Angeles Chief Executive Office - GIS)



Map: Total Debris – San Andreas Fault M7.8, District 4
(Source: County of Los Angeles Chief Executive Office - GIS)





Attachment: HAZUS-MH Earthquake Event Report (All Districts) – San Andreas M7.8
(Source: County of Los Angeles Chief Executive Office - GIS)

HAZUS-MH: Earthquake Event Report

Region Name: LA County (All Districts)

Earthquake Scenario: ShakeMap_SAF_south78_se

Print Date: April 01, 2011

Totals only reflect data for those census tracts/blocks included in the user's study region.

Disclaimer:

The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.



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General Description of the Region

HAZUS is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of HAZUS is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

California

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 4,086.90 square miles and contains 2,054 census tracts. There are over 3,133 thousand households in the region with a total population of 9,519,338 people (2002 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 2,400 thousand buildings in the region with a total building replacement value (excluding contents) of 690,925 (millions of dollars). Approximately 91.00 % of the buildings (and 0.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 50,964 and 7,421 (millions of dollars) , respectively.



Building and Lifeline Inventory

Building Inventory

HAZUS estimates that there are 2,400 thousand buildings in the region which have an aggregate total replacement value of 690,925 (millions of dollars). Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 87% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

HAZUS breaks critical facilities into two (2) groups: essential facilities and high potential loss (HPL) facilities. Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 120 hospitals in the region with a total bed capacity of 28,258 beds. There are 3,230 schools, 50 fire stations, 166 police stations and 12 emergency operation facilities. With respect to HPL facilities, there are 103 dams identified within the region. Of these, 73 of the dams are classified as 'high hazard'. The inventory also includes 1,735 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within HAZUS, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 58,385.00 (millions of dollars). This inventory includes over 4,806 kilometers of highways, 3,128 bridges, 86,253 kilometers of pipes.



Table 1: Transportation System Lifeline Inventory

System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	3,128	10,915.00
	Segments	4,366	36,692.90
	Tunnels	17	34.30
	Subtotal		47,642.10
Railways	Bridges	144	28.40
	Facilities	47	125.20
	Segments	594	885.40
	Tunnels	0	0.00
	Subtotal		1,038.90
Light Rail	Bridges	28	6.20
	Facilities	92	245.00
	Segments	99	376.50
	Tunnels	0	0.00
	Subtotal		627.70
Bus	Facilities	42	54.00
	Subtotal		54.00
Ferry	Facilities	10	13.30
	Subtotal		13.30
Port	Facilities	159	317.50
	Subtotal		317.50
Airport	Facilities	16	170.40
	Runways	29	1,101.00
	Subtotal		1,271.40
		Total	50,965.00



Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	862.50
	Facilities	15	589.40
	Pipelines	0	0.00
	Subtotal		1,451.90
Waste Water	Distribution Lines	NA	517.50
	Facilities	19	1,493.20
	Pipelines	0	0.00
	Subtotal		2,010.70
Natural Gas	Distribution Lines	NA	345.00
	Facilities	1	1.30
	Pipelines	0	0.00
	Subtotal		346.30
Oil Systems	Facilities	44	5.20
	Pipelines	0	0.00
	Subtotal		5.20
Electrical Power	Facilities	41	5,321.80
	Subtotal		5,321.80
Communication	Facilities	94	11.10
	Subtotal		11.10
		Total	9,147.00



Earthquake Scenario

HAZUS uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	ShakeMap_SAF_south78_se
Type of Earthquake	User-defined
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	7.80
Depth (Km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA



Building Damage

Building Damage

HAZUS estimates that about 38,880 buildings will be at least moderately damaged. This is over 2.00 % of the total number of buildings in the region. There are an estimated 4,418 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the HAZUS technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	3,546	0.16	361	0.24	167	0.61	75	1.04	40	0.91
Commercial	135,569	6.13	11,912	7.92	4,449	16.34	1,384	19.15	818	18.51
Education	4,932	0.22	313	0.21	94	0.34	23	0.32	16	0.35
Government	2,159	0.10	194	0.13	98	0.36	32	0.44	12	0.27
Industrial	32,428	1.47	3,770	2.51	1,864	6.84	652	9.02	286	6.48
Other Residential	304,224	13.76	25,573	17.00	9,880	36.28	4,645	64.25	3,144	71.14
Religion	9,734	0.44	761	0.51	316	1.16	110	1.53	58	1.30
Single Family	1,718,758	77.72	107,545	71.49	10,364	38.06	308	4.26	46	1.03
Total	2,211,351		150,428		27,232		7,229		4,419	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	1,959,076	88.59	120,896	80.37	11,572	42.49	372	5.14	149	3.36
Steel	45,376	2.05	5,463	3.63	3,296	12.10	1,259	17.42	516	11.68
Concrete	49,136	2.22	4,392	2.92	1,612	5.92	492	6.80	341	7.72
Precast	37,603	1.70	3,603	2.39	1,216	4.47	296	4.09	184	4.17
RM	77,355	3.50	2,877	1.91	1,107	4.07	444	6.15	261	5.90
URM	15,516	0.70	1,861	1.24	394	1.45	91	1.26	130	2.94
MH	27,288	1.23	11,335	7.54	8,034	29.50	4,275	59.14	2,838	64.23
Total	2,211,351		150,428		27,232		7,229		4,419	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing



Essential Facility Damage

Before the earthquake, the region had 28,258 hospital beds available for use. On the day of the earthquake, the model estimates that only 27,911 hospital beds (99.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 100.00% of the beds will be back in service. By 30 days, 100.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	120	0	0	120
Schools	3,230	0	0	3,163
EOCs	12	0	0	11
PoliceStations	166	0	0	164
FireStations	50	0	0	48



Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	4,366	0	0	4,366	4,366
	Bridges	3,128	48	3	3,078	3,100
	Tunnels	17	0	0	17	17
Railways	Segments	594	0	0	594	594
	Bridges	144	3	0	141	143
	Tunnels	0	0	0	0	0
	Facilities	47	0	0	47	47
Light Rail	Segments	99	0	0	99	99
	Bridges	28	0	0	28	28
	Tunnels	0	0	0	0	0
	Facilities	92	0	0	92	92
Bus	Facilities	42	1	0	42	42
Ferry	Facilities	10	0	0	10	10
Port	Facilities	159	0	0	159	159
Airport	Facilities	16	0	0	16	16
	Runways	29	0	0	29	29

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, HAZUS performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.



Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	15	0	0	15	15
Waste Water	19	0	0	17	19
Natural Gas	1	0	0	1	1
Oil Systems	44	0	0	44	44
Electrical Power	41	0	0	41	41
Communication	94	1	0	94	94

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	43,127	8647	2162
Waste Water	25,876	4344	1086
Natural Gas	17,251	1488	372
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	3,133,774	640,614	616,149	567,247	296,313	0
Electric Power		28,768	16,895	6,399	1,131	42



Induced Earthquake Damage

Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. HAZUS uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 132 ignitions that will burn about 0.95 sq. mi 0.02 % of the region's total area.) The model also estimates that the fires will displace about 13,672 people and burn about 809 (millions of dollars) of building value.

Debris Generation

HAZUS estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1.550 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 32.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 62,160 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.



Social Impact

Shelter Requirement

HAZUS estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1,504 households to be displaced due to the earthquake. Of these, 1,387 people (out of a total population of 9,519,338) will seek temporary shelter in public shelters.

Casualties

HAZUS estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake



Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	19	5	1	1
	Commuting	0	0	1	0
	Educational	0	0	0	0
	Hotels	9	2	0	1
	Industrial	37	9	1	2
	Other-Residential	831	181	18	33
	Single Family	291	20	2	4
	Total	1,188	217	23	42
2 PM	Commercial	1,399	350	54	105
	Commuting	2	3	5	1
	Educational	724	202	33	65
	Hotels	2	0	0	0
	Industrial	270	62	9	17
	Other-Residential	183	41	4	8
	Single Family	57	4	0	1
	Total	2,637	663	106	197
5 PM	Commercial	1,313	339	54	100
	Commuting	67	91	152	30
	Educational	70	18	3	6
	Hotels	3	1	0	0
	Industrial	169	39	5	10
	Other-Residential	303	66	7	12
	Single Family	107	8	1	1
	Total	2,032	562	222	160



Economic Loss

The total economic loss estimated for the earthquake is 7,732.12 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 7,183.68 (millions of dollars); 15 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 46 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	7.76	257.23	18.80	12.01	295.80
	Capital-Related	0.00	3.32	224.01	11.72	2.81	241.86
	Rental	16.21	39.21	117.18	7.95	5.82	186.37
	Relocation	49.94	53.60	161.02	34.04	39.77	338.37
	Subtotal	66.15	103.90	759.44	72.51	60.41	1,062.39
Capital Stock Losses							
	Structural	159.79	110.19	243.45	99.12	46.70	659.25
	Non_Structural	1,263.96	785.92	1,066.05	375.43	181.99	3,673.35
	Content	559.97	232.88	584.37	245.32	99.82	1,722.36
	Inventory	0.00	0.00	17.47	47.79	1.06	66.32
	Subtotal	1,983.72	1,129.00	1,911.34	767.66	329.56	6,121.28
	Total	2,049.86	1,232.89	2,670.78	840.17	389.97	7,183.68



Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, HAZUS computes the direct repair cost for each component only. There are no losses computed by HAZUS for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

HAZUS estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	36,692.89	\$0.00	0.00
	Bridges	10,914.99	\$108.43	0.99
	Tunnels	34.27	\$0.25	0.72
	Subtotal	47642.10	108.70	
Railways	Segments	885.42	\$0.00	0.00
	Bridges	28.36	\$0.31	1.09
	Tunnels	0.00	\$0.00	0.00
	Facilities	125.16	\$12.09	9.66
	Subtotal	1038.90	12.40	
Light Rail	Segments	376.51	\$0.00	0.00
	Bridges	6.17	\$0.01	0.19
	Tunnels	0.00	\$0.00	0.00
	Facilities	245.00	\$25.85	10.55
	Subtotal	627.70	25.90	
Bus	Facilities	54.02	\$6.03	11.17
	Subtotal	54.00	6.00	
Ferry	Facilities	13.31	\$0.57	4.30
	Subtotal	13.30	0.60	
Port	Facilities	317.52	\$15.12	4.76
	Subtotal	317.50	15.10	
Airport	Facilities	170.42	\$19.35	11.36
	Runways	1,100.96	\$0.00	0.00
	Subtotal	1271.40	19.40	
	Total	50965.00	188.00	



Table 13: Utility System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.00	\$0.00	0.00
	Facilities	589.40	\$33.67	5.71
	Distribution Lines	862.50	\$38.91	4.51
	Subtotal	1,451.94	\$72.58	
Waste Water	Pipelines	0.00	\$0.00	0.00
	Facilities	1,493.20	\$52.70	3.53
	Distribution Lines	517.50	\$19.55	3.78
	Subtotal	2,010.69	\$72.25	
Natural Gas	Pipelines	0.00	\$0.00	0.00
	Facilities	1.30	\$0.03	2.57
	Distribution Lines	345.00	\$6.70	1.94
	Subtotal	346.30	\$6.73	
Oil Systems	Pipelines	0.00	\$0.00	0.00
	Facilities	5.20	\$0.18	3.43
	Subtotal	5.19	\$0.18	
Electrical Power	Facilities	5,321.80	\$208.13	3.91
	Subtotal	5,321.80	\$208.13	
Communication	Facilities	11.10	\$0.55	5.00
	Subtotal	11.09	\$0.55	
	Total	9,147.01	\$360.42	



Table 14. Indirect Economic Impact with outside aid
(Employment as # of people and Income in millions of \$)

LOSS		Total	%
First Year			
	Employment Impact	2,053,169	64.19
	Income Impact	5,443	3.61
Second Year			
	Employment Impact	886,723	27.72
	Income Impact	3,263	2.17
Third Year			
	Employment Impact	21,528	0.67
	Income Impact	793	0.53
Fourth Year			
	Employment Impact	1,214	0.04
	Income Impact	(148)	-0.10
Fifth Year			
	Employment Impact	70	0.00
	Income Impact	(201)	-0.13
Years 6 to 15			
	Employment Impact	0	0.00
	Income Impact	(204)	-0.14



Appendix A: County Listing for the Region

Los Angeles, CA



Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
California	Los Angeles	9,519,338	522,619	168,306	690,925
Total State		9,519,338	522,619	168,306	690,925
Total Region		9,519,338	522,619	168,306	690,925



Risk Analysis

Risk analysis is the third phase of a hazard assessment. Risk analysis involves estimating the damage and costs likely to be experienced in a geographic area over a period of time. Factors included in assessing earthquake risk, include population and property distribution in the hazard area, the frequency of earthquake events, landslide susceptibility, buildings, infrastructure, and disaster preparedness of the region. This type of analysis can generate estimates of the damages to the region due to an earthquake event in a specific location. FEMA's software program, HAZUS, uses mathematical formulas and information about building stock, local geology and the location and size of potential earthquakes, economic data, and other information, to estimate losses from a potential earthquake.

The HAZUS reports and maps above were extracted from the County of Los Angeles All-Hazards Mitigation Plan (2014).

For greater Southern California there are multiple worst case scenarios, depending on which fault might rupture, and which communities are in proximity to the fault. But damage will not necessarily be limited to immediately adjoining communities. Depending on the hypocenter of the earthquake, seismic waves may be transmitted through the ground to unsuspecting communities. In the 1994 Northridge Earthquake, Santa Monica suffered extensive damage, even though there was a range of mountains between it and the origin of the earthquake.

Damages for a large earthquake almost anywhere in Southern California are likely to run into the billions of dollars. Although building codes are some of the most stringent in the world, tens of thousands of older existing buildings were built under much less rigid codes. California has laws affecting un-reinforced masonry buildings (URM's) and although many building owners have retrofitted their buildings, hundreds of pre-1933 buildings still have not been brought up to current standards.

Non-structural bracing of equipment and contents is often the most cost-effective type of seismic mitigation. Inexpensive bracing and anchoring may be the most cost effective way to protect expensive equipment. Non-structural bracing of equipment and furnishings will also reduce the chance of injury for the occupants of a building.

Community Earthquake Issues

What is Susceptible to Earthquakes?

Earthquake damage occurs because humans have built structures that cannot withstand severe shaking. Buildings, airports, schools, and lifelines (highways and utility lines) suffer damage in earthquakes and can cause death or injury to humans. The welfare of homes, major businesses, and public infrastructure is very important. Addressing the reliability of buildings, critical facilities, and infrastructure, and understanding the potential costs to government, businesses, and individuals as a result of an earthquake, are challenges faced by the City.

Dams

The Whittier Narrows Dam is located approximately 4 miles northwest of the City center. It is west of the San Gabriel River flood control channel and the Freeway (SR-605). The dam holds



9.75 million gallons of water. According to the City's General Plan, inundation from flood waters released from the Whittier Narrows Dam includes a limited area of low populated areas in the northwest corner of the city (essentially the City's Wellfield and water pumping plant). Flooding from city reservoirs can be prevented by the construction of earthquake resistant dams and reservoirs.

There are a total of 103 dams in Los Angeles County, owned by 23 agencies or organizations, ranging from the Federal government to homeowner associations. These dams hold billions of gallons of water in reservoirs. Releases of water from the major reservoirs are designed to protect Southern California from flood waters and to store domestic water. Seismic activity can compromise the dam structures, and the resultant flooding could cause catastrophic flooding. Following the 1971 Sylmar Earthquake the Lower Van Norman Dam showed signs of structural compromise, and tens of thousands of persons had to be evacuated until the dam could be drained. The dam has never been refilled.

Because of the current design and construction practices, as well as ongoing programs of review and modification, catastrophic dam failure is considered unlikely to impact Whittier. Many flood control channels are expected to suffer damage.

Buildings

The built environment is susceptible to damage from earthquakes. Buildings that collapse can trap and bury people. Lives are at risk, and the cost to clean up the damages is great. In the City of Whittier many buildings were built before 1993 when building codes were not as strict. In addition, retrofitting is not required except under certain conditions and can be expensive. Therefore, the number of buildings at risk remains high. The California Seismic Safety Commission makes annual reports on the progress of the retrofitting of unreinforced masonry buildings. Unreinforced masonry (URM) buildings are examined on an "as known" basis during the permitting process. No City-wide inventories of unreinforced masonry buildings have been conducted in the past.

Infrastructure and Communication

Residents in the City of Whittier commute frequently by automobiles and public transportation such as buses and light rail. An earthquake can greatly damage bridges and roads, hampering emergency response efforts and the normal movement of people and goods. Damaged infrastructure strongly affects the economy of the community because it disconnects people from work, school, food, and leisure, and separates businesses from their customers and suppliers.

System failure, overloads, loss of electrical power, and possible failure of some alternate power systems will likely affect telephone systems. Immediately after the event, numerous failures will occur as well as system overloads. This will disable an estimated 80% of the telephone system for one day.

Radio systems are expected to be 40-75% effective, and microwave systems may be effective as little as 30% or less.

It is expected that 21 of the 59 railroad route segments serving the Southern California region could be unavailable for post-earthquake service. These 21 segments all include major



connections with the north. This includes Metrolink and Union Pacific lines that pass through Whittier. The post-earthquake capacity to serve both Los Angeles and Orange County areas would be very small – probably no more than five trains per day. This is a dramatic decrease from the normal 120-140 trains that currently run through the same area. Additionally, many railroad bridges are highly susceptible to damage because of age, design, and construction. The likelihood of highway bridge collapse could also affect the ability of trains to service nearby areas.

Bridge Damage

Even modern bridges can sustain damage during earthquakes, leaving them unsafe for use. Some bridges have failed completely due to strong ground motion. Bridges are a vital transportation link - with even minor damages, making some areas inaccessible. Because bridges vary in size, materials, location and design, any given earthquake will affect them differently. Bridges built before the mid-1970's have a significantly higher risk of suffering structural damage during a moderate to large earthquake compared with those built after 1980 when design improvements were made.

Much of the interstate highway system was built in the mid to late 1960's. The bridges in the City of Whittier are state, county or privately owned (including railroad bridges). Caltrans has retrofitted most bridges on the freeway systems; however there are still some county maintained bridges that are not retrofitted. The FHWA requires that bridges on the National Bridge Inventory be inspected every 2 years. Caltrans checks when the bridges are inspected because they administer the Federal funds for bridge projects.

Damage to the San Bernardino Freeway - Interstate 10, and the Foothill Freeway - Interstate 210, is expected to be major. Any inner surface transportation routes could be subject to delays and detours. A major portion of surface streets in the vicinity of freeways will be blocked due to collapsed overpasses. Many surface streets in the older central business districts will be blocked by debris from buildings, falling electrical wires, and pavement damage.

Damage to Lifelines

Lifelines are the connections between communities and outside services. They include water and gas lines, transportation systems, and electricity and communication networks. Ground shaking and amplification can cause pipes to break open, power lines to fall, roads and railways to crack or move, and radio and telephone communication to cease. Disruption to transportation makes it especially difficult to bring in supplies or services.

Lifelines need to be usable after earthquake to allow for rescue, recovery, and rebuilding efforts and to relay important information to the public.

Disruption of Critical Services

Critical facilities include police stations, fire stations, hospitals, shelters, and other facilities that provide important services to the community. These facilities and their services need to be functional after an earthquake event. Some of Whittier's critical facilities are housed in older buildings, though they are up to current seismic codes. See below for additional information pertaining to hospitals.



Individual Preparedness

Because the potential for earthquake occurrences, and earthquake related property damage, is relatively high in Los Angeles County, increasing individual preparedness is a significant need. Strapping down heavy furniture, water heaters, and expensive personal property, as well as being earthquake- insured, and anchoring buildings to foundations, are just a few steps individuals can take to prepare for an earthquake.

Death and Injury

Death and injury can occur both inside and outside of buildings due to collapsed buildings, falling equipment, furniture, debris, and structural materials. Downed power lines and broken water and gas lines can also endanger human life.

Fire

Downed power lines or broken gas mains can trigger fires. When fire stations suffer building or lifeline damage, quick response to extinguish fires is less likely. Furthermore, major incidents demand a larger share of resources, and initially smaller fires and problems receive little or insufficient resources in the initial hours after a major earthquake event.

Loss of electricity may cause a loss of water pressure in some communities, further hampering firefighting ability.

Debris

After damage to a variety of structures, much time is spent cleaning up brick, glass, wood, steel or concrete building elements, office and home contents, and other materials. Developing a strong debris management strategy is essential in post-disaster recovery, especially because the City owns and operates its own solid waste landfill. Disasters do not exempt the City of Whittier from compliance with AB 939: Integrated Waste Management Act, which mandates reduction of waste being disposed.

Existing Mitigation Activities

Existing mitigation activities include current mitigation programs and activities that are implemented by county, regional, state, or federal agencies or organizations.

City of Whittier Codes

Implementation of earthquake mitigation policy most often takes place at the local government level. The City of Whittier Community Development Department- Building Division enforces building codes pertaining to earthquake hazards.

The following sections of the UBC address the earthquake hazard:

- 1605.2.1 (Distribution of Horizontal Shear);
- 1605. 2 (Stability against Overturning);
- 1605.2.3 (Anchorage);
- 1626 (Seismic);



1632, 1633, 1633.9 deal with specific earthquake hazards;
1809 (Liquefaction, Anchorage); and
2320 (Distribution of Horizontal Shear)

Additionally, the City has implemented basic building requirements that are above and beyond what the State demands for hazard mitigation. Newly constructed buildings in Whittier that are built in an area subject to earthquake-induced landslide or liquefaction are typically built with extra foundation support. Such support is found in the post-tension reinforced concrete foundation; this same technique is used by coastal cities to prevent home destruction during cases of liquefaction. The City of Whittier goes above and beyond normal building requirements to better protect at-risk areas.

Generally, these codes seek to discourage development in areas that could be prone to flooding, landslide, wildfire and / or seismic hazards; and where development is permitted, that the applicable construction standards are met. Developers in hazard-prone areas may be required to retain a qualified professional engineer to evaluate level of risk on the site and recommend appropriate mitigation measures.

Coordination among Building Officials

The City of Whittier Building Code sets the minimum design and construction standards for new buildings. In 2003, the City adopted the most recent seismic standards in its building code, which requires that new buildings be built at a higher seismic standard.

Since 2003 the City also requires that site-specific seismic hazard investigations be performed for new essential facilities, major structures, hazardous facilities, and special occupancy structures such as schools, hospitals, and emergency response facilities.

Businesses/Private Sector

Seismic activity can cause great loss to businesses, both large-scale corporations and small retail shops. When a company is forced to stop production for just a day, the economic loss can be tremendous, especially when its market is at a national or global level. Seismic activity can create economic loss that presents a burden to large and small shop owners who may have difficulty recovering from their losses.

Forty percent of businesses do not reopen after a disaster, and another twenty-five percent fail within one year, according to FEMA. Similar statistics from the U.S. Small Business Administration indicate that over ninety percent of businesses fail within two years after being struck by a disaster.

Hospitals

There are two hospitals in Whittier. The Whittier Medical Center is located near Colima Road and Whittier Boulevard. The Presbyterian Intercommunity Hospital is located on Washington Boulevard near Whittier Boulevard.

The “Alfred E. Alquist Hospital Seismic Safety Act” (“Hospital Act”) was enacted in 1973 in response to the moderate Magnitude 6.6 Sylmar Earthquake in 1971 when four major hospital



campuses were severely damaged and evacuated. Two hospital buildings collapsed killing forty-seven people. Three others were killed in another hospital that nearly collapsed.

In approving the Act, the Legislature noted that: “Hospitals, that house patients who have less than the capacity of normally healthy persons to protect themselves, and that must be reasonably capable of providing services to the public after a disaster, shall be designed and constructed to resist, insofar as practical, the forces generated by earthquakes, gravity and winds.” (Health and Safety Code Section 129680)

When the Hospital Act was passed in 1973, the State anticipated that, based on the regular and timely replacement of aging hospital facilities, the majority of hospital buildings would be in compliance with the Act’s standards within 25 years. However, hospital buildings were not, and are not, being replaced at that anticipated rate. In fact, the great majority of the State’s urgent care facilities are now more than 40 years old.

The moderate Magnitude 6.7 Northridge Earthquake in 1994, caused \$3 billion in hospital-related damage and evacuations. Twelve hospital buildings constructed before the Act were cited (red tagged) as unsafe for occupancy after the earthquake. Those hospitals that were built in accordance with the 1973 Hospital Act were very successful in resisting structural damage. However, nonstructural damage (for example, plumbing and ceiling systems) was extensive in those post-1973 buildings. Senate Bill 1953 (SB 1953), enacted in 1994 after the Northridge Earthquake, expanded the scope of the 1973 Hospital Act. Under SB 1953, all hospitals are required, as of January 1, 2008, to survive earthquakes without collapsing or posing the threat of significant loss of life. The 1994 Act further mandates that all existing hospitals be seismically evaluated, and retrofitted, if needed, by 2030, so that they are in substantial compliance with the Act (which requires that the hospital buildings be reasonably capable of providing services to the public after disasters). SB 1953 applies to all urgent care facilities (including those built prior to the 1973 Hospital Act) and affects approximately 2,500 buildings on 475 campuses.

SB 1953 directed the Office of Statewide Health Planning and Development (“OSHDP”), in consultation with the Hospital Building Safety Board, to develop emergency regulations including “...earthquake performance categories with sub gradations for risk to life, structural soundness, building contents, and nonstructural systems that are critical to providing basic services to hospital inpatients and the public after a disaster.” (Health and Safety Code Section 130005)

The Seismic Safety Commission Evaluation of the State’s Hospital Seismic Safety Policies

In 2001, recognizing the continuing need to assess the adequacy of policies, and the application of advances in technical knowledge and understanding, the California Seismic Safety Commission created an Ad Hoc Committee to re-examine the compliance with the Alquist Hospital Seismic Safety Act. The formation of the Committee was also prompted by the recent evaluations of hospital buildings reported to OSHDP that revealed that a large percentage (40%) of California’s operating hospitals are in the highest category of collapse risk.

California Earthquake Mitigation Legislation

California is painfully aware of the threats it faces from earthquakes. Dating back to the 19th century, Californians have been killed, injured, and lost property as a result of earthquakes. As



the State's population continues to grow, and urban areas become even denser, the risk will continue to increase. For decades the Legislature has passed laws to strengthen the built environment and protect the residents.

Table: Sampling of Earthquake Laws in California provides a sampling of some of Earthquake laws in California.

Table: Sampling of Earthquake Laws in California
(Source: <http://www.leginfo.ca.gov/calaw.html>)

Code Section	Description
Government Code Section 8870-8870.95	Creates Seismic Safety Commission.
Government Code Section 8876.1-8876.10	Established the California Center for Earthquake Engineering Research.
Public Resources Code Section 2800-2804.6	Authorized a prototype earthquake prediction system along the central San Andreas fault near the City of Parkfield.
Public Resources Code Section 2810-2815	Continued the Southern California Earthquake Preparedness Project and the Bay Area Regional Earthquake Preparedness Project.
Health and Safety Code Section 16100-16110	The Seismic Safety Commission and State Architect will develop a state policy on acceptable levels of earthquake risk for new and existing state-owned buildings.
Government Code Section 8871-8871.5	Established the California Earthquake Hazards Reduction Act of 1986.
Health and Safety Code Section 130000-130025	Defined earthquake performance standards for hospitals.
Public Resources Code Section 2805-2808	Established the California Earthquake Education Project.
Government Code Section 8899.10-8899.16	Established the Earthquake Research Evaluation Conference.
Public Resources Code Section 2621-2630 2621.	Established the Alquist-Priolo Earthquake Fault Zoning Act.
Government Code Section 8878.50-8878.52 8878.50.	Created the Earthquake Safety and Public Buildings Rehabilitation Bond Act of 1990.
Education Code Section 35295-35297 35295.	Established emergency procedure systems in kindergarten through grade 12 in all the public or private schools.
Health and Safety Code	Established standards for seismic retrofitting of

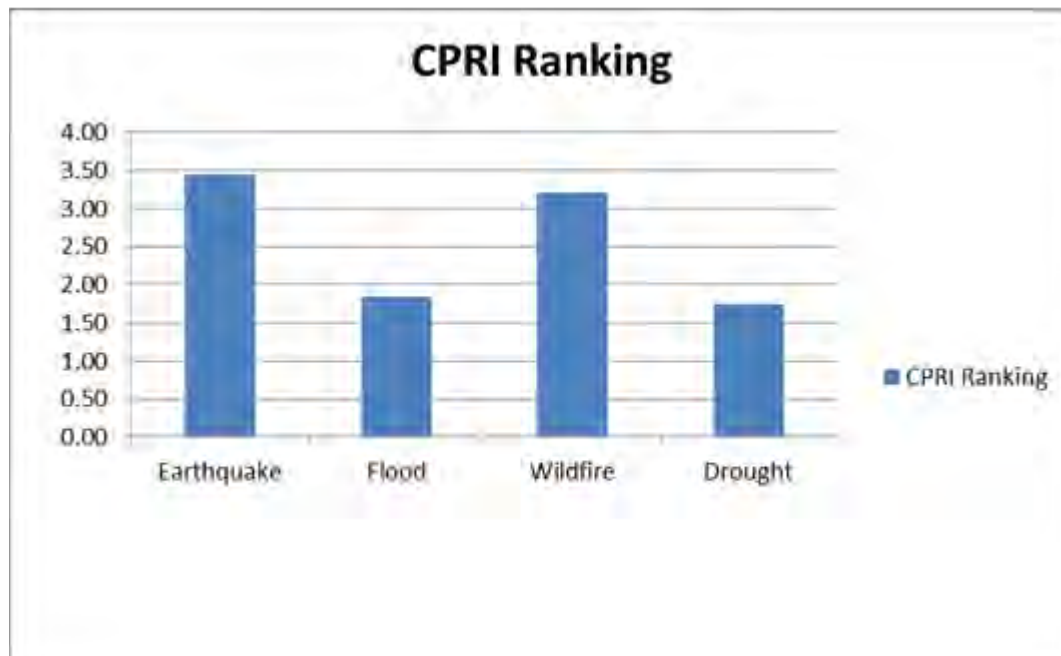


Code Section	Description
Section 19160-19169	unreinforced masonry buildings.
Health and Safety Code Section 1596.80-1596.879	Required all child day care facilities to include an Earthquake Preparedness Checklist as an attachment to their disaster plan.

Earthquake Education

Earthquake research and education activities are conducted at several major universities in the Southern California region, including Cal Tech, USC, UCLA, UCI, and UCSB. The local clearinghouse for earthquake information is the Southern California Earthquake Center (SCEC) located at the University of Southern California, Los Angeles, CA 90089, Telephone: (213) 740-5843, Fax: (213) 740-0011, Email: SCEinfo@usc.edu, Website: <http://www.scec.org>. SCEC is a community of scientists and specialists who actively coordinate research on earthquake hazards at nine core institutions, and communicate earthquake information to the public. SCEC is a National Science Foundation (NSF) Science and Technology Center and is co-funded by the United States Geological Survey (USGS).

Section 5: Flood Hazards



Previous Occurrences of Flooding in the City of Whittier*

The City of Whittier most recently experienced destruction due to flooding in 1995, impacting various areas city-wide. In addition to flooding and damage, storms were responsible for large volumes of debris. The City sought and received a Presidential Disaster Declaration to obtain federal assistance for its recovery effort. This flooding event caused \$15,000 worth of damage to public facilities.

Historic Flooding in Southern California

Los Angeles County records reveal since 1861, the Los Angeles River has flooded 30 times, on average once every 6.1 years. But averages are deceiving, for the Los Angeles basin goes through periods of drought and then periods of above average rainfall. Between 1889 and 1891 the river flooded every year, from 1941 to 1945, the river flooded 5 times. Conversely, from 1896 to 1914, and again from 1944 to 1969, a period of 25 years, the river did not have serious floods.

Average annual precipitation in Los Angeles County ranges from 13 inches on the coast to approximately 40 inches on the highest point of the Peninsular Mountain Range that transects the county. Several factors determine the severity of floods, including rainfall intensity and duration. A large amount of rainfall over a short time span can result in flash flood conditions. A

* ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2

B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))



sudden thunderstorm or heavy rain, dam failure, or sudden spills can cause flash flooding. The National Weather Service's definition of a flash flood is a flood occurring in a watershed where the time of travel of the peak of flow from one end of the watershed to the other is less than six hours.

The towering mountains that give the Los Angeles region its spectacular views also wring a great deal of rain out of the storm clouds that pass through. Because the mountains are so steep, the rainwater moves rapidly down the slopes and across the coastal plains on its way to the ocean.

"The Santa Monica, Santa Susana and Verdugo Mountains, which surround three sides of the valley, seldom reach heights above three thousand feet. The western San Gabriel Mountains, in contrast, have elevations of more than seven thousand feet. These higher ridges often trap eastern-moving winter storms. Although downtown Los Angeles averages just fifteen inches of rain a year, some mountain peaks in the San Gabriel's receive more than forty inches of precipitation annually, as much as many locations in the humid eastern United States" (Source: The Los Angeles River: It's Life, Death, and Possible Rebirth, Gumprecht 2001).

Naturally, this rainfall moves rapidly downstream, often with severe consequences for anything in its path. In extreme cases, flood-generated debris flows will roar down a canyon at speeds near 40 miles per hour with a wall of mud, debris and water, tens of feet high. Flooding occurs when climate, geology, and hydrology combine to create conditions where water flows outside of its usual course.

Table: Historical Records of Large Floods in Los Angeles County
(Source: National Climatic Data Center)

Date	Loss Estimation	Source of Estimate	Comments
1995	\$50 million	National Oceanic and Atmospheric Association	Flash Flood
1995	\$50 thousand	National Oceanic and Atmospheric Association	Flood/Flash Flood
2005	\$1 million	National Oceanic and Atmospheric Association	Flash Flood

Flooding Characteristics

Flooding occurs when climate, geology, and hydrology combine to create conditions where water flows outside of its usual course.

Winter Rainfall

Over the last 125 years, the average annual rainfall in Los Angeles County is 14.9 inches. But the term "average" means very little as the annual rainfall during this time period has ranged from only 4.35 inches in 2001-2002 to 38.2 inches in 1883-1884. In fact, in only fifteen of the past 125 years, has the annual rainfall been within plus or minus 10% of the 14.9 inch average.



And in only 38 years has the annual rainfall been within plus or minus 20% of the 14.9 inch average. This makes the Los Angeles basin a land of extremes in terms of annual precipitation.

Monsoons

Another relatively regular source for heavy rainfall, particularly in nearby mountains and foothills, is from summer tropical storms. These tropical storms usually coincide with El Niño years.

Flood Risk Factors

El Niño

El Niño is a disruption of the ocean-atmosphere system in the tropical Pacific having important consequences. Among these consequences is increased rainfall across the southern tier of the US and in Peru, which has caused destructive flooding, and drought in the West Pacific, sometimes associated with devastating brush fires in Australia. Observations of conditions in the tropical Pacific are considered essential for the prediction of short term (a few months to 1 year) climate variations.

El Niño (Spanish name for the male child), initially referred to a weak, warm current appearing annually around Christmas time along the coast of Ecuador and Peru, and lasting only a few weeks, to a month or more. Every three to seven years, an El Niño event can last for many months, having significant economic and atmospheric consequences worldwide. During the past forty years, ten of these major El Niño events have been recorded, the worst of which occurred in 1997-1998. Previous to this, the El Niño event in 1982-1983 was the strongest. Some of the El Niño events have persisted more than one year.

In August 2015, the Los Angeles Times reported that the strengthening of El Niño conditions in the Pacific Ocean has the potential to become one of the most powerful on record, as warming ocean waters surge toward the Americas, setting up a pattern that could bring once-in-a-generation storms to California late in the fall of 2015 or early winter of 2016, as predicted by the National Weather Service's Climate Prediction Center. A host of observations have led scientists to conclude that "collectively, these atmospheric and oceanic features reflect a significant and strengthening El Niño.

Severity

Floods threaten life and property. People and animals can drown; structures and their contents destroyed; roads, bridges, and railroad tracks can be washed out; and crops ruined. Floods can create health hazards due to the discharge of raw sewage from damaged septic tank leach fields, sewer lines, and sewage treatment plants; or due to hazardous materials carried off by raging waters.

Geography and Geology

Southern California is the product of rainstorms and erosion occurring over millennia. Most of the mountains surrounding the valleys and coastal plain are deeply fractured faults. As the mountains grew taller, their brittle slopes eroded. Rivers and streams carried boulders, rocks,



gravel, sand, and silt down these slopes to the valleys and coastal plain. Today, much of the coastal plain rests on the ancient rock debris and sediment washed down from the mountains.

This sediment can act like a sponge, absorbing vast quantities of rain in years when heavy rains follow a dry period. Like a sponge near saturation, the same soil fills up rapidly when heavy rain follows a period of relatively wet weather. Even so, in some years of heavy rain, flooding is minimal because the ground is relatively dry, yet the same amount of rain following a wet period causes extensive flooding.

Essentially all of Los Angeles County is built out leaving little open land to absorb rainfall. The lack of open land forces water to remain on the surface rapidly accumulating. If it were not for the massive flood control system with its concrete lined river and streambeds, flooding would occur more frequently. In addition, the tendency is toward less and less open land. In-fill building is becoming a much more common practice in many areas. Developers tear down an older home, typically covering up to 40 percent of the lot, replacing the single home with three or four town homes or apartments covering 90-95 percent of the lot.

Another potential source of flooding is “asphalt creep”. The street space between the curbs of a street is a part of the flood control system. When water leaves property and accumulates in the street, it is directed toward the underground portion of the flood control system. The carrying capacity of the street is determined by the width of the street and the height of the curbs along the street. Often, when resurfacing streets, a one to two inch layer of asphalt is laid over the existing asphalt. This added layer of asphalt subtracts from the rated capacity of the street to carry water. Thus, the original engineered capacity of the entire storm drain system is marginally reduced over time. Subsequent re-paving of the street will further reduce the engineered capacity even more.

Flood Terminology

Floodplain

A floodplain is a land area adjacent to a river, stream, lake, estuary, or other water body that is subject to flooding. This area, if left undisturbed, acts to store excess flood water. The floodplain is made up of two sections: the floodway and the flood fringe.

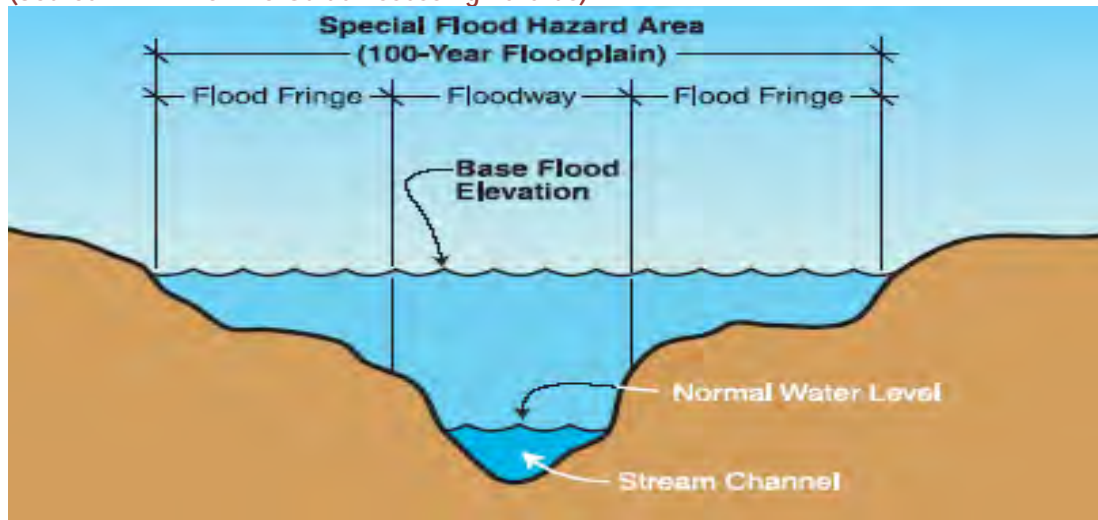
100-Year Flood

The 100-year flooding event is the flood having a one percent chance of being equaled or exceeded in magnitude in any given year. Contrary to popular belief, it is not a flood occurring once every 100 years. The 100-year floodplain is the area adjoining a river, stream, or watercourse covered by water in the event of a 100-year flood. Schematic: Floodplain and Floodway shows the relationship of the floodplain and the floodway.

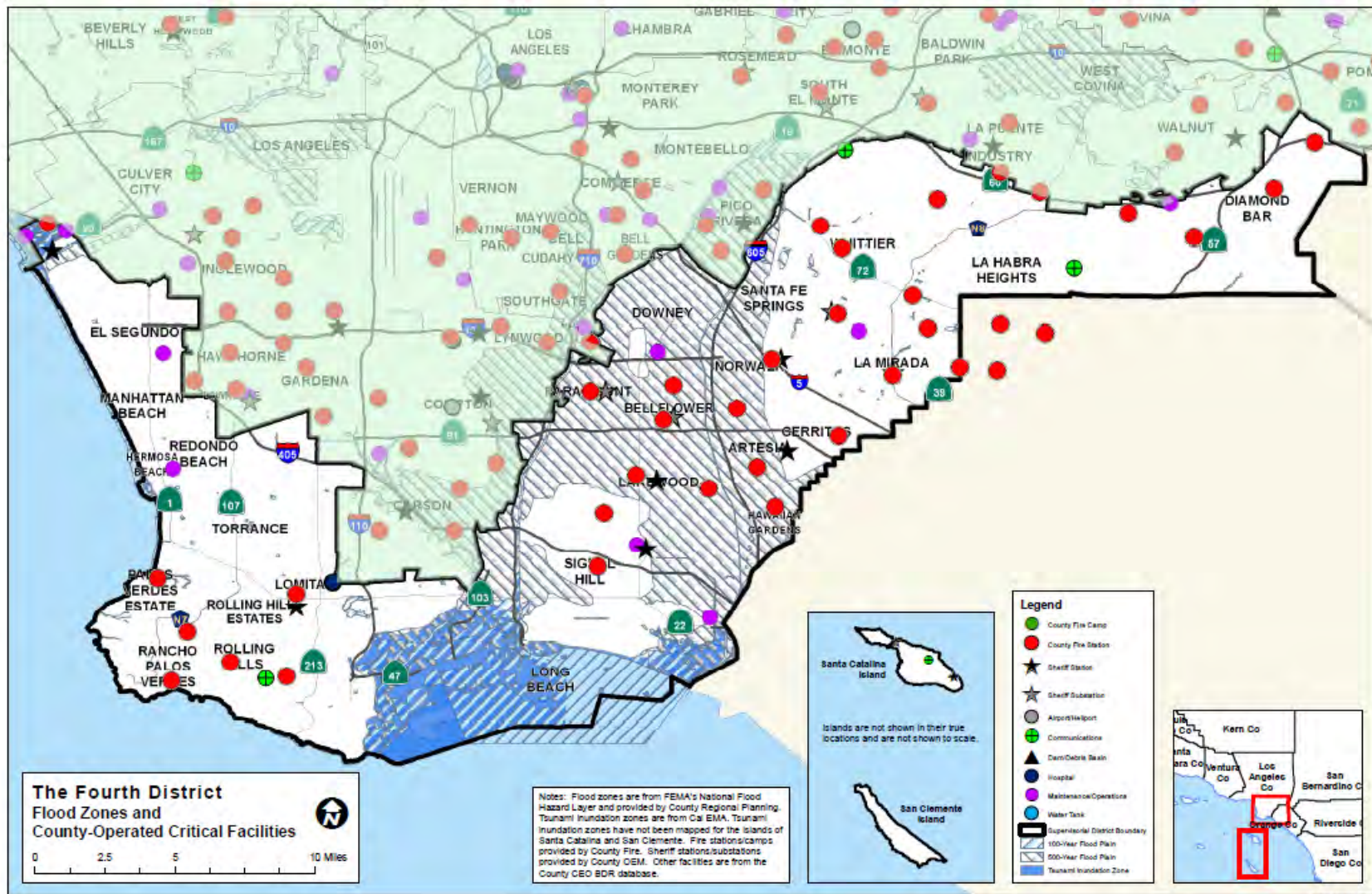
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is the flood having a 1%
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exceeded in magnitude in
any given year.

Contrary to popular belief,
it is not a flood occurring
once every 100 years.

Schematic: Floodplain and Floodway
(Source: FEMA How-To-Guide Assessing Hazards)



Map: Flood Zones and County-Operated Critical Facilities, District 4
(Source: County of Los Angeles Chief Executive Office - GIS)





Floodway

The floodway is one of two main sections that make up the floodplain. Floodways are defined for regulatory purposes. Unlike floodplains, floodways do not reflect a recognizable geologic feature. For NFIP purposes, floodways are defined as the channel of a river or stream, and the overbank areas adjacent to the channel. The floodway carries the bulk of the flood water downstream and is usually the area where water velocities and forces are the greatest. NFIP regulations require that the floodway be kept open and free from development or other structures that would obstruct or divert flood flows onto other properties.

Base Flood Elevation (BFE)

The term "Base Flood Elevation" refers to the elevation (normally measured in feet above sea level) that the base flood is expected to reach. Base flood elevations can be set at levels other than the 100-year flood. Some communities use higher frequency flood events as their base flood elevation for certain activities, while using lower frequency events for others. For example, for the purpose of storm water management, a 25-year flood event might serve as the base flood elevation; while the 500-year flood event serves as base flood elevation for the tie down of mobile homes. The regulations of the NFIP focus on development in the 100-year floodplain.

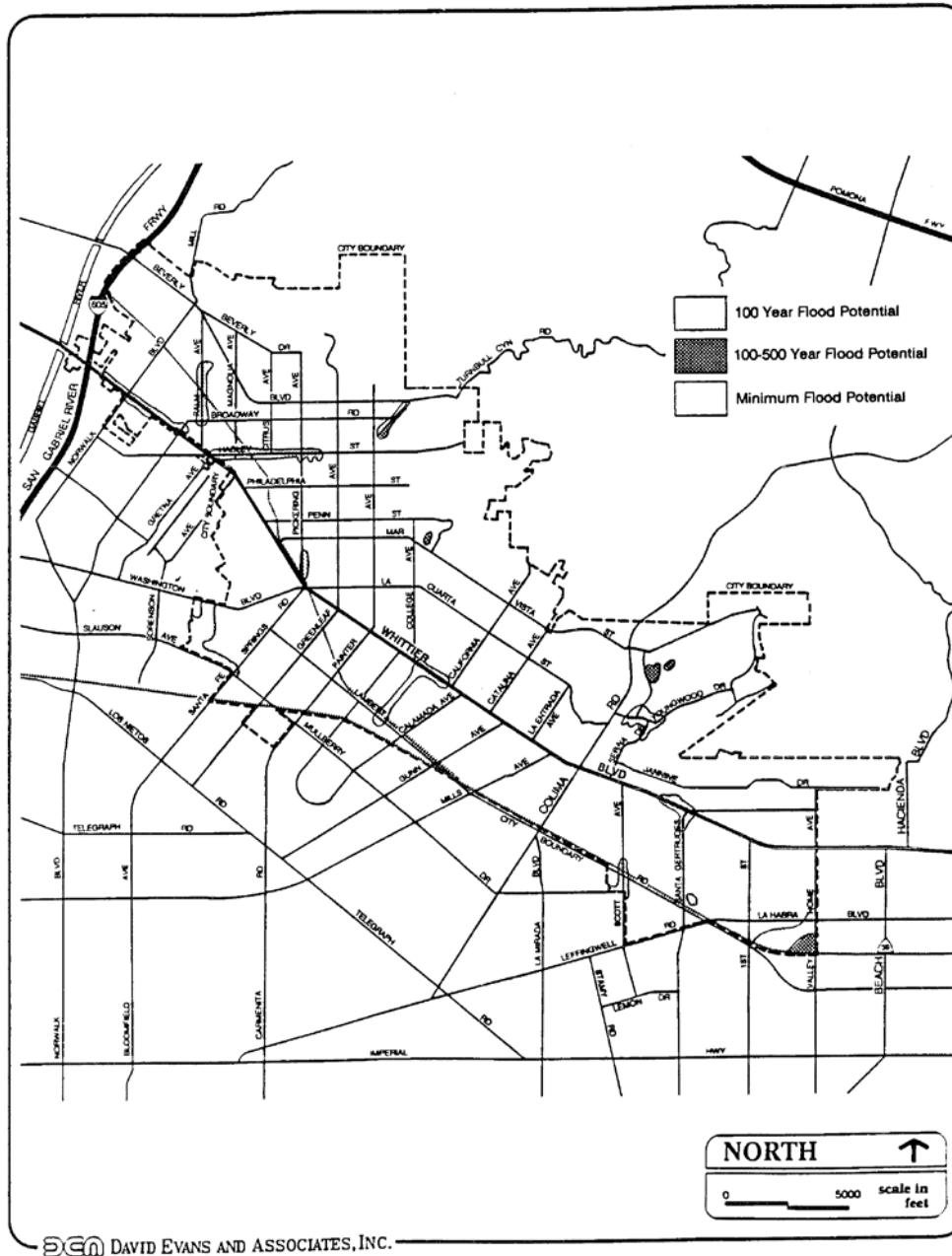
Types of Flooding

Two types of flooding primarily affect the City of Whittier: slow-rise or flash flooding. Slow-rise floods may be preceded by a warning period of hours or days. Evacuation and sandbagging for slow-rise floods have often effectively lessened flood related damage. Conversely, flash floods are most difficult to prepare for, due to extremely limited, if any, advance warning and preparation time. Unlike most of California, the areas of Los Angeles County that are subject to slow-rise flooding are not associated with overflowing rivers, aqueducts, canals or lakes.

Slow-rise flooding in Whittier has usually resulted from one or a combination of the following factors: extremely heavy rainfall, saturated soil, area recently burned in wild fires with inadequate new ground cover growth, or heavy rainfall with runoff from melting mountain snow.



Map: Whittier Flood Hazards
(Source: City of Whittier Background Report to the General Plan)



Urban Flooding

As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Urbanization of a watershed changes the hydrologic systems of the basin. Heavy rainfall collects and flows faster on impervious concrete and asphalt surfaces. The water



moves from the clouds, to the ground, and into streams at a much faster rate in urban areas. Adding these elements to the hydrological systems can result in flood waters that rise very rapidly and peak with violent force.

The City has a high concentration of impermeable surfaces that either collect water or concentrate the flow of water in unnatural channels. During periods of urban flooding, streets can become swift moving rivers and basements can fill with water. Storm drains often back up with vegetative debris causing additional, localized flooding.

Riverine Flooding

Riverine flooding is the overbank flooding of rivers and streams. The natural processes of riverine flooding add sediment and nutrients to fertile floodplain areas. Flooding in large river systems typically results from large-scale weather systems that generate prolonged rainfall over a wide geographic area, causing flooding in hundreds of smaller streams, which then drain into the major rivers. Shallow area flooding is a special type of riverine flooding. FEMA defines shallow flood hazards as areas that are inundated by the 100-year flood with flood depths of only one to three feet. These areas are generally flooded by low velocity sheet flows of water.

Dam Failure Flooding

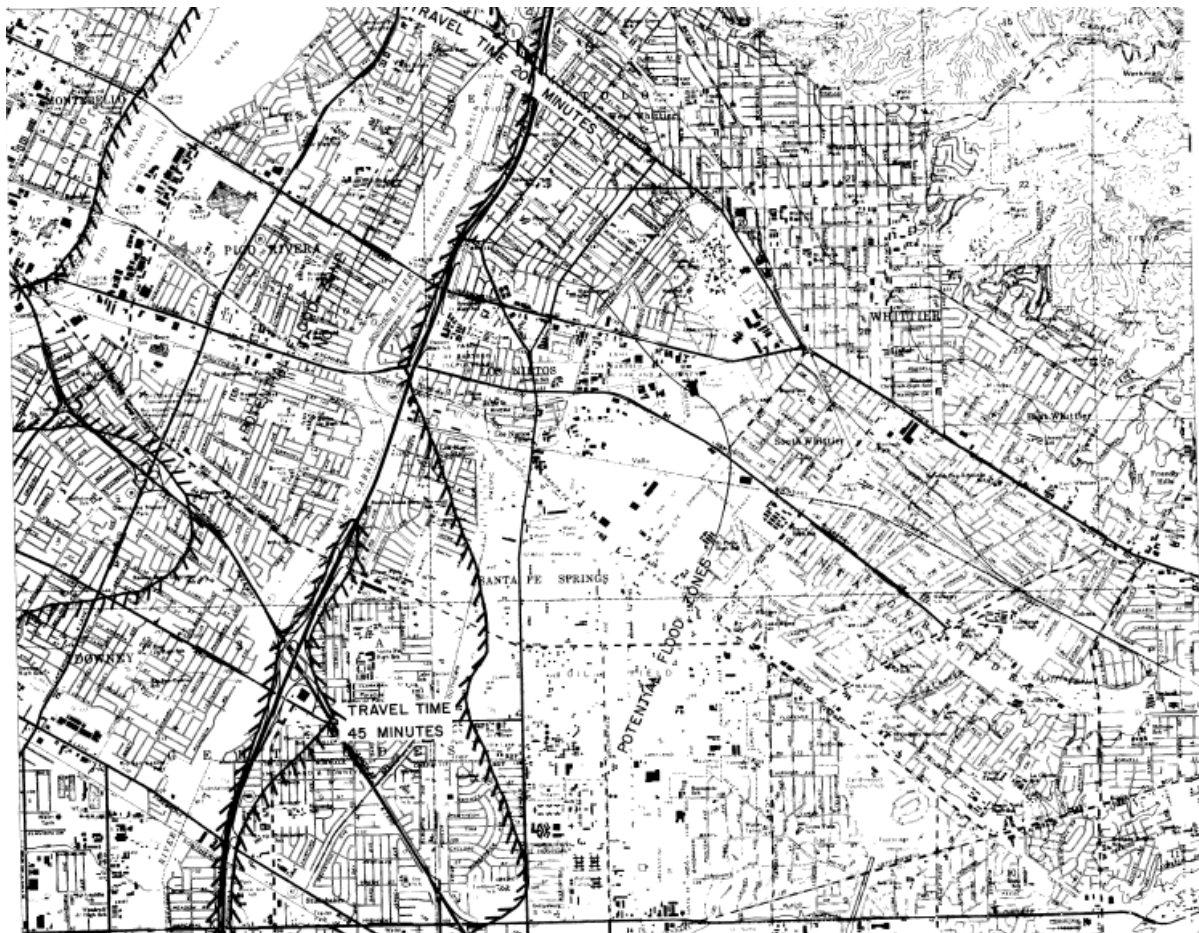
Loss of life and damage to structures, roads, and utilities may result from a dam failure. Economic losses can also result from a lowered tax base and lack of utility profits. As identified in the City's General Plan, within the City limits there are four reservoirs located above the city in the Puente Hills that potentially pose a flood hazard. The other three reservoirs at high elevations are Painter Reservoir, Greenleaf I Reservoir, and Ocean View Reservoir. In addition, there is also the newly constructed Greenleaf II Reservoir. There are several other water tanks located throughout the City, but they pose very minor flood hazards.

The Whittier Narrows Dam is located approximately 4 miles northwest of the City center. It is west of the San Gabriel River flood control channel and the Freeway (SR-605). The dam holds 9.75 million gallons of water. According to the City's General Plan, inundation from flood waters released from the Whittier Narrows Dam includes a limited area of low populated areas in the northwest corner of the City (essentially the City's Wellfield and water pumping plant).

Because dam failure can have severe consequences, FEMA requires that all dam owners develop Emergency Action Plans (EAP) for warning, evacuation, and post-flood actions. Although there may be coordination with county officials in the development of the EAP, the responsibility for developing potential flood inundation maps and facilitation of emergency response is the responsibility of the dam owner.

The potential for Dam inundation resulting from a break in a catastrophic failure of the Whittier Narrows Dam is shown in Map: Whittier Narrow Dam Inundation.

Map: Whittier Narrows Dam Inundation
(Source: California Division of Dam Safety)





What is the Effect of Development on Floods?

When structures or fill are placed in the floodway or floodplain, water is displaced. Development raises the river levels by forcing the river to compensate for the flow space obstructed by the inserted structures and/or fill. When structures or materials are added to the floodway or floodplain and no fill is removed to compensate, serious problems can arise. Flood waters may be forced away from historic floodplain areas. As a result, other existing floodplain areas may experience flood waters that rise above historic levels. Displacement of only a few inches of water can mean the difference between no structural damage occurring in a given flood event, and the inundation of many homes, businesses, and other facilities. Careful attention should be given to development that occurs within the floodway to ensure that structures are prepared to withstand base flood events. In highly urbanized areas, increased paving can lead to an increase in volume and velocity of runoff after a rainfall event, exacerbating the potential flood hazards. Care should be taken in the development and implementation of storm water management systems to ensure that these runoff waters are dealt with effectively.

Flood Insurance Rate Maps (FIRM) and Flood Insurance Studies (FIS) Floodplain maps are the basis for implementing floodplain regulations and for delineating flood insurance purchase requirements.

How are Flood-Prone Areas Identified?

Flood maps and Flood Insurance Studies (FIS) are often used to identify flood-prone areas. The NFIP was established in 1968 as a means of providing low-cost flood insurance to the nation's flood-prone communities. The NFIP also reduces flood losses through regulations that focus on building codes and sound floodplain management. NFIP regulations (44 Code of Federal Regulations Chapter 1, Section 60, 3) require that all new construction in floodplains must be elevated at or above base flood level.

FIRM and FIS Floodplain maps are the basis for implementing floodplain regulations and for delineating flood insurance purchase requirements. A FIRM is the official map produced by FEMA which delineates Special Flood Hazard Area (SFHA) in communities where NFIP regulations apply. FIRMs are also used

by insurance agents and mortgage lenders to determine if flood insurance is required and what insurance rates should apply.

Water surface elevations are combined with topographic data to develop FIRMs. FIRMs illustrate areas that would be inundated during a 100-year flood, floodway areas, and elevations marking the 100-year-flood level. In some cases, they also include BFEs and areas located within the 500-year floodplain.

Flood Insurance Studies and FIRMs produced for the NFIP provide assessments of the probability of flooding at a given location. FEMA conducted many Flood Insurance Studies in the late 1970s and early 1980s. These studies and maps represent flood risk at the point in time when FEMA completed the studies. However, it is important to note that not all 100-year or 500-year floodplains have been mapped by FEMA.



*NFIP Participation**

The City of Whittier participates in NFIP. Unfortunately, FEMA flood maps are not entirely accurate because they are updated so infrequently. These studies and maps represent flood risk at the point in time when FEMA completed the studies, and does not incorporate planning for floodplain changes in the future due to new development. Although FEMA is considering changing that policy, it is optional for local communities. The FEMA FIRM maps for the City of Whittier were last updated in 2009. The FEMA FIRM maps below represent the current status of the FIRM maps. Human-caused and natural changes to the environment have changed the dynamics of storm water run-off since then.

SFHAs are areas at or below a flood elevation that has a one percent or greater probability of being equaled or exceeded during any given year (this is also known as a 100-year flood event). This flood, which is referred to as the base flood, is the national standard on which the floodplain management and insurance requirements of the NFIP are based.

Definitions of FEMA Flood Zone Designations

FEMA has identified three flood zones within the City of Whittier: Zone “A”, Zone “B”, and Zone “C”. See charts below for definitions.

Flood zones are geographic areas that the FEMA has defined according to varying levels of flood risk. These zones are depicted on a community's Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map. Each zone reflects the severity or type of flooding in the area.

Moderate to Low Risk Areas

In communities that participate in the NFIP, flood insurance is available to all property owners and renters in these zones:

ZONE	DESCRIPTION
B and X (shaded)	Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods. B Zones are also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.
C and X (unshaded)	Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level. Zone C may have ponding and local drainage problems that don't warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100-year flood.

*** ELEMENT C. MITIGATION STRATEGY | C2**

C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))



High Risk Areas

In communities that participate in the NFIP, mandatory flood insurance purchase requirements apply to all of these zones:

ZONE	DESCRIPTION
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
A1-30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AO	River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
A99	Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.

Undetermined Risk Areas

ZONE	DESCRIPTION
D	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.







Flood Mapping Methods and Techniques

Although many communities rely exclusively on FIRMs to characterize the risk of flooding in their area, there are some flood-prone areas that are not mapped but remain susceptible to flooding. These areas include locations next to small creeks, local drainage areas, and areas susceptible to manmade flooding.

Communities find it particularly useful to overlay flood hazard areas on tax assessment parcel maps. This allows a community to evaluate the flood hazard risk for a specific parcel during review of a development request. Coordination between FEMA and local planning jurisdictions is the key to making a strong connection with GIS technology for the purpose of flood hazard mapping.

Coordination between FEMA and local planning jurisdictions is the key to making a strong connection with GIS technology for the purpose of flood hazard mapping.

Flood Hazard Assessment

Hazard Identification

Hazard identification is the first phase of a hazard assessment. Identification is the process of estimating: 1) the geographic extent of the floodplain (i.e., the area at risk from flooding); 2) the intensity of the flooding that can be expected in specific areas of the floodplain; and 3) the probability of occurrence of flood events. This process usually results in the creation of a floodplain map. Floodplain maps provide detailed information that can assist jurisdictions in making policies and land-use decisions.

Vulnerability Assessment

Vulnerability assessment is the second phase of a flood-hazard assessment. It combines the floodplain boundary, generated through hazard identification, with an inventory of the property within the floodplain. Understanding the population and property exposed to hazards will assist in reducing risk and preventing loss from future events. Because site-specific inventory data and inundation levels given for a particular flood event (10-year, 25-year, 50-year, 100-year, and 500-year) are not readily available, calculating a community's vulnerability to flood events is not straightforward. The amount of property in the floodplain, as well as the type and value of structures on those properties, should be calculated to provide a working estimate for potential flood losses.

Risk Analysis

Risk analysis is the third and most advanced phase of a flood hazard assessment. It builds upon the hazard identification and vulnerability assessment. A flood risk analysis for the City of Whittier should include two components: 1) the life and value of property that may incur losses from a flood event (defined through the vulnerability assessment); and 2) the number and type of flood events expected to occur over time. Within the broad components of a risk analysis, it is possible to predict the severity of damage from a range of events. Flow velocity models assist in predicting the amount of damage expected from different magnitudes of flood events.



Local Conditions

Based on floodplain maps, the areas in Whittier that are more likely to be flooded can be identified. It is also possible to pinpoint the effects of certain flood events on individual properties. At the time of publication of this Plan, data was insufficient to conduct a full risk analysis for flood events in the City of Whittier. Insurance estimates for City-owned property give insight into the potential costs that could be incurred should severe flooding occur. This Plan includes recommendations for building partnerships that will support the development of a flood risk analysis in the City of Whittier.

The size and frequency of a flood in a particular area, depends on a complex combination of conditions, including the amount, intensity, and distribution of rainfall previous moisture condition and drainage patterns.

The magnitude of a flood is measured in terms of its peak discharge, which is the maximum volume of water passing a point along a channel in a given amount of time, usually expressed in cubic feet per second (cfs). Floods are usually referred to in terms of their chance of occurrence. For example, a 100-year flood has a 1% chance of occurring in any given year.

The Federal Emergency Management Agency (FEMA) establishes base flood heights and inundation areas for 100-year and 500-year flood zones. The 100-year flood zone is defined as the area that could be inundated by the flood which has a one percent probability of occurring in any given year. The 500-year flood is defined as the flood which has a 0.2 percent probability of occurring in any given year.

The City participates in the National Flood Insurance Program (NFIP). Created by Congress in 1968, the NFIP makes flood insurance available in communities that enact minimum floodplain management rules consistent with the Code of Federal Regulations §60.3.

Impact of Flooding in the City of Whittier*

Floods and their impacts vary by location and severity of any given flood event, and likely only affect certain areas of the county during specific times. Based on the risk assessment, it is evident that floods will continue to have devastating economic impact to certain areas of the City.

Impact that is not quantified, but anticipated in future events includes:

- ✓ Injury and loss of life;
- ✓ Commercial and residential structural damage;
- ✓ Disruption of and damage to public infrastructure;
- ✓ Secondary health hazards e.g. mold and mildew
- ✓ Damage to roads/bridges resulting in loss of mobility
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community

* ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))



- ✓ Negative impact on commercial and residential property values and
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.

Property Loss Resulting from Flooding Events

The type of property damage caused by flood events depends on the depth and velocity of the flood waters. Faster moving flood waters can wash buildings off their foundations and sweep cars downstream. Pipelines, bridges, and other infrastructure can be damaged when high waters combine with flood debris. Extensive damage can be caused by basement flooding and landslide damage related to soil saturation from flood events. Most flood damage is caused by water saturating materials susceptible to loss (i.e., wood, insulation, wallboard, fabric, furnishings, floor coverings, and appliances). In many cases, flood damage to homes renders them unlivable.

*Repetitive Loss Properties**

Repetitive Loss Properties (RLPs) are most susceptible to flood damages; therefore, they have been the focus of flood hazard mitigation programs. Unlike a countywide program, the Floodplain Management Plan (FMP) for repetitive loss properties involves highly diversified property profiles, drainage issues, and property owner's interest. It also requires public involvement processes unique to each RLP area. The objective of an FMP is to provide specific potential mitigation measures and activities to best address the problems and needs of communities with repetitive loss properties. A repetitive loss property is one for which two or more claims of \$1,000 or more have been paid by the National Flood Insurance Program (NFIP) within any given ten-year period. According to FEMA and the County of Los Angeles Flood Mitigation Plan, there are no Repetitive Loss Properties within the City of Whittier.

Business/Industry

Flood events impact businesses by damaging property and by interrupting business. Flood events can cut off customer access to a business as well as close a business for repairs. A quick response to the needs of businesses affected by flood events can help a community maintain economic vitality in the face of flood damage. Responses to business damages can include funding to assist owners in elevating or relocating flood-prone business structures.

Public Infrastructure

Publicly owned facilities are a key component of daily life for all citizens of the county. Damage to public water and sewer systems, transportation networks, flood control facilities, emergency facilities, and offices can hinder the ability of the government to deliver services. Government can take action to reduce risk to public infrastructure from flood events, as well as craft public policy that reduces risk to private property from flood events.

*** ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B4**

B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))



Roads

During hazard events, or any type of emergency or disaster, dependable road connections are critical for providing emergency services. Roads systems in Whittier are maintained by multiple jurisdictions. Federal, state, county, and city governments all have a stake in protecting roads from flood damage. Road networks often traverse floodplain and floodway areas.

Transportation agencies responsible for road maintenance are aware of roads at risk from flooding.

Bridges

Bridges are key points of concern during flood events because they are important links in road networks and they can be obstructions in watercourses, inhibiting the flow of water during flood events. The bridges in Whittier are state, county, city, or privately owned. A state-designated inspector must inspect all state, county and city bridges every two years; but private bridges are not inspected, and can be very dangerous. The inspections are rigorous, looking at everything from seismic capability to erosion and scour.

Storm Water Systems

Local urban flooding and isolated drainage problems are common throughout the Whittier. The City's Public Works Department staff is aware of local drainage threats. The problems are often present where storm water runoff enters culverts or goes underground into storm sewers. Inadequate maintenance can also contribute to the flood hazard in the urbanized areas.



Debris in the Storm Drains

Storm water pollution is urban runoff water that picks up pollutants as it flows through the storm drain system – a network of channels, gutters and pipes that collect runoff from city streets, neighborhoods, agricultural areas, construction sites and parking lots – and empties directly into local waterways.

Unlike sewage, which goes to treatment plants, urban runoff flows untreated through the storm drain system. Anything thrown, swept or poured into the street, gutter or a catch basin – the curbside openings that lead into the storm drain system – can flow directly into our channels, creeks, bays and ocean. This includes pollutants like trash, pet waste, cigarette butts, motor oil, anti-freeze, runoff from pesticides and fertilizers, paint from brushes and containers rinsed in the gutter, and toxic household chemicals.

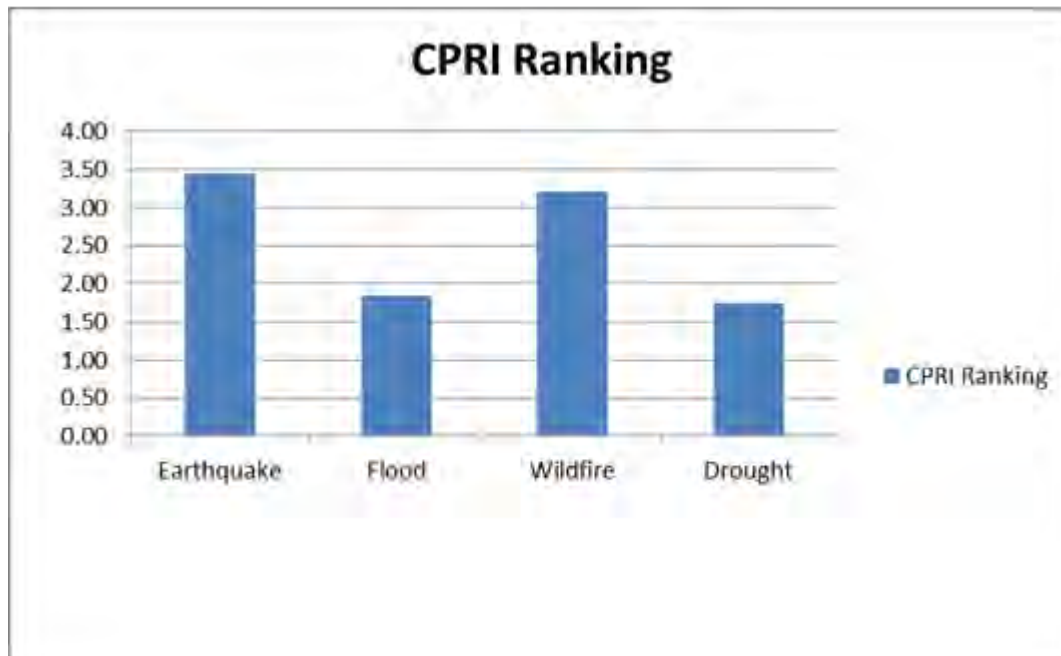
Water/Wastewater Treatment Facilities

The City of Whittier receives its water services from its own water system for most of the City as well as Suburban Water Company. Wastewater treatment services are provided at the Los Coyotes Treatment Facility run by the Los Angeles County Sanitation Districts.

Water Quality

Environmental quality problems include bacteria, toxins, and pollution. The City of Whittier has high levels of nitrates within the water system from time to time but always within regulatory limits.

Section 6: Wildfire Hazards



Previous Occurrences of Wildfires in the City of Whittier*

Wildfires present a substantial hazard to life and property in communities built within or adjacent to hillsides and mountainous along Whittier's northern boundary.

In the fall of 1967, hills near Whittier College experienced wildfire that advanced to within one hill away from the College. There was severe smoke and roads were closed, but there were no structures involved. In the early 1980's, Turnbull Canyon in the Puente Hills experienced wildfire, but no homes were lost. Turnbull Canyon again experienced wildfire in 1990. The houses that were lost were in the unincorporated county area of Hacienda Heights.

Why are Wildfires a Threat to the City of Whittier?

A wildfire is an uncontrolled fire spreading through vegetative fuels and exposing or possibly consuming structures. They often begin unnoticed and spread quickly. Naturally occurring and non-native species of grasses, brush, and trees fuel wildfires. A wildland fire is a wildfire in an area in which development is essentially nonexistent, except for roads, railroads, power lines and similar facilities. A Wildland/Urban Interface Fire is a wildfire in a geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels.

* ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2

B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

People start more than 80 percent of wildfires, usually as debris burns, arson, or carelessness. Lightning strikes are the next leading cause of wildfires. Wildfire behavior is based on three primary factors: fuel, topography, and weather. The type, and amount of fuel, as well as its burning qualities and level of moisture affect wildfire potential and behavior. The continuity of fuels, expressed in both horizontal and vertical components is also a determinant of wildfire potential and behavior. Topography is important because it affects the movement of air (and thus the fire) over the ground surface. The slope and shape of terrain can change the speed at which the fire travels, and the ability of firefighters to reach and extinguish the fire. Weather affects the probability of wildfire and has a significant effect on its behavior. Temperature, humidity and wind (both short and long term) affect the severity and duration of wildfires. Los Angeles County's topography, consisting of a semi-arid coastal plain and rolling highlands, when fueled by shrub overgrowth, occasional Santa Ana winds and high temperatures, creates an ever-present threat of wildland fire. Extreme weather conditions such as high temperature, low humidity, and/or winds of extraordinary force may cause an ordinary fire to expand into one of massive proportions.



For thousands of years, fires have been a natural part of the ecosystem in Southern California. However, wildfires present a substantial hazard to life and property in communities built within or adjacent to hillsides and mountainous areas. There is a huge potential for losses due to wildland/urban interface fires in Southern California. According to the California Division of Forestry (CDF), there were over seven thousand reportable fires in California in 2003, with over one million acres burned. According to CDF statistics, in the October 2003 Firestorms, over 4,800 homes were destroyed and 24 lives were lost.

In late October 2007, Southern California experienced an unusually severe fire weather event characterized by intense, dry, gusty Santa Ana winds. This weather event drove a series of destructive wildfires that took a devastating toll on people, property, natural resources, and infrastructure. Although some fires burned into early November, the heaviest damage occurred during the first three days of the siege when the winds were the strongest.

The 2009 Station Fire was the most recent wildfire to impact the Los Angeles region. Although there was no damage or impact to the City of Whittier, costs included personnel responses in the form of mutual aid.

Historic Fires in Southern California

Large fires have been part of the Southern California landscape for millennia. Written documents reveal that during the 19th century human settlement of southern California altered the fire regime of coastal California by increasing the fire frequency. This was an era of very limited fire suppression, and yet like today, large crown fires covering tens of thousands of acres were not uncommon. One of the largest fires in Los Angeles County (60,000 acres) occurred in 1878.

Table: Southern California's Largest Wildfires
(Source: CALFIRE Top 20 Largest California Wildfire 2014)

Destructive Fires in California History					
Fire Name	Date	County	Acres	Structures	Deaths
Cedar	October 2003	San Diego	273,246	2,820	14
Zaca	July 2007	Santa Barbara	240,207	1	0
Matilija	September 1932	Ventura	220,000	0	0
Witch	October 2007	San Diego	197,990	1,650	2
Laguna	September 1970	San Diego	175,425	382	5
Day	September 2006	Ventura	162,702	11	0
Station	August 2009	Los Angeles	160,557	209	2
Wheeler	July 1985	Ventura	118,000	26	0
Simi	October 2003	Ventura	108,204	300	0



The 2003 Southern California Fires

The fall of 2003 marked the most destructive wildfire season in California history. In a ten day period, 12 separate fires raged across Southern California in Los Angeles, Riverside, San Bernardino, San Diego and Ventura counties. The massive "Cedar Fire" in San Diego County alone consumed 2,800 homes and burned over a quarter of a million acres.

In October 2003, Southern California experienced the most devastating wildland fire disaster in state history. Over 739,597 acres burned; 3,631 homes, 36 commercial properties, and 1,169 outbuildings were destroyed; 246 people were injured; and 24 people died, including one firefighter. At the height of the siege, 15,631 personnel were assigned to fight the fires.



(Source: State of California, *Governor's Blue Ribbon Panel Fire Commission Report to the Governor, 2004*)

Table: October 2003 Firestorm Statistics

(Source: http://www.fire.ca.gov/php/fire_er_content/downloads/2003LargeFires.pdf)

County	Fire Name	Date Began	Acres Burned	Homes Lost	Homes Damaged	Lives Lost
Riverside	Pass	10/21/03	2,397	3	7	0
Los Angeles	Padua	10/21/03	10,446	59	0	0
San Bernardino	Grand Prix	10/21/03	69,894	136	71	0
San Diego	Roblar 2	10/21/03	8,592	0	0	0
Ventura	Piru	10/23/03	63,991	8	0	0
Los Angeles	Verdale	10/24/03	8,650	1	0	0
Ventura	Simi	10/25/03	108,204	300	11	0
San Diego	Cedar	10/25/03	273,246	2,820	63	14
San Bernardino	Old	10/25/03	91,281	1,003	7	6
San Diego	Otay / Mine	10/26/03	46,000	6	11	0
Riverside	Mountain	10/26/03	10,000	61	0	0
San Diego	Paradise	10/26/03	56,700	415	15	2
Total Losses			749,401	4,812	185	22

The 2007 Southern California Fires

In late October 2007, Southern California experienced an unusually severe fire weather event characterized by intense, dry, gusty Santa Ana winds. This weather event drove a series of destructive wildfires that took a devastating toll on people, property, natural resources, and infrastructure. Although some fires burned into early November, the heaviest damage occurred during the first three days of the siege when the winds were the strongest.



During this siege, 17 people lost their lives, ten were killed by the fires outright, three were killed while evacuating, four died from other fire siege related causes, and 140 firefighters, and an unknown number of civilians were injured. A total of 3,069 homes and other buildings were destroyed, and hundreds more were damaged. Hundreds of thousands of people were evacuated at the height of the siege. The fires burned over half a million acres, including populated areas, wildlife habitat and watershed. Portions of the electrical power distribution



network, telecommunications systems, and even some community water sources were destroyed. Transportation was disrupted over a large area for several days, including numerous road closures. Both the Governor of California and the President of the United States personally toured the ongoing fires. Governor Schwarzenegger proclaimed a state of emergency in seven counties before the end of the first day. President Bush quickly declared a major disaster. While the total impact of the 2007 fire siege was less than the disastrous fires of 2003, it was unquestionably one of the most devastating wildfire events in the history of California. (Source: http://www.fire.ca.gov/fire_protection/downloads/siege/2007/Overview_Introduction.pdf)

Wildfire Characteristics

There are three categories wildland/urban interface fire: The classic wildland/urban interface exists where well-defined urban and suburban development presses up against open expanses of wildland areas; the mixed wildland/urban interface is characterized by isolated homes, subdivisions, and small communities situated predominantly in wildland settings. The occluded wildland/urban interface exists where islands of wildland vegetation occur inside a largely urbanized area. Certain conditions must be present for significant interface fires to occur. The most common conditions include: hot, dry and windy weather; the inability of fire protection forces to contain or suppress the fire; the occurrence of multiple fires that overwhelm committed resources; and a large fuel load (dense vegetation). Once a fire has started, several conditions influence its behavior, including fuel topography, weather, drought, and development.



Southern California has two distinct areas of risk for wildland fire. The foothills and lower mountain areas are most often covered with scrub brush or chaparral. The higher elevations of mountains also have heavily forested terrain. The lower elevations covered with chaparral create one type of exposure.

“Past fire suppression is not to blame for causing large shrub land wildfires, nor has it proven effective in halting them.” said Dr. Jon Keeley, a USGS fire researcher who studies both southern California shrub lands and Sierra Nevada forests. “Under Santa Ana conditions, fires carry through all chaparral regardless of age class. Therefore, prescribed burning programs over large areas to remove old stands and maintain young growth as bands of firebreaks resistant to ignition are futile at stopping these wildfires.” (Source: http://www.usgs.gov/public/press/public_affairs/press_releases/pr1805m.html)

The higher elevations of Southern California’s mountains are typically heavily forested. The magnitude of the 2003 fires is the result of three primary factors: (1) severe drought, accompanied by a series of storms that produce thousands of lightning strikes and windy conditions; (2) an infestation of bark beetles that has killed thousands of mature trees; and (3) the effects of wildfire suppression over the past century that has led to buildup of brush and small diameter trees in the forests.



"When Lewis and Clark explored the Northwest, the forests were relatively open, with 20 to 25 mature trees per acre. Periodically, lightning would start fires that would clear out underbrush and small trees, renewing the forests. Today's forests are completely different, with as many as 400 trees crowded onto each acre, along with thick undergrowth. This density of growth makes forests susceptible to disease, drought and severe wildfires. Instead of restoring forests, these wildfires destroy them and it can take decades to recover. This radical change in our forests is the result of nearly a century of well-intentioned but misguided management." (Source: Overgrown Forests Require Preventive Measures, By Gale A. Norton (Secretary of the Interior), USA Today Editorial, August 21, 2002)

The Interface

One challenge Southern California faces regarding the wildfire hazard is from the increasing number of houses being built on the urban/wildland interface. Every year the growing population expands further into the hills and mountains, including forest lands. The increased "interface" between urban/suburban areas, and the open spaces created by this expansion, produces a significant increase in threats to life and property from fires, and pushes existing fire protection systems beyond original or current design and capability. Property owners in the interface are not aware of the problems and fire hazards or risks on their own property. Furthermore, human activities increase the incidence of fire ignition and potential damage.

Fuel

Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is classified by volume and by type. Volume is described in terms of "fuel loading," or the amount of available vegetative fuel.

The type of fuel also influences wildfire. Chaparral is a primary fuel of Southern California wildfires. Chaparral habitat ranges in elevation from near sea level to over 5,000' in Southern California. Chaparral communities experience long dry summers and receive most of their annual precipitation from winter rains. Although chaparral is often considered as a single species, there are two distinct types; hard chaparral and soft chaparral. Within these two types are dozens of different plants, each with its own particular characteristics.

The northern boundary of Whittier is composed of chaparral land, especially in the foothills.

An important element in understanding the danger of wildfire is the availability of diverse fuels in the landscape, such as natural vegetation, manmade structures and combustible materials. A house surrounded by brushy growth rather than cleared space allows for greater continuity of fuel and increases the fire's ability to spread. After decades of fire suppression "dog-hair" thickets have accumulated, which enable high intensity fires to flare and spread rapidly.

Topography

Topography influences the movement of air, thereby directing a fire course. For example, if the percentage of uphill slope doubles, the rate of spread in wildfire will likely double. Gulches and canyons can funnel air and act as chimneys, which intensify fire behavior and cause the fire to spread faster. Solar heating of dry, south-facing slopes produces up slope drafts that can complicate fire behavior. Unfortunately, hillsides with hazardous topographic characteristics are also desirable residential areas in many communities. This underscores the need for wildfire



hazard mitigation and increased education and outreach to homeowners living in interface areas.

Weather

Weather patterns combined with certain geographic locations can create a favorable climate for wildfire activity. Areas where annual precipitation is less than 30 inches per year are extremely fire susceptible. High-risk areas in Southern California share a hot, dry season in late summer and early fall when high temperatures and low humidity favor fire activity. The so-called “Santa Ana” winds, which are heated by compression as they flow down to Southern California from Utah, create a particularly high risk, as they can rapidly spread what might otherwise be a small fire.

Drought

Recent concerns about the effects of climate change, particularly drought, are contributing to concerns about wildfire vulnerability. The term ‘drought’ is applied to a period in which an unusual scarcity of rain causes a serious hydrological imbalance. Unusually dry winters, or significantly less rainfall than normal, can lead to relatively drier conditions and leave reservoirs and water tables lower. Drought leads to problems with irrigation and contributes to additional fires, or increased difficulty in fighting fires.

Development

Growth and development in scrubland and forested areas is increasing the number of human-caused structures in Southern California interface areas. Wildfire affects development, yet development can also influence wildfire. Owners often prefer homes that are private with scenic views, nestled in vegetation, and use natural materials. A private setting is usually far from public roads, or hidden behind a narrow, curving driveway. These conditions, however, make evacuation and firefighting difficult. The scenic views found along mountain ridges can also mean areas of dangerous topography. Natural vegetation contributes to scenic beauty, but it may also provide a ready trail of fuel leading a fire directly to the combustible fuels of the home itself.

Wildfire Hazard Assessment

Hazard Identification

Extreme weather conditions such as high temperature, low humidity, and/or winds of extraordinary force causes an ordinary fire to expand into one of massive proportions.

Wildfire hazard areas are commonly identified in regions of the wildland/urban interface. Ranges of the wildfire hazard are further determined by the ease of fire ignition due to natural or human conditions and the difficulty of fire suppression. The wildfire hazard is also magnified by several factors related to fire suppression/control such as the surrounding fuel load, weather, topography, and property characteristics.

Generally, hazard identification rating systems are based on weighted factors of fuels, weather and topography. In order to determine the “base hazard factor” of specific wildfire hazard sites

and interface regions, several factors must be taken into account. Categories used to assess the base hazard factor include:

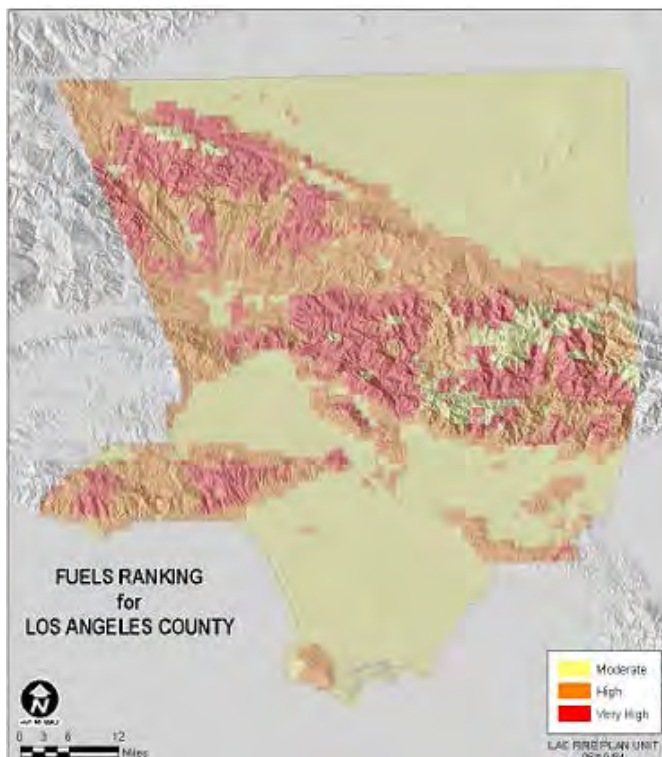
- ✓ Topographic location, characteristics and fuels
- ✓ Site/building construction and design
- ✓ Site/region fuel profile (landscaping)
- ✓ Defensible space
- ✓ Accessibility
- ✓ Fire protection response
- ✓ Water availability

Vulnerability Assessment

The use of Geographic Information System (GIS) technology in recent years is a great asset to fire hazard assessment, allowing further integration of fuels, weather and topography data for such ends as fire behavior prediction, watershed evaluation, mitigation strategies and hazard mapping.

Large facilities (particularly schools and other facilities with vulnerable populations) located near the Wildland/Urban Interface must incorporate adequate evacuation planning into their Site Emergency Plans. Fire drills and fire evacuation routes should be pre-planned and practiced with transportation vehicles and shelter locations pre-planned.

Map: Los Angeles County Fire Hazard Map
(Source: County of Los Angeles All-Hazards Mitigation Plan)





Risk Analysis

Southern California residents are served by a variety of local fire departments as well as county, state and federal fire resources. Data that includes the location of interface areas in the county can be used to assess the population and total value of property at risk from wildfire and direct these fire agencies in fire prevention and response.

Key factors included in assessing wildfire risk include ignition sources, building materials and design, structural density, slope, vegetative fuel, fire occurrence and weather, as well as occurrences of drought.

The National Wildland/Urban Fire Protection Program has developed the Wildland/Urban Fire Hazard Assessment Methodology tool for communities to assess their risk to wildfire. For more information on wildfire hazard assessment refer to <http://www.Firewise.org>.

Fire hazards of concern in the City of Whittier are those associated with structures and brush, as well as earthquake induced fires. Fire potential is typically greatest in the months of August, September, and October, when dry vegetation, combined with offshore dry Santa Ana winds, create a high potential for spontaneous fires. The hillsides and steep slopes facilitate rapid fire spread.

Local Conditions

Fire hazards threaten lives, property, and natural resources, and impact vegetation and wildlife habitats.

Weather

Weather conditions have many complex and important effects on fire intensity and behavior. Wind is of prime importance; as wind increases in velocity, the rate of fire spread also increases. Relative humidity (i.e., relative dryness of the air) also has a direct effect, the drier the air, and the drier the vegetation; the more likely the vegetation will ignite and burn. Precipitation (annual total, seasonal distribution and storm intensity) further affects the moisture content of dead and living vegetation, which influences fire ignition and behavior.

In addition to winds, structural development within or adjacent to wildland exposures represents an extreme fire protection problem due to flying embers and the predominance of combustible roof coverings.

Topography

Topography affects wildland fire behavior, and the ability of firefighters and their equipment to take action to suppress those fires. One example is a fire starting in the bottom of a canyon may expand quickly to the ridge top before initial attack forces can arrive. Rough topography greatly limits road construction, road standards, and accessibility by ground equipment. Steep topography also channels airflow, creating extremely erratic winds on lee slopes and in canyons. Water supply for fire protection to structures at higher elevations is frequently dependent on pumping units. The source of power for such units is usually from overhead distribution lines, which are subject to destruction by wildland fires.



Vegetation

A key to effective fire control and the successful accommodation of fire in wildland management is the understanding of fire and its environment. Fire environment is the complex of fuel, topographic, and air mass factors, that influence the inception, growth, and behavior of a fire. The topography and weather components are, for all practical purposes, beyond man's control, but it is a different story with fuels, which can be controlled before the outbreak of fires. In terms of future urban expansion, finding new ways to control and understand these fuels can lead to possible fire reduction.

Of these different vegetation types, coastal sage scrub, chaparral, and grasslands reach some degree of flammability during the dry summer months and, under certain conditions, during the winter months. For example, as chaparral gets older, twigs and branches within the plants die and are held in place. A stand of brush 10- to 20-years of age usually has enough dead material to produce rates of spread about the same as in grass fires when the fuels have dried out. In severe drought years, additional plant material may die, contributing to the fuel load. There will normally be enough dead fuel accumulated in 20- to 30-year old brush to give rates of spread about twice as fast as in a grass fire. Under moderate weather conditions that produce a spread rate of one-half foot per second in grass, a 20- to 30-year old stand of chaparral may have a rate of fire spread of about one foot per second. Fire spread in old brush (40 years or older) has been measured at eight times as fast as in grass, about four feet per second. Under extreme weather conditions, the fastest fire spread in grass is 12 feet per second or about eight miles per hour.

Community Wildfire Issues

What is Susceptible to Wildfires?

Los Angeles County Fire Department provides fire protection services to the City of Whittier. Map: City of Whittier Fire Hazard Severity Zones.

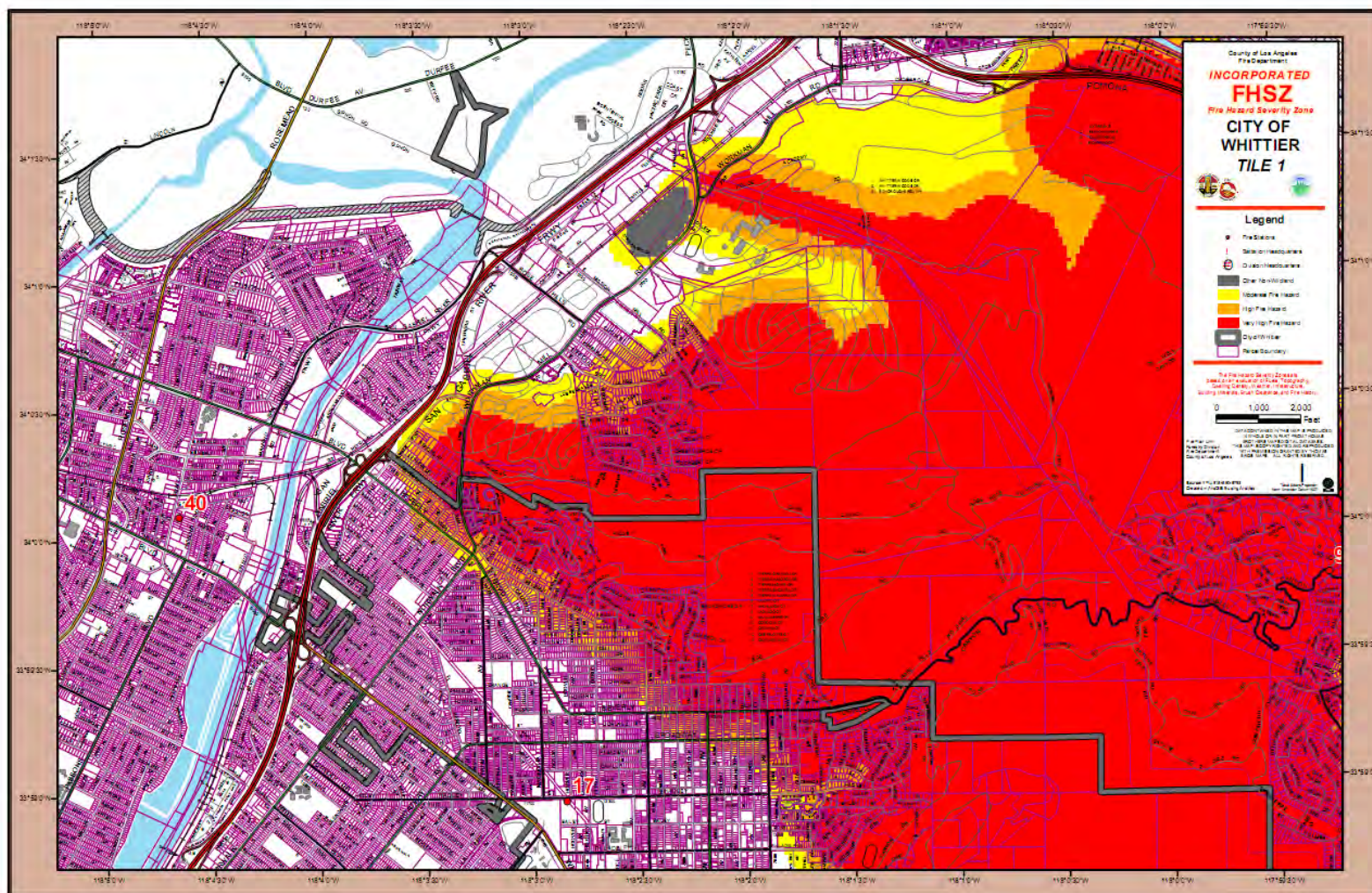
Defensible space can be created around structures by taking precautionary measures such as: Thinning trees and brush within a minimum of 30 feet of a home. Beyond 30 feet, remove dead wood, debris and low tree branches. Keeping lawns trimmed, leaves raked, and the roof and rain-gutters free from debris such as dead limbs and leaves. Stacking firewood at least 30 feet away from a home. Storing flammable materials, liquids and solvents in metal containers outside the home at least 30 feet away from structures and wooden fences.

In Whittier, this scenario highlights the need for fire mitigation activity in all sectors of the region, wildland/urban interface or not. Examples of actions homeowners can take to mitigate fires include:

- ✓ Define a defensible space of a 30-foot non-combustible buffer area around the house
- ✓ Reduce flammable vegetation, trees and brush around the house
- ✓ Remove or prune trees
- ✓ Cut grass and weeds regularly
- ✓ Relocate wood piles and leftover materials
- ✓ Keep it clean
- ✓ Install fire resistant roofing materials and spark arrestors on chimneys

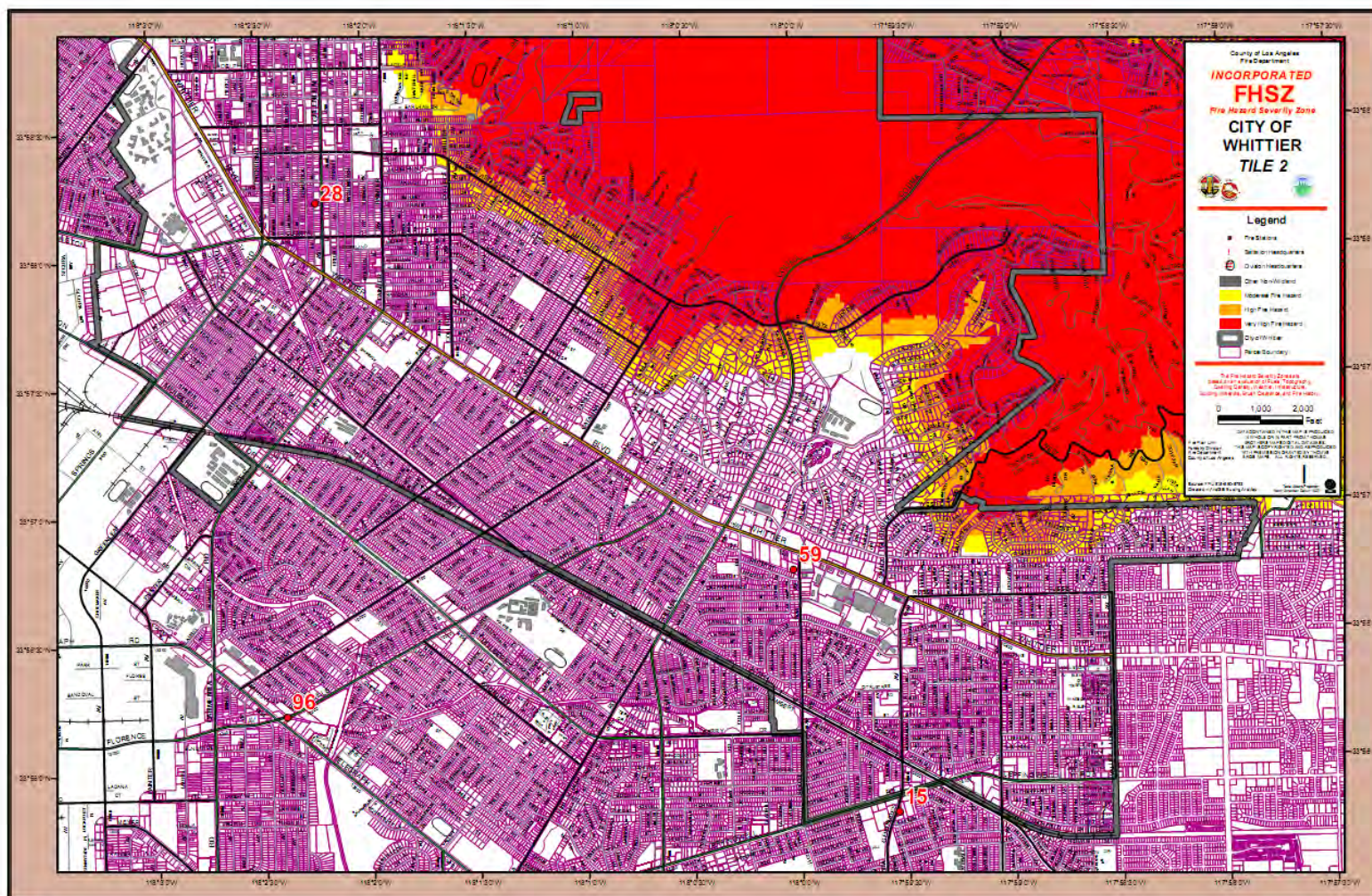


Map: City of Whittier Fire Hazard Severity Zones – Tile 1
(Source: ftp://frap.cdf.ca.gov/fhszlocalmaps/los_angeles/whittier.pdf)

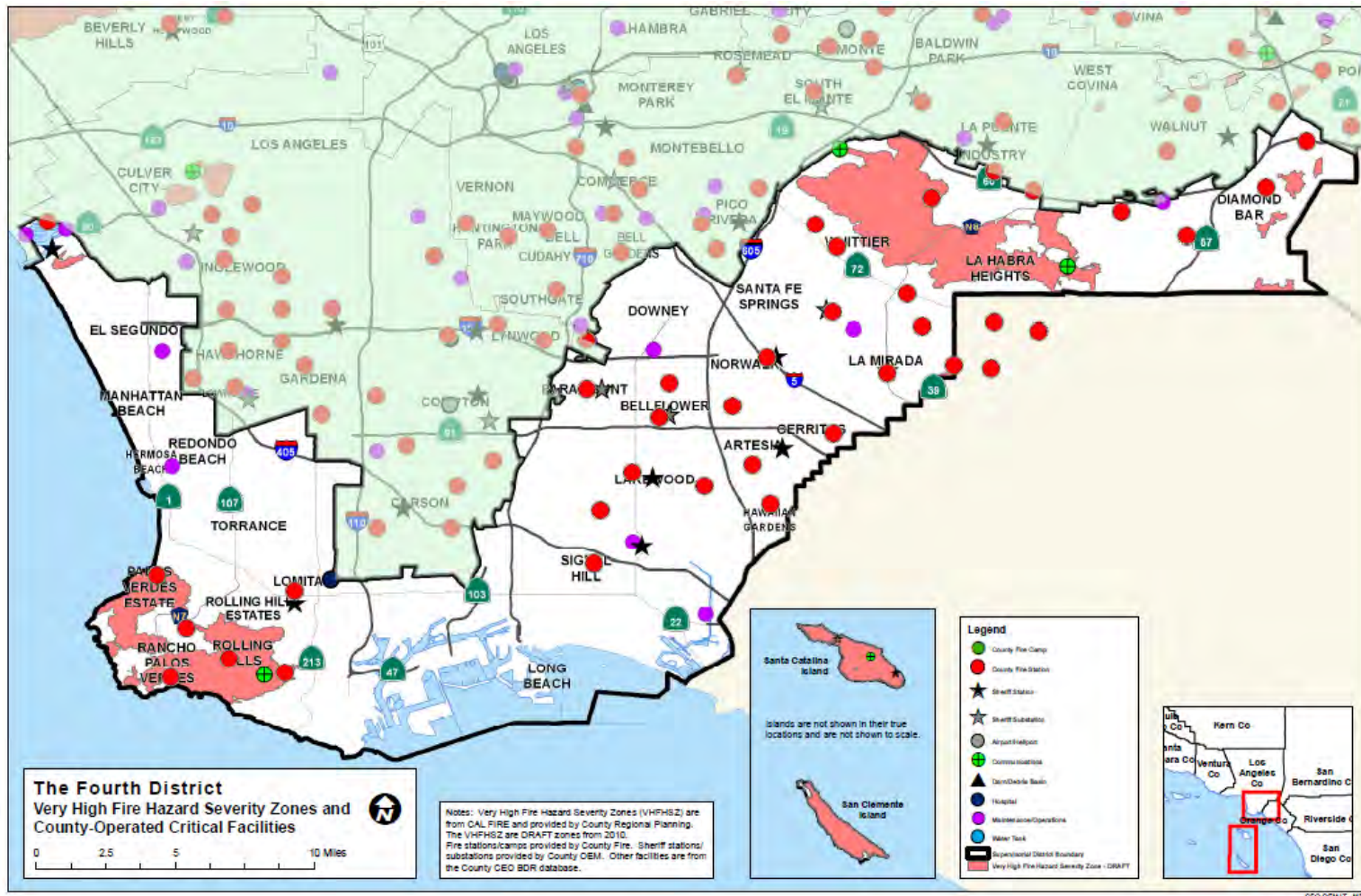




Map: City of Whittier Fire Hazard Severity Zones – Tile 2
(Source: ftp://frap.cdf.ca.gov/fhszlocalmaps/los_angeles/whittier.pdf)



Map: Very High Fire Hazard Severity Zones and Public Schools, District 4
(Source: County of Los Angeles Chief Executive Office - GIS)







Impact of Wildfires in the City of Whittier*

Wildfires and their impact varies by location and severity of any given wildfire event, and will likely only affect certain areas of the county during specific times. Based on the risk assessment, it is evident that wildfires will have potentially devastating economic impact to certain areas of the City. Impact that is not quantified, but can be anticipated in future events, includes:

- ✓ Injury and loss of life
- ✓ Commercial and residential structural damage
- ✓ Disruption of and damage to public infrastructure
- ✓ Secondary health hazards e.g. mold and mildew
- ✓ Damage to roads/bridges resulting in loss of mobility
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed

Severity

The primary effects of fire, such as loss of life, injury, destruction of buildings and wildlife, are generally well known. Fire also has a number of secondary effects, such as strained public utilities, depleted water supplies, downed power lines, disrupted telephone systems, and closed roads. In addition, flood control facilities are overtaxed by the increased flow from bare hillsides, and the resulting debris that washes down. Affected recreation areas may have to close or restrict operations. Moreover, buildings destroyed by fire are usually eligible for property tax reassessment, which reduces revenue to local government.

A fire is usually extinguished within a few days, but its effects last much longer. Grasslands re-sprout the following spring, a chaparral community regenerate in three to five years, and an oak woodland with most of its seedlings and saplings destroyed will start a new crop within five to ten years. Coniferous timber stands are most susceptible to long-term damage, taking as much as 50 to 100 years to reestablish a forest.

Fire destroys surface vegetation, leaving the soil bare and subject to erosion, when the rains begin in the fall and winter. Raindrops hit the surface with undiminished impact, splashing particles of soil loose that move downhill and are carried away by running water. Fire also destroys most of the roots that hold the soil in place, allowing running water to wash the soil away. Mudslides and mudflows can result from these processes.

* ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))



Growth and Development in the Interface

The hills and mountainous areas of Southern California are considered to be interface areas. The development of homes and other structures is encroaching onto the wildlands and is expanding the wildland/urban interface. The interface neighborhoods are characterized by a diverse mixture of varying housing structures, development patterns, ornamental and natural vegetation and natural fuels.

In the event of a wildfire, vegetation, structures and other flammables can merge into unwieldy and unpredictable events. Factors important to the fighting of such fires include access, firebreaks, proximity of water sources, distance from a fire station and available firefighting personnel and equipment. Reviewing past wildland/urban interface fires shows that many structures are destroyed or damaged for one or more of the following reasons:

- ✓ Combustible roofing material
- ✓ Wood construction
- ✓ Structures with no defensible space
- ✓ Fire department has poor access to structures
- ✓ Subdivisions located in heavy natural fuel types
- ✓ Structures located on steep slopes covered with flammable vegetation
- ✓ Limited water supply
- ✓ Winds over 30 miles per hour

Road Access

Road access is a major issue for all emergency service providers. As development encroaches into the rural areas of the county, the number of houses without adequate turn-around space is increasing. In many areas, there is not adequate space for emergency vehicle turnarounds in single-family residential neighborhoods, obstructing emergency workers because they cannot access houses. Fire trucks are large, and firefighters are challenged by narrow roads and limited access. When there is inadequate turn around space, the fire fighters can only work to remove the occupants, but cannot safely remain to save the threatened structures.

Water Supply

Fire fighters in remote and rural areas are faced by limited water supply and lack of hydrant taps. Rural areas are characteristically outfitted with small diameter pipe water systems, inadequate for providing sustained fire-fighting flows.

Interface Fire Education Programs and Enforcement

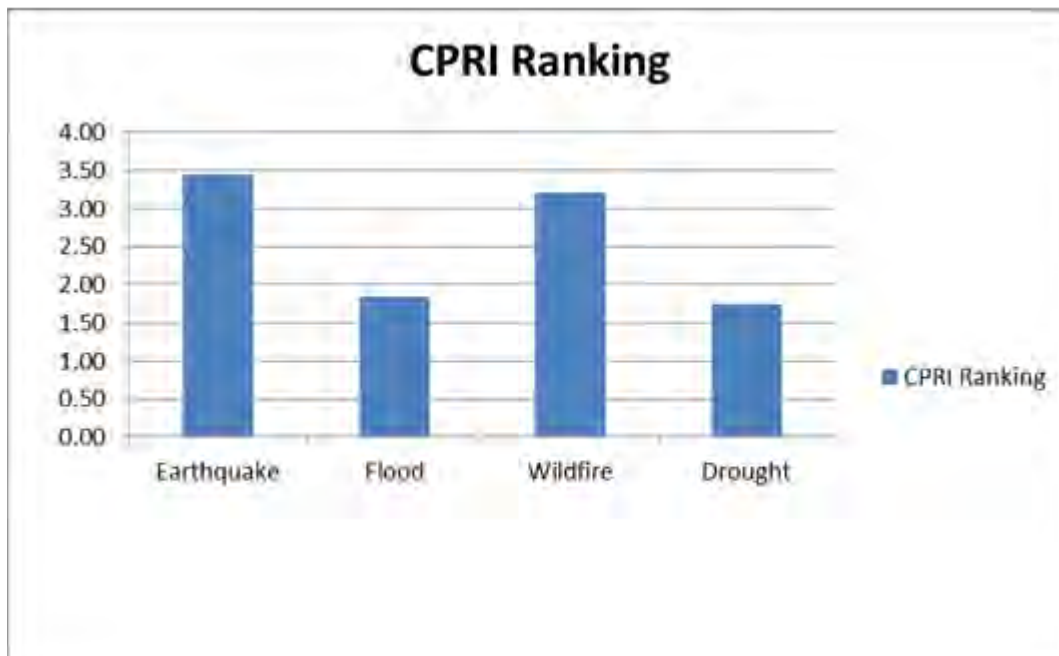
Fire protection in urban/wildland interface areas may rely heavily more on the landowner's personal initiative to take measures to protect his or her own property. Therefore, public education and awareness plays a greater role in interface areas. In those areas with strict fire codes, property owners who resist maintaining the minimum brush clearances can be cited for failure to clear brush.



The Need for Mitigation Programs

Continued development into the interface areas has growing impact on the wildland/urban interface. Periodically, the historical losses from wildfires in Southern California are catastrophic, with historical deadly and expensive fires. The continued growth and development increases the public need for mitigation planning in Southern California.

Section 7: Drought



Previous Occurrences of Drought in the City of Whittier*

Fortunately, there is no severe history of drought within the City of Whittier. However, because of increased state and regional concern for the possibility of a long-term drought, the City is actively encouraging and enforcing conservation. Following is the resolution passed by the City Council on May 15, 2015:

* ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2

B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))



Attachment: City Council Water Conservation Ordinance – May 15, 2015



City of Whittier 2015-16 Temporary Water Restrictions due to State-wide Emergency Drought Conditions

Whereas, the City of Whittier is an urban water supplier as defined in the California Water Code Section 10617 and the City provides water to a service area comprising approximately 65% of the City;

Whereas, the Governor of the State of California on January 17, 2014 issued a proclamation of a state of emergency under the California Emergency Services Act based on drought conditions, and on April 25, 2014 the Governor issued a proclamation of a continued state of emergency based on continued drought conditions;

Whereas, the California State Water Resources Control Board on July 15, 2014 adopted emergency regulations as California Code of Regulations, Title 23, Sections 863, 864, 865 for statewide urban water conservation;

Whereas, the California State Water Resources Control Board on March 17, 2015 adopted Resolution No. 2015-0013 which included the finding that the drought conditions that formed the basis of the Governor's emergency proclamations continue to exist and which adopted emergency regulations that extended and expanded requirements for water conservation and prohibition of certain water uses;

Whereas, the Governor of the State of California on April 1, 2015 issued Executive Order B-29-15 calling for a statewide 25% reduction in potable urban water usage through February 28, 2016;

Whereas, the California State Water Resources Control Board on May 5, 2015 adopted Revisions to the emergency regulations which implement certain provisions of Executive Order B-29-15 by modifying and expanding once again requirements for water conservation and prohibition of certain water uses;

Whereas, the City of Whittier has adopted City of Whittier Final 2010 Urban Water Management Plan (UWMP) which was updated on July 29, 2014 by the City Council's approval of Addendum No. 1, both UWMP and Addendum No. 1 having been prepared by Stetson Engineers, Inc. and both having been approved by the California Department of Water Resources;



Whereas, the UWMP contains a water shortage contingency analysis and provisions for reductions of water use during a water shortage; and

Whereas, Whittier Municipal Code Section 13.24.010, "Restrictions During Emergency", reads:

"Upon notice published in a daily paper in the city, the director of public works shall have the right to restrict the use of water for sprinkling, wetting, irrigation or construction purposes to such hours and for such time as may be deemed advisable. In the event of any emergency, the director of public works shall have the right, power and authority to turn off the water from any main or mains or pipes of the water system of the city with or without notice. The director of public works is enforced with power or authority to determine when an emergency exists and such discrimination shall be final or until revised at a meeting of the council. In addition to the power given in this section, the council reserves the right in the event of any emergency to turn off the water from any main or mains or pipes of the city either with or without notice and so long a time as the council may deem advisable."

NOW, THEREFORE, I, DAVID A. PELSER, DIRECTOR OF PUBLIC WORKS FOR THE CITY OF WHITTIER DETERMINE THAT:

1. Whittier Municipal Code Section 13.24.010 has empowered the Director of Public Works to determine when an emergency exists and to restrict the use of water for sprinkling, wetting, irrigation or construction purposes;
2. a water emergency exists as evidenced by the Governor's emergency proclamations and Executive Order noted above, and the State Water Resources Control Board emergency regulations apply to the City of Whittier urban water service area and require certain water use restrictions.

BASED ON THE AFOREMENTIONED DETERMINATION:

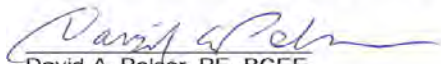
- A. Certain uses of water are hereby prohibited as follows, except where necessary to address an immediate health and safety need or to comply with a term or condition in a permit issued by a state or federal agency:
 1. The application of potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;
 2. The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use;



3. The application of potable water to driveways and sidewalks;
 4. The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system;
 5. The application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall;
 6. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;
 7. The irrigation with potable water of ornamental turf on public street medians; and
 8. The irrigation with potable water of landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.
- B. To promote water conservation, operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guestroom using clear and easily understood language.
- C. Outdoor irrigation of ornamental landscapes or turf with potable water by the persons it serves is limited to no more than three days per week. Customers with street addresses ending in an even number are restricted to outdoor irrigation on Mondays, Wednesdays and Saturdays; addresses ending in an odd number are restricted to outdoor irrigation on Tuesdays, Thursdays and Sundays. No outdoor irrigation is allowed on Fridays. Governmental organizations irrigating parks are restricted to irrigating three days per week but may select the specific three days.

These temporary water restrictions due to emergency drought conditions shall remain in effect as long as the State Water Resources Control Board emergency regulations shall remain in effect, or until the Director of Public Works determines that the emergency no longer exists, or until the City Council of the City of Whittier takes action to revise these restrictions.

EXECUTED THIS 15th DAY OF MAY, 2015, AT WHITTIER, CALIFORNIA.


David A. Pelsner, PE, BCEE
Director of Public Works



Hazard Identification and Risk Assessment

Definition

Drought is defined as a deficiency of precipitation over an extended period of time, usually a season or more. This deficiency results in a water shortage for some activity, group, or environmental sector. Drought should be considered relative to some long-term average condition of balance between precipitation and evapotranspiration (i.e., evaporation + transpiration) in a particular area, a condition often perceived as "normal". It is also related to the timing (e.g., principal season of occurrence, delays in the start of the rainy season, occurrence of rains in relation to principal crop growth stages) and the effectiveness of the rains (e.g., rainfall intensity, number of rainfall events). Other climatic factors such as high temperature, high wind, and low relative humidity are often associated with it in many regions of the world and can significantly aggravate its severity. Drought should not be viewed as merely a physical phenomenon or natural event. Its impacts on society result from the interplay between a natural event (less precipitation than expected resulting from natural climatic variability) and the demand people place on water supply. Human beings often exacerbate the impact of drought. Recent droughts in both developing and developed countries and the resulting economic and environmental impacts and personal hardships have underscored the vulnerability of all societies to this "natural" hazard.

One dry year does not normally constitute a drought in California, but serves as a reminder of the need to plan for droughts. California's extensive system of water supply infrastructure - its reservoirs, groundwater basins, and inter-regional conveyance facilities - mitigates the effect of short-term dry periods for most water users. Defining when a drought begins is a function of drought impacts to water users. Hydrologic conditions constituting a drought for water users in one location may not constitute a drought for water users elsewhere, or for water users having a different water supply. Individual water suppliers may use criteria such as rainfall/runoff, amount of water in storage, or expected supply from a water wholesaler to define their water supply conditions.

Many governmental utilities, the National Oceanic and Atmospheric Administration (NOAA), and the California Department of Water Resources, as well as academic institutions such as the University of Nebraska-Lincoln's National Drought Mitigation Center and the National Drought Mitigation Center, generally agree that there is no clear definition of drought. Drought is highly variable depending on location.

Drought Threat

The region's Mediterranean climate makes it especially susceptible to variations in rainfall. Though the potential risk to Whittier is in no way unique, severe water shortages could have a bearing on the economic well-being of the community. Comparison of climate (rainfall) records from Los Angeles with water well records beginning in 1930 from the San Gabriel Valley indicates the existence of wet and dry cycles on a 10-year scale as well as for much longer periods. The climate record for the Los Angeles region beginning in 1890 suggests drying conditions over the last century. With respect to the present day, climate data also suggests that the last significant wet period was the 1940s. Well level data and other sources seem to indicate the historic high groundwater levels (reflecting recharge from rainfall) occurred in the same decade. Since that time, rainfall (and groundwater level trends) appears to be in decline. This slight declining trend, however, is not believed to be significant. Climatologists compiled rainfall data from 96 stations in the State that spanned a 100-year period between 1890 and 1990. An interesting note is that during the first 50 years of the reporting period, there was only



one year (1890) that had more than 35 inches of rainfall, whereas the second 50 year period recording of 5 year intervals (1941, 1958, 1978, 1982, and 1983) that exceeded 35 inches of rainfall in a single year. The year of maximum rainfall was 1890 when the average annual rainfall was 43.11 inches. The second wettest year on record occurred in 1983 when the State's average was 42.75 inches.

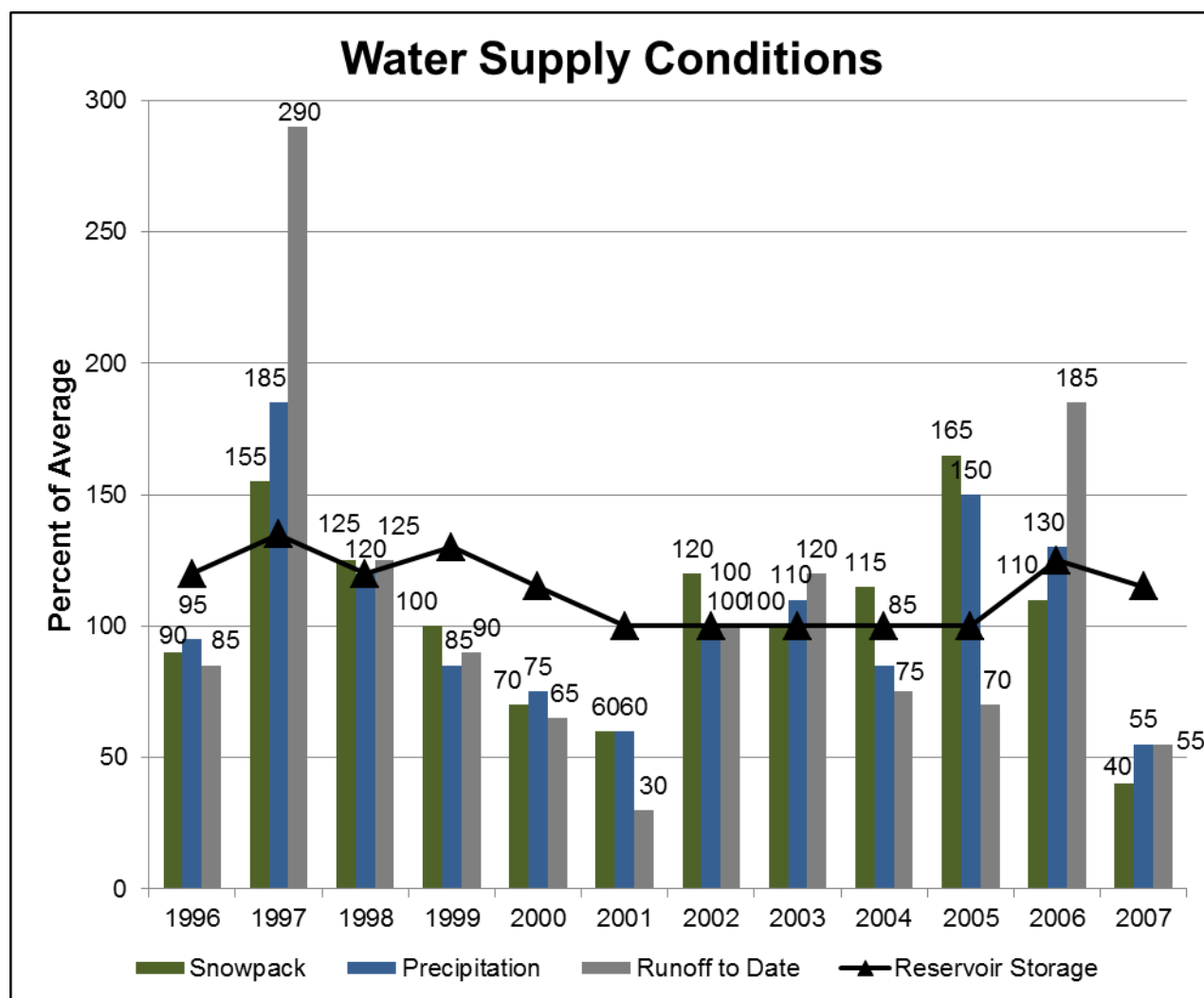
The driest year of the 100-year reported in the study was 1924 when the State's average rainfall was only 10.50 inches. The region with the most stations reporting the driest year in 1924 was the San Francisco Bay area. The second driest year was 1977 when the average was 11.57 inches. The most recent major drought (1987 to 1990) occurred at the end of a sequence of very wet years (1978 to 1983). The debate continues whether "global warming" is occurring, and the degree to which global climate change will have an effect on local micro-climates. The semi-arid southwest is particularly susceptible to variations in rainfall. A study that documented annual precipitation for California since 1600 from reconstructed tree ring data indicates that there was a prolonged dry spell from about 1755 to 1820 in California. Fluctuations in precipitation could contribute indirectly to a number of hazards including wildfire and the availability of water supplies.

General Situation

Figure: Water Supply Conditions below illustrates several indicators commonly used to evaluate California water conditions. The percent of average values are determined for measurement sites and reservoirs in each of the State's ten major hydrologic regions. Snow pack is an important indicator of runoff from Sierra Nevada watersheds, the source of much of California's developed water supply.



Figure: Water Supply Conditions
(Source: California Department of Water Resources)



Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multiyear period. There is no universal definition of when a drought begins or ends.

Impact of Wildfires in the City of Whittier*

Impacts of drought are typically felt first by those most reliant on annual rainfall: ranchers engaged in dry land grazing, rural residents relying on wells in low-yield rock formations, or

* ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))



small water systems lacking a reliable source. Criteria used to identify statewide drought conditions do not address these localized impacts. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline.

Types of Drought

There are four different ways that drought can be defined:

- (1) Meteorological - a measure of departure of precipitation from normal. Due to climatic differences what is considered a drought in one location may not be a drought in another location.
- (2) Agricultural - refers to a situation when the amount of moisture in the soil no longer meets the needs of a particular crop.
- (3) Hydrological - occurs when surface and subsurface water supplies are below normal.
- (4) Socioeconomic - refers to the situation that occurs when physical water shortage begins to affect people.

Historical California Droughts

A significant drought, reported by many of the ranchers in southern California, occurred in 1860. The great drought of the 1930s, coined the "Dust Bowl," was geographically centered in the Great Plains yet ultimately affected water shortages in California. The drought conditions in the plains resulted in a large influx of people to the west coast. Approximately 350,000 people from Arkansas and Oklahoma immigrated mainly to the Great Valley of California. As more people moved into California, including Los Angeles County increases in intensive agriculture led to overuse of the Santa Ana River watershed and groundwater resulting in regional water shortages. Several bills have been introduced into Congress in an effort to mitigate the effects of drought. In 1998, President Clinton signed into law the National Drought Policy Act, which called for the development of a national drought policy or framework that integrates actions and responsibilities among all levels of government. In addition it established the National Drought Policy Commission to provide advice and recommendations on the creation of an integrated federal policy. The most recent bill introduced into Congress was the National Drought Preparedness Act of 2003, which established a comprehensive national drought policy and statutorily authorized a lead federal utility for drought assistance. Currently there exists only an ad-hoc response approach to drought unlike other disasters (e.g., hurricanes, floods, and tornadoes) which are under the purview of FEMA.

Droughts exceeding three years are relatively rare in Northern California, the source of much of the State's developed water supply. The 1929-34 droughts established the criteria commonly used in designing storage capacity and yield of large Northern California reservoirs. The driest single year of California's measured hydrologic record was 1977. California's most recent multi-year droughts occurred between 1987-92 and 2006-2010.

The Long-term Climatic Viewpoint

The historical record of California hydrology is brief in comparison to geologically modern climatic conditions. The following sampling of changes in climatic conditions over time helps put California's twentieth century droughts into perspective. Most of the dates shown below are necessarily approximations.

Not only must the climatic conditions be inferred from indirect evidence, but the onset or extent of changed conditions may vary with geographic location. Readers interested in the subject of



paleo-climatology are encouraged to seek out the extensive body of popular and scientific literature on this subject.

Past California Droughts

The historical record of California hydrology is brief in comparison to the time period of geologically modern climatic conditions. The following samplings of changes in climatic and hydrologic conditions help put California's twentieth century droughts into perspective, by illustrating the variability of possible conditions. Most of the dates shown below are approximations, since the dates must be inferred from indirect sources.

11,000 years before present

Beginning of Holocene Epoch- Recent time, the time since the end of the last major glacial epoch.

6,000 years before present

Approximate time when trees were growing in areas now submerged by Lake Tahoe. Lake levels were lower then, suggesting a drier climate.

900-1300 A.D. (Approximate)

The Medieval Warm Period, a time of warmer global average temperatures. The Arctic ice pack receded, allowing Norse settlement of Greenland and Iceland. The Anasazi civilization in the Southwest flourished, its irrigation systems supported by monsoonal rains.

1300-1800 A.D. (approximate)

The Little Ice Age, a time of colder average temperatures. Norse colonies in Greenland failed near the start of the time period, as conditions became too cold to support agriculture and livestock grazing. The Anasazi culture began to decline about 1300 and had vanished by 1600, attributed in part to drought conditions that made agriculture infeasible.

Mid - 1500s A.D.

Severe, sustained drought throughout much of the continental U.S., according to dendrochronology. Drought suggested as a contributing factor in the failure of European colonies at Parris Island, South Carolina and Roanoke Island, North Carolina.

1850s A.D.

Sporadic measurements of California precipitation began.

1890s A.D.

Long-term stream flow measurements began at a few California locations. Of the many varied indexes used to measure drought, the "Palmer Drought Severity Index" (PDSI) is the most commonly used drought index in the United States. Developed by meteorologist Wayne Palmer, the PDSI is used to measure dryness based on recent temperature compared to the amount of precipitation. It utilizes a number range, 0 as normal, drought shown in terms of minus numbers, and wetness shown in positive numbers. The PDSI is most effective at analyzing long-range drought forecasts or predications. Thus, the PDSI is very effective at evaluation trends in the severity and frequency of prolonged periods of drought, and conversely wet weather. The National Oceanic and Atmospheric Administration (NOAA) publish weekly



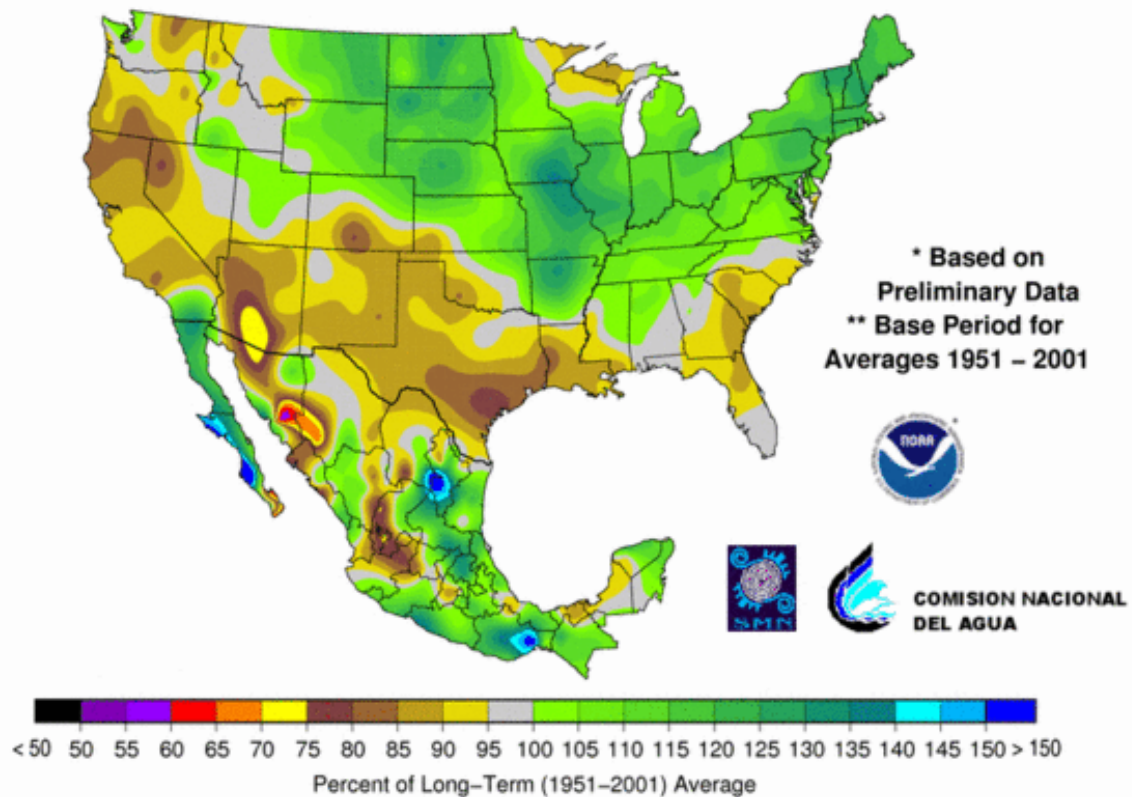
Palmer maps, which are also used by other scientists to analyze the long-term trends associated with global warming and how this has affected drought conditions.

The University of Nebraska-Lincoln has published many of these Palmer Drought Index maps analyzing trends over the past one hundred years (National Drought Mitigation Center 2005; Figure I). In coastal southern California, from 1895 to 1995, severe droughts occurred ten to 15 percent of the time. From 1990 to 1995, severe droughts occurred ten to 20 percent of the time and as recently as 1989, a severe drought was documented that lasted for six years. More recently, between 1999 and 2004, a six-year drought on the Colorado River basin has resulted in a drawdown of Colorado River water storage by more than 50 percent. Based on these trends, severe droughts can readily occur in southern California. According to the California Natural Resources Conservation Service (NRCS), the current drought in southern California has caused extensive devastation to forests in the mountains of San Bernardino, San Jacinto and Palomar Mountains. Drought weakens trees which make them susceptible to infestation by bark-beetles. In turn dry vegetation and beetle infested trees are more susceptible to fire than healthy forests.

Map: Percent of Long Term Average Precipitation is the most current snapshot of drought conditions across the U.S. It is provided by NOAA's Climate Prediction Center.

Map: Percent of Long Term Average Precipitation
(Source: NOAA Climate Prediction Center)

Percent of Long-Term Average Precipitation, 48-Month February 2008 – January 2012





PART III: MITIGATION STRATEGIES

Section 8: Mitigation Strategies

Overview of Mitigation Strategy

As the cost of damage from natural disasters continues to increase nationwide, the City of Whittier recognizes the importance of identifying effective ways to reduce vulnerability to disasters. Mitigation Plans assist communities in reducing risk from natural hazards by identifying resources, information and strategies for risk reduction, while helping to guide and coordinate mitigation activities throughout the City.

The plan provides a set of action items to reduce risk from natural hazards through education and outreach programs, and to foster the development of partnerships. Further, the plan provides for the implementation of preventative activities, including programs that restrict and control development in areas subject to damage from natural hazards.

The resources and information within the Mitigation Plan:

1. Establish a basis for coordination and collaboration among agencies and the public in the City of Whittier;
2. Identify and prioritize future mitigation projects; and
3. Assist in meeting the requirements of federal assistance programs

The Mitigation Plan is integrated with other City plans including the City's Emergency Operations Plan, the General Plan (including the Background Report, Housing Element, and associated Environmental Impact Report), the Capital Improvement Plan, and department-specific standard operating procedures.

Planning Approach

The four-step planning approach outlined in the FEMA publication, *Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies* (FEMA 386-3) was used to develop this plan:

- ✓ **Develop mitigation goals and objectives** - The risk assessment (hazard characteristics, inventory, and findings), along with municipal policy documents, were utilized to develop mitigation goals and objectives.
- ✓ **Identify and prioritize mitigation actions** - Based on the risk assessment, goals and objectives, existing literature/resources, and input from participating entities, mitigation activities were identified for each hazard. Activities were 1) qualitatively evaluated against the goals and objectives, and other criteria; 2) identified as high, medium, or low priority; and 3) presented in a series of hazard-specific tables.
- ✓ **Prepare implementation strategy** - Generally, high priority activities are recommended for implementation first.



However, based on community needs and goals, project costs, and available funding, some medium or low priority activities may be implemented before some high priority items.

- ✓ **Document mitigation planning process** - The mitigation planning process is documented throughout this plan.

Mitigation Measure Categories

Following is FEMA's list of mitigation categories. The activities identified by the Planning Team are consistent with the six broad categories of mitigation actions outlined in FEMA publication 386-3 *Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies*.

- ✓ **Prevention:** Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.
- ✓ **Property Protection:** Actions that involve modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- ✓ **Public Education and Awareness:** Actions to inform and educate citizens, property owners, and elected officials about hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.
- ✓ **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses preserve or restore the functions of natural systems. Examples include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- ✓ **Emergency Services:** Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.
- ✓ **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, retaining walls, and safe rooms.



Goals*

The Planning Team developed mitigation goals to avoid or reduce long-term vulnerabilities to hazards. These general principles clarify desired outcomes.

The goals are based on the risk assessment and Planning Team input, and represents a long-term vision for hazard reduction or enhanced mitigation capabilities. They are compatible with community needs and goals expressed in other planning documents prepared by the City.

Each goal is supported by mitigation action items. The Planning Team developed these action items through its knowledge of the local area, risk assessment, review of past efforts, identification of mitigation activities, and qualitative analysis.

	The five mitigation goals and descriptions are listed below.
FEMA defines Goals as general guidelines that explain what you want to achieve. They are usually broad policy-type statements, long-term, and represent global visions.	<i>Protect Life and Property</i> Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to losses from natural, human-caused, and technological hazards. Improve hazard assessment information to make recommendations for avoiding new development in high hazard areas and encouraging preventative measures for existing development in areas vulnerable to natural, human-caused, and technological hazards.
FEMA defines Mitigation Activities as specific actions that help you achieve your goals and objectives.	<i>Enhance Public Awareness</i> Develop and implement education and outreach programs to increase public awareness of the risks associated with natural, human-caused, and technological hazards.

Provide information on tools; partnership opportunities, and funding resources to assist in implementing mitigation activities.

Preserve Natural Systems

Support management and land use planning practices with hazard mitigation to protect life.

Preserve, rehabilitate, and enhance natural systems to serve hazard mitigation functions.

* ELEMENT C. MITIGATION STRATEGY | C3

C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))



Encourage Partnerships and Implementation

Strengthen communication and coordinate participation with public agencies, citizens, non-profit organizations, business, and industry to support implementation.

Encourage leadership within the City and public organizations to prioritize and implement local and regional hazard mitigation activities.

Strengthen Emergency Services

Establish policy to ensure mitigation projects for critical facilities, services, and infrastructure.

Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry.

Coordinate and integrate hazard mitigation activities where appropriate, with emergency operations plans and procedures.

The Planning Team also developed hazard-specific mitigation goals, which appear in Section 8: Mitigation Strategies.

Public Participation

Public input during development of the mitigation plan assisted in creating plan goals. Meetings with the Mitigation Planning Team and stakeholder interviews served as methods to obtain input and identify priorities in developing goals for reducing risk and preventing loss from natural hazards in the City of Whittier.

The planning process on this project began in 2015 with the following departments represented on the Planning Team:

- Community Development Department
 - Planning Division
- Parks & Recreation Department
- Police Department
- Los Angeles County Fire Department
- Administration
- Public Works Department
 - Engineering
 - Building & Safety
- Controller's Office/Risk & Emergency Management

How are the Mitigation Action Items Organized?

The action items are a listing of activities in which City agencies and citizens can be engaged to reduce risk. Each action item includes an estimate of the timeline for implementation.

The action items are organized within the following Mitigation Actions Matrix, which lists all of the multi-hazard (actions that reduce risks for more than one specific hazard) and hazard-specific action items included in the mitigation plan. Data collection and research and the public



participation process resulted in the development of these action items (Section 3: Planning Process). The Matrix includes the following information for each action item:

Funding Source

The action items can be funded through a variety of sources, possibly including: operating budget/general fund, development fees, Community Development Block Grant (CDBG), Hazard Mitigation Grant Program (HMGP), other Grants, private funding, Capital Improvement Plan, and other funding opportunities.

Coordinating Organization

The Mitigation Actions Matrix assigns primary responsibility for each of the action items. The hierarchies of the assignments vary – some are positions, others departments, and other committees. The primary responsibility for implementing the action items falls to the entity shown as the “Coordinating Organization”. The coordinating organization is the agency with regulatory responsibility to address hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring, and evaluation. Coordinating organizations may include local, county, or regional agencies that are capable of or responsible for implementing activities and programs.

Plan Goals Addressed

The plan goals addressed by each action item are included as a way to monitor and evaluate how well the mitigation plan is achieving its goals once implementation begins.

The plan goals are organized into the following five areas:

- ✓ Protect Life and Property
- ✓ Enhance Public Awareness
- ✓ Preserve Natural Systems
- ✓ Encourage Partnerships and Implementation
- ✓ Strengthen Emergency Services



*Ranking Priorities**

To assist with implementing the Hazard Mitigation Plan the Planning Team adopted the following process for ranking mitigation action items. Designations of “High”, “Medium”, and “Low” priority have been assigned to each action item using the following criteria:

Does the Action:

- ☐ solve the problem?
- ☐ address Vulnerability Assessment?
- ☐ reduce the exposure or vulnerability to the highest priority hazard?
- ☐ address multiple hazards?
- ☐ benefits equal or exceed costs?
- ☐ implement a goal, policy, or project identified in the General Plan or Capital Improvement Plan?

Can the Action:

- ☐ be implemented with existing funds?
- ☐ be implemented by existing state or federal grant programs?
- ☐ be completed within the 5-year life cycle of the LHMP?
- ☐ be implemented with currently available technologies?

Will the Action:

- ☐ be accepted by the community?
- ☐ be supported by community leaders?
- ☐ adversely impact segments of the population or neighborhoods?
- ☐ require a change in local ordinances or zoning laws?
- ☐ positive or neutral impact on the environment?
- ☐ comply with all local, state and federal environmental laws and regulations?

Is there:

- ☐ sufficient staffing to undertake the project?
- ☐ existing authority to undertake the project?

During the prioritization meeting of the Task Force, department representatives were provided worksheets for each of their assigned action items. Answers to the criteria above determined the priority according to the following scale.

- 1-6 = Low priority
- 7-12 = Medium priority
- 13-18 = High priority

*** ELEMENT C. MITIGATION STRATEGY | C5**

C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))



City of Whittier General Plan

The Planning Team went to great lengths to examine the various regulatory documents influencing the City's ability to mitigate against the identified hazards. Perhaps, the most important of those documents was the City's General Plan, last updated in 1993. It is the intention of the Planning Team to link the Mitigation Plan actions items as closely as possible to the City's General Plan. The purpose of this association is that many development projects require a determination of "General Plan conformity" prior to approval. If the Mitigation Plan and General Plan are aligned, this will better ensure both the sustainability and implementation of the Mitigation Plan. Since the establishment of the DMA 2000 regulations, FEMA and other regulators have been frustrated by the ineffectiveness of mitigation plan implementation – in other words, the failure of plans to actually affect the built environment and cause a reduction in risk. The Planning Team believes that changing the circle of build-damage-rebuild can most effectively be broken by linking the Mitigation Plan to the regulations and policy guidelines that allow for construction and land use.

The General Plan Policies are also included in the applicable Hazard-Specific Sections.

Following is a list of mitigation policies drawn from the General Plan.

Table: City of Whittier General Plan Goals & Policies

WHITTIER GENERAL PLAN GOALS & POLICIES (Note: Each of the policies includes a brief explanation as to applicability to the Hazard Mitigation Plan)	MITIGATION PLAN GOALS				
	Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
PUBLIC SAFETY ELEMENT					
<i>Issue: Seismic Risk and Other Hazards</i> Goal 2 Minimize loss of life, injuries, damage to property, and social and economic dislocation resulting from future regional or local seismic activity. Policy 2.1 Develop land use regulations that will mandate the review, evaluation, and restriction of development in areas where there are recognized hazards. Policy 2.2 Provide for the orderly abatement of structural hazards within the community, consistent with the degree of earthquake risk the community is willing to accept. Policy 2.3 Maintain contingency plans which will help	X	X	X	X	X



WHITTIER GENERAL PLAN GOALS & POLICIES (Note: Each of the policies includes a brief explanation as to applicability to the Hazard Mitigation Plan)	MITIGATION PLAN GOALS				
	Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
Whittier citizens respond to and recover from an earthquake as quickly and effectively as possible.					
Issue: Safety Services Goal 3 Maintain and enhance safety and emergency services in the City. Policy 3.1 Coordinate fire protection services with the County Fire Department. Policy 3.2 Maintain an adequate emergency response system. Policy 3.3 Assist the police and fire departments in monitoring the safety of all developments in the City. Policy 3.4 Continue to maintain fire safety through building inspections, weed abatement, and other programs. Policy 3.5 Provide adequate fire and police services for new developments in the planning area. Policy 3.6 Periodically review the City's emergency equipment and shelters to ensure that they are adequate to meet the needs of changing land uses and development types.	X	X	X	X	X



Mitigation Actions Matrix^{*†‡§**}

Following is Table: Mitigation Actions Matrix which identifies the existing and future mitigation activities developed by the Planning Team.

* ELEMENT C. MITIGATION STRATEGY C1
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))
† ELEMENT C. MITIGATION STRATEGY C4
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))
‡ ELEMENT C. MITIGATION STRATEGY C5
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))
§ ELEMENT D. MITIGATION STRATEGY D2
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))
** ELEMENT D. MITIGATION STRATEGY D3
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))



Table: Mitigation Actions Matrix

Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
Multi-Hazard Mitigation Action Items												
MH 1	Reference the Natural Hazard Mitigation Plan in the next General Plan Safety Element update.	Community Development Department (CD)	5 years	X	X	X	X	X	High	u/k	Deferred – no General Plan update since the 2010 Mitigation Plan.	HMP
MH 2	Identify and pursue funding opportunities to develop and implement local mitigation activities.	Emergency Services Coordinator (ESC)	Ongoing	X	X	X	X	X	High	CB		CB
MH 3	Establish a formal role for the Hazard Mitigation Planning Team to develop a sustainable process for implementing, monitoring, and evaluating citywide mitigation activities.	Hazard Mitigation Planning Team (PT)	Completed		X		X		Low	CB	Revised – action item	HMP



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	Hold bi-yearly meetings using EMS Community Disaster Preparedness Planning.											
MH 4	Maintain inventory of critical facilities (those facilities that provide life-saving services or support during the emergency response phase).	CD, Public Works (PW)	Ongoing	X			X	X	High	CB	Revised – initial inventory was completed during the 2012 update to the EOP. Inventory will be kept up-to-date using the EOP update process.	CB
MH 5	Develop, enhance, and implement education programs aimed at mitigating natural hazards, and reducing the risk to citizens, public agencies and private property	PT	Ongoing		X				High	CB		HMP



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	owners.											
MH 6	Work with Los Angeles County Fire Department and Puente Hills Landfill Native Habitat Authority to coordinate mitigation activities for fire prevention utilizing the Fuel Modification Plan for implementation.	PT	Ongoing	X	X	X	X		High	CB		HMP
MH 7	Utilize the media to educate the public about hazards prevalent to their area. Especially interested in sharing availability of "My Hazards.com through Cal OES.	PT	1 year		X				High	CB	Revised – action item, timeline	HMP
MH 8	Publicize the documents associated with	PT	Ongoing		X				High	CB	Revised – action item	HMP



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	emergency response and mitigation. Continue to post the Natural Hazards Mitigation Plan on the City's website.											
MH 9	Post the Executive Summary of the Natural Hazards Mitigation Plan on the City's website.	ESC	Ongoing		X				Low	GF	Deleted – merged with another existing action item	
MH 10	Utilize the media for the distribution and publication of hazard information.	PT	Ongoing		X				Low	GF	Deleted - redundant	
MH 11	Utilize the website to publicize FEMA's Emergency Management Institute's Independent Study Courses available to the public – particularly Disaster	ESC	1 year		X				Med	n/k	Revised – action item	HMP



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	Mitigation for Homeowners. Also, LA County Fire's "Ready, Set, Go".											
MH 12	Encourage and facilitate the adoption of California building codes and Los Angeles County Fire Code that provide protection for new construction and substantial renovations from the effects of identified hazards.	CD	Ongoing	X		X	X	X	High	CB	Revised – action item	CB, HMP
MH 13	Review existing regulations to reduce the effect of natural hazards on future development (e.g. Zoning Code, General Plan).	CD	Ongoing	X					High	CB		HMP
MH 14	Assess availability	PT	Completed					X			Completed in	



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	of backup power resources (generators) of police, City Emergency Operations Center; upgrade resources as necessary.										2010	
MH 15	Allocate City resources and assistance to mitigation projects when possible.	PT	Ongoing					X	Med	u/k	Deleted - redundant	
MH 16	Promote hazard mitigation as a public value in recognition of its importance to the health, safety, and welfare of the population. (Example: Ready, Set, Go)	PT	Ongoing		X				Med	CB	Revised – action items	CB, HMP
MH 17	Coordinate and integrate natural hazard mitigation	PT	Ongoing					X	Med	CB		CB, HMP



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	activities, where appropriate, with emergency operations plans and procedures.											
MH 18	Utilize existing public safety announcements on mitigation steps and strategies (e.g. residential earthquake retrofitting).	City Manager's Office (CM)	Ongoing	X	X				Low	CB	Completed – initial database established in 2011	CB, HMP
MH 19	Maintain land management database in future hazard GIS system for properties in the City. This database would include information about location of areas threatened by earthquake faults, landslides, liquefaction, and	ESC	Ongoing	X	X				Low	CB		CB, HMP



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	wildfires)											
MH 20	Prioritize mitigation projects identified in the Capital Improvement Plan.	PW	Annual	X		X	X	X	High	CB		CIP
MH 21	Budget for and identifying staffing resources a year in advance of the 5-year Mitigation Plan update.	PT	Ongoing	X	X	X	X	X	High	u/k		CB
MH 22	Review, add, and enforce conditions of approval for all new construction and subdivision maps to minimize impacts/threats from fire, floods, and earthquakes.	CD, LACFD, PW	Ongoing	X					High	n/a	New	GP
MH 23	Seek funding to update the General Plan Safety Element in conjunction with 5-year update to the	CD	Now	X	X	X	X	X	High	CB, GF	New	CB, GF



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	next Mitigation Plan. As per California Senate Bill 379, Mitigation Plan updates after 2017 will be required to also include updates to the City's General Plan Safety Element.											
Earthquake Mitigation Action Items												
EQ 1	Incorporate earthquake transportation evacuation routes into the Safety Element of the General Plan. Note: evacuation plan also used in wildfire evacuation depending on route availability	LACFD	1 year					X	High	u/k	Revised – action item, coordination organization, timeline	GP
EQ 2	Review seismic strength of	CD	Ongoing	X	X				High	CB		CB



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	remodeled structures in the City as deemed appropriate by the building official.											
EQ 3	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and local government offices.	ESC	Ongoing	X	X				High	CB	Revised – assignment	CB
EQ 4	Adoption of California Building Code by municipality.	ESC	Completed	X							Completed – adopted in 2013	
EQ 5	Ensure post-disaster rebuilding is in conformance with applicable codes, specifications, and standards.	CD	Ongoing	X					High	CB	Revised – action item	CB



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
EQ 6	Ensure repairs or construction funded by Federal disaster assistance conform to applicable codes and standards.	CD	Ongoing	X					High	CB		
EQ 7	Encourage construction and subdivision design that can be applied to steep slopes to reduce the potential adverse impacts from ground failure, mudslides, etc.	CD	Ongoing	X					High	CB		
EQ 8	Encourage private property owners to conduct seismic strength evaluations of facilities classified as critical or essential to City emergency response activities.	CD, PW	Ongoing	X					High	GF	Revised –action item	HMP
Flood Mitigation Action Items												



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
FLD 1	Recommend revisions to proposed plans for development within floodplain, where appropriate.	CD	Ongoing	X					High	CB	Revised – action item	CB
FLD 2	Development on or adversely affecting floodplains shall be discouraged, if feasible alternatives exist, as determined by the City.	CD	Ongoing	X					High	CB	Revised – action item	CB
FLD 3	Analyze, identify and construct storm drainage facilities to mitigate flooding for the properties (Example: Flomar).	PW	Completed (2007)	X		X		X			Revised – action item	
FLD 4	Prepare a Master Plan of Storm Drainage to assess surface water flow which will consider historic and future	PW – Engineering Division	5 years	X					High	GF	Seeking funding	GF



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWM= (Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	drainage problems and published floodplain maps.											
FLD 5	Continue to promote and adhere to the standards associated with the National Flood Insurance Program.	CD, PW	Ongoing	X	X	X	X	X	High	CB		CB
Wildfire Mitigation Action Items												
WF 1	Develop plan to increase the efficiency of wildfire evacuation.	Police Department (PD), LACFD	1 year	X				X	Med	CB	Revised – action item, coordinating organization	CB
WF 2	Inventory flow at hydrants and prioritize facility improvements to increase water pressure (1,000 flow tests on fire hydrants completed in 2006).	PW – Water Division	Ongoing (Annual)	X				X	High	CB, GF		CB, GF
WF 3	Encourage	CD, LACFD	Ongoing	X	X	X	X	X	High	CB	Revised – action	CB



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				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	dissemination of maps relating to the fire hazard to help educate and assist builders and homeowners. (Example: inform property owners in the Very High Fire Hazard Zone of defensible space and other mitigation protocols)										item	
WF 4	Continue to promote communication, coordination and collaboration between wildland/urban interface property owners, local planners and the Los Angeles County Fire Department to	ESC, LACFD	Ongoing	X	X	X	X	X	Med	CB		CB



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				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	address risks and mitigation measures.											
WF 5	Support and sustain the distribution of information about fire to property owners in areas identified to be at risk through hazard mapping to avoid activity that increases risk to natural hazards.	CD, LACFD	Completed	X	X	X	X	X	High		Deleted - redundant	
WF 6	Develop an Urban Water Management Plan (UWMP).	LACFD, PW	Completed	X	X	X	X	X	High		Completed 2008, Updated 2015	
WF 7	Implement Master Water Plan	LACFD, PW	Ongoing	X	X	X	X	X	High	CB, GF	Revised - timeline	CB, GF
WF 8	Building Official instructs course offered in both northern and southern California on Fire Resistant	CD - Building and Safety Division	Ongoing	X	X	X	X	X	High		Deleted - no longer accurate	



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	Rated Construction and on-Wildland Urban Interface Building Standards (CBC Chapter 7 and 7A) to building and fire officials, plan checkers, inspectors, architects and other design professional statewide.											
WF 9	Development outreach program to push information to owners/tenants located in the Very High Fire Hazard Zone. Utilize City website and other resources.	LACFD	1 year	X	X	X	X	X	High	CB, GF	New	CB, GF
Drought Mitigation Action Items												
DR 1	Develop and enforce the City's Water Conservation	CD, PW	Ongoing	X	X	X	X	X	High	GR, CB	New	UWMP



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	Ordinance (May 2015)											
DR 2	Assess Vulnerability to Drought Risks: <ul style="list-style-type: none"> ▪ Gathering and analyzing water and climate data to gain a better understanding of local climate and drought history. ▪ Identifying factors that affect the severity of a drought. ▪ Identifying available water supplies. ▪ Determining how the community and its water sources have been impacted by droughts in the past. 	PW	Ongoing	X	X	X	X	X	High	GR, CB	New	UWMP



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
DR 3	Monitor Drought Conditions: ▪ Identify local drought indicators, such as precipitation, temperature, surface water levels, soil moisture, etc. ▪ Establish a regular schedule to monitor and report conditions on at least a monthly basis.	PW	Ongoing	X	X	X	X	X	High	GR, CB	New	UWMP
DR 4	Monitor Water Supply: ▪ Regularly checking for leaks to minimize water supply losses. ▪ Improving water supply monitoring.	PW	Ongoing	X	X	X	X	X	High	GR, CB	New	UWMP
DR 5	Plan for Drought: ▪ Developing a	PW	Ongoing	X	X	X	X	X	High	GR, CB	New	UWMP



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed						Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services	Rank - Low, Med, High			
	drought emergency plan. ▪ Developing criteria or triggers for drought-related actions. ▪ Developing a drought communication plan and early warning system to facilitate timely communication of relevant information to officials, decision makers, emergency managers, and the general public. ▪ Developing agreements for secondary water sources that may be used during drought conditions. ▪ Establishing an irrigation											



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	time/scheduling program or process so that all agricultural land gets the required amount of water. Through incremental timing, each area is irrigated at different times so that all water is not consumed at the same time. Spacing usage may also help with recharge of groundwater.											
DR 6	Encourage Water Conservation During Drought Conditions: ▪ Consider adopting ordinances to prioritize or control water use, particularly for	PW	Ongoing	X	X	X	X	X	High	GR, CB	New	UWMP



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	emergency situations like fire-fighting.											
DR 7	Consider Retrofit of Water Supply Systems: ▪ Designing water delivery systems to accommodate drought events. ▪ Developing new or upgrading existing water delivery systems to eliminate breaks and leaks.	PW	Ongoing	X	X	X	X	X	High	GR, CB	New	UWMP
DR 8	Enhance Landscaping and Design Measures: ▪ Incorporating drought tolerant or xeriscape practices into landscape ordinances to reduce dependence on	CD, PW	Ongoing	X	X	X	X	X	High	GR, CB	New	UWMP



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	irrigation. ▪ Encourage use of permeable driveways and surfaces to reduce runoff and promote groundwater recharge.											
DR 9	Educate Residents on Water Saving Techniques: ▪ Installing low-flow water saving showerheads and toilets. ▪ Turning water flow off while brushing teeth or during other cleaning activities. ▪ Adjusting sprinklers to water the lawn and not the sidewalk or street. ▪ Running the	CD, PW	Ongoing	X	X	X	X	X	High	GR, CB	New	UWMP



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	dishwasher and washing machine only when they are full. ▪ Checking for leaks in plumping or dripping faucets. ▪ Installing rain-capturing devices for irrigation. ▪ Encouraging the installation of graywater systems in homes to encourage water reuse.											
DR 10	Water Delivery Systems: When possible, encourage designs or plans for water delivery systems that include consideration for drought events.	PW	Ongoing	X	X	X	X	X	High	GR, CB	New	UWMP
DR 11	Water Saving:	CD	Ongoing	X	X	X	X	X	High	GR, CB	New	CB



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	citizens can be encouraged to take water-saving measures, especially when extra water is needed for irrigation and farming. Possibilities include installing low-flow water saving showerheads and toilets, and turning water flow off while brushing teeth or during other cleaning activities.											
DR 12	Encourage drought tolerant landscaping for new development in the City.	CD, PW	Ongoing	X	X	X	X	X	High	CB	New	UWMP
DR 13	Enforcement of California's Green Building Code that	CD, PW	Ongoing	X	X	X	X	X	High	CB	New	UWMP



Action Item Code	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed					Rank - Low, Med, High	Funding Source (u/k = unknown, CB = City Budget, GF = Grant Funded)	2015 Comments (Status - Completed, Revised, Deleted, New, and Deferred)	Planning/Policy Mechanism (HMP=Hazard Mitigation Plan, GP=General Plan, CIP=Capital Improvement Plan, CB=City Budget, GF=Grant Funded), UWMP=(Urban water Management Plan)
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services				
	requires low-flow water conservation fixtures.											



Section 9: Planning Process

Plan Methodology*

DMA 2000 emphasizes the importance of participatory planning in the development of Mitigation Plans. This Mitigation Plan was written using the best available information from a wide variety of sources.

Throughout the planning process, the City made a concerted effort to gather information from city and county departments, as well as state and federal agencies, the local business community, Whittier residents, and other stakeholders.

Disaster Mitigation Act of 2000

Requirement §201.6(c) (1)

[The plan shall include...]

the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

The Planning Team solicited information from internal and external departments and agencies with specific knowledge of natural hazards and past historical events, as well as planning and zoning codes, ordinances, and recent planning decisions. The hazard mitigation strategies contained in this plan were developed through an extensive planning process involving local businesses and residents.

On November 10, 2015, staff presented the Mitigation Plan to the City Council for consideration. A copy of the City Council Resolution adopting the Mitigation Plan appears in Section 10: Planning Process.

The rest of this section describes the mitigation planning process including 1) Planning Team involvement, 2) extended Planning Team support, 3) public and other stakeholder involvement; and 4)

integration of existing data and plans.

Planning Team

The Planning Team met in April, May, and June of 2015 to review the updated requirements associated with DMA 2000, develop a work plan for creating Plan update, provide status reports on the 2010 Mitigation Actions Matrix, and develop new mitigation action items.

Who Participated in Developing the Plan?

The Mitigation Plan is the result of a collaborative planning effort between City of Whittier citizens, public agencies, non-profit organizations, the private sector, regional, and state and federal organizations. Public participation played a key role in development of goals and action items. A Planning Team guided the process of developing the plan and consisted of the following representatives:

* ELEMENT A: PLANNING PROCESS | A1

A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))



Table: Planning Team Timeline

	Feb 2015	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 2016	Feb
Request for Proposal Issued	X												
Contracted with Emergency Planning Consultants		X											
Research and Writing of 2015 Plan Update			X	X	X	X	X						
Planning Team Meeting #1			X										
Planning Team Meeting #2				X									
Planning Team Meeting #3					X								
Planning Team Review and Comment on First Draft Plan							X						
Distribute Second Draft for input by Public & External Agencies								X					
Publicize Availability of Third Draft Plan									X				
Public Notice of City Council Public Meeting									X				
Present 2015 Plan Update to City Council at Public Meeting										X			
Receive FEMA Approval													

Planning Team

The Planning Team consisted of:

- Don Dooley, Community Development Department – Chair of Planning Team
- Greg Alaniz, Parks & Recreation Department
- Dave Edgell, Public Works Department – Streets
- Carl Hassel, Administration
- Sonya Lui, Community Development Department
- Jared Macias, Public Works Department - Water
- Chris Magdosku, Public Works Department - Engineering
- Yolanda Martinez, Controller's Office/Risk & Emergency Management
- Brett Petroff, Controller's Office/Risk & Emergency Management
- Jay Tatman, Police Department
- Devin Trone, Los Angeles County Fire Department
- Carlos Yado, Community Development Department – Building & Safety



Planning Team Involvement

The Planning Team was responsible for the following tasks:

- ✓ Establish plan development goals
- ✓ Prepare timetable for plan completion
- ✓ Ensure plan meets DMA 2000 requirements, and federal and state guidelines
- ✓ Organize and oversee public involvement
- ✓ Solicit participation of government agencies, businesses, residents, and other stakeholders
- ✓ Gather information (such as existing data and reports)
- ✓ Develop, revise, adopt, and maintain plan

The Planning Team, with support from other City staff and local organizations, identified and profiled hazards; determined hazard rankings; estimated potential exposure or losses; evaluated development trends and specific risks; and developed mitigation goals, objectives, and activities.

Planning Team Meetings

The Team met for three meetings to review the updated requirements of DMA 2000, review the status of mitigation actions identified in the 2010 Natural Hazards Mitigation Plan, develop additional mitigation action items, and develop an updated implementation plan. In addition to the meetings, the entire Planning Team participated in contributing content, editing, and finalizing the Mitigation Plan prior to submission to the City Council.

Table: Planning Team Level of Participation*

	Issue Request for Proposal	Contract with Emergency Planning Consultants	Research and Writing of 2015 Plan Update	Planning Team Meeting #1 (4.13.15)	Planning Team Meeting #2 (5.12.15)	Planning Team Meeting #3 (6.9.15)	Review and Comment on Draft Plan	Attend City Council Public Meeting	Receive FEMA Approval
City and County Staff									
Don Dooley, Planning Services Manager, Community Development Department – Chair of Planning Team	X	X	X	X	X	X	X		
Greg Alaniz, Parks & Recreation Department			X	X	X		X		

* ELEMENT A: PLANNING PROCESS | A1

A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))



	Issue Request for Proposal	Contract with Emergency Planning Consultants	Research and Writing of 2015 Plan Update	Planning Team Meeting #1 (4.13.15)	Planning Team Meeting #2 (5.12.15)	Planning Team Meeting #3 (6.9.15)	Review and Comment on Draft Plan	Attend City Council Public Meeting	Receive FEMA Approval
Dave Edgell, Public Works Department – Streets			X	X	X		X		
Carl Hassel, Administration			X		X	X	X		
Sonya Lui, Community Development Department			X	X	X	X	X		
Jared Malias, Public Works Department - Water			X	X	X		X		
Chris Magdosku, Public Works Department - Engineering			X	X	X	X	X		
Yolanda Martinez, Controller's Office/Risk & Emergency Management			X		X	X	X		
Brett Petroff, Controller's Office/Risk & Emergency Management			X		X		X		
Jay Tatman, Police Department			X	X	X		X		
Devin Trone, Los Angeles County Fire Department			X	X	X	X	X		
Carlos Yado, Community Development Department – Building & Safety			X	X	X	X	X		
Consulting Staff									
Carolyn Harshman, Emergency Planning Consultants		X	X	X	X	X			

Following is a listing of the meetings attended by City of Whittier staff concerning development of the Natural Hazards Mitigation Plan:

Date: April 13, 2015

Location: City of Whittier – City Council Chambers

Facilitated by: Emergency Planning Consultants

Topic: Kick-Off Meeting and Planning Process

Carolyn Harshman delivered an overview of the hazard mitigation planning process for the benefit of Planning Team members not involved in the preparation of the 2010 Hazard Mitigation Plan. The meeting also involved an overview of the Initial Risk Assessment and ranking of hazards.



Date: May 12, 2015

Location: City of Whittier – City Council Chambers

Facilitated by: Emergency Planning Consultants

Topic: Existing and Future Mitigation Action Items

Carolyn Harshman facilitated a workshop reviewing the status of the 2010 Mitigation Action Items as well as development new action items. There was an extensive discussion on various methods of engaging the public in the mitigation process.

Date: June 9, 2015

Location: City of Whittier – City Council Chambers

Facilitated by: Emergency Planning Consultants

Topic: Existing and Future Mitigation Action Items

Carolyn Harshman facilitated a workshop continuing development of new action items. The Planning Team discussed plan implementation and agreed that the Planning Team should meet on a quarterly basis to ensure plan implementation (see Section 4: Plan Maintenance). Team members will provide project direction and oversight and assist with plan evaluation. In addition to providing status on the 2010 mitigation action items, the team reviewed lists of action item ideas from two documents: 1) County of Los Angeles All-Hazard Mitigation Plan – Appendix B: Jurisdictional Guide to Updating Hazard Mitigation Plans, and 2) FEMA's Mitigation Ideas – a Resource for Reducing Risk to Natural Hazards.





Planning Team Involvement*

The Planning Team was responsible for the following tasks:

- ✓ Establish plan development goals
- ✓ Prepare timetable for plan completion
- ✓ Ensure plan meets DMA 2000 requirements, and federal and state guidelines
- ✓ Organize and oversee public involvement
- ✓ Solicit participation of government agencies, businesses, residents, and other stakeholders
- ✓ Gather information (such as existing data and reports)
- ✓ Develop, revise, adopt, and maintain plan
- ✓ Participate in Committee meetings and City County public meeting

The Planning Team, with support from other City staff and local organizations, identified and profiled hazards; determined hazard rankings; estimated potential exposure or losses; evaluated development trends and specific risks; and developed mitigation goals, objectives, and activities.

During its meetings the Planning Team gathered and shared information, assessed risks, identified critical facilities, developed mitigation strategies, and provided continuity throughout plan development to ensure the plan addresses jurisdiction-specific hazard vulnerabilities and mitigation strategies. Members communicated regularly by phone and email between group meetings.

The Planning Team will meet annually after the plan is adopted. Members will provide project direction and oversight, assist with plan evaluation, and convene supplementary meetings as needed.

Outside Agency Involvement

A variety of agencies and individuals provided data and expertise during plan writing process. This effort was supplemented by inviting external agencies with an interest in Whittier's development to participate in reviewing and contributing to the mitigation plan. Minor typographical suggestions were incorporated into the document as a result of distribution to outside agencies. The invitation and invitee list of external reviewers is attached to this Section.

* ELEMENT A: PLANNING PROCESS | A2

A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))



State and Federal Guidelines and Requirements for Mitigation Plans

Following are the Federal requirements for approval of a mitigation plan:

- ✓ Open public involvement, with public meetings that introduce the process and project requirements.
- ✓ The public must be afforded opportunities for involvement in identifying and assessing risk, drafting a plan, and public involvement in approval stages of the plan.
- ✓ Community cooperation with an opportunity for other local government agencies, the business community, educational institutions, and non-profits to participate in the process.
- ✓ Incorporation of local documentation including the local General Plan, the Zoning Ordinance, the Building Codes, and other pertinent documents.

To facilitate communication between the Planning Team and Whittier residents, and to involve the public in ongoing planning and evaluation, this plan will be available to the public through a variety of venues.

The following components must be part of the planning process:

- ✓ Complete documentation of the planning process
- ✓ A detailed risk assessment on hazard exposures in the City
- ✓ A comprehensive mitigation strategy, which describes the goals and objectives, including proposed strategies, programs and actions to avoid long-term vulnerabilities
- ✓ A plan maintenance process, which describes the method and schedule of monitoring, evaluating and updating the plan and integration of the Mitigation Plan into other planning mechanisms
- ✓ Formal adoption by the City Council
- ✓ Plan review by Cal OES
- ✓ Plan approval by FEMA

These requirements are identified in greater detail in the following plan sections and supporting documentation.

Public participation opportunities were created through distribution of the plan to the public and external agencies during the plan writing phase. In addition, the makeup of a Planning Team ensured a constant exchange of data and input from internal and external organizations. Through its consultant, Emergency Planning Consultants, the City had access to numerous existing mitigation plans from around the country, as well as current FEMA Mitigation Planning standards (386 series) and the State of California Mitigation Plan Guidance.

Other reference materials consisted of state, county, and city mitigation plans, including:

- ✓ County of Los Angeles All-Hazard Mitigation Plan (2014)
- ✓ State of California Natural Hazards Mitigation Plan (2010)



Hazard specific research: City staff collected data and compiled research on four hazards: earthquakes, floods, wildfires, and drought.

Research materials came from the City's General Plan, the City's Hazard Analysis contained in the Emergency Operations Plan, and state agencies including Cal OES and CAL FIRE. The City of Whittier staff conducted research by locating City of Whittier information in historical documents. Information was also incorporated from after-action documentation provided for previous proclaimed and declared disasters. The City of Whittier staff identified current mitigation activities, resources, and programs, and potential action items from research materials and stakeholder interviews.

Public Participation

To facilitate communication between the Planning Team and Whittier residents, and to involve the public in ongoing planning and evaluation, this plan will be available to the public through a variety of venues. Community involvement increases the likelihood that hazard mitigation will become a standard consideration in the City's evolution.

Hazard Mitigation Programs

The City of Whittier adheres to the Stafford Act, the California Emergency Services Act, and DMA 2000, which require local governments to develop and implement Mitigation Plans. Cities and counties have intimate knowledge of local geography, and they are on the front line with personnel and equipment during a disaster. Local governments are in the best position to assess their strengths, weaknesses, opportunities, and constraints.

Coordination with Federal Policies

The City is involved in the NFIP, which helps the City receive funding for flood insurance and flood mitigation projects. Data from the NFIP was used in the risk assessment, resulting in a number of mitigation activities. The City's continued involvement in NFIP supports this plan.

National Flood Insurance Program

Established in 1968, the NFIP provides federally-backed flood insurance to homeowners, renters, and businesses in communities that adopt and enforce floodplain management ordinances to reduce future flood damage. The City of Whittier adopted a floodplain management ordinance and has Flood Insurance Rate Maps (FIRM) that show floodways, 100-year flood zones, and 500-year flood zones. The Public Works Director is designated as floodplain administrator.

Current Mitigation Programs

The City intends to incorporate mitigation planning as an integral component of daily operations; the Planning Team will work to integrate mitigation strategies into the general operations of the City and partner organizations. After conducting a capability assessment (Section 3: Risk Assessment), the Planning Team will identify additional policies, programs, practices, and procedures that could be modified to address mitigation activities. In addition, the City intends



to implement the plan through its involvement in FEMA and Cal OES programs. Table: Existing Processes and Programs identifies existing processes/programs through which the plan could be implemented.

Table: Existing Processes and Programs*

Process	Action	Implementation of Plan
Administrative	Departmental or organizational work plans, policies, and procedural changes	<ul style="list-style-type: none"> ✓ City Manager's Office ✓ Planning Services Division ✓ Public Works Department ✓ Other departments as appropriate
Administrative	Other plans	<ul style="list-style-type: none"> ✓ Reference plan in Emergency Operations Plan ✓ Address plan findings and incorporate mitigation activities in General Plan
Budgetary	Capital and operational budgets	<ul style="list-style-type: none"> ✓ Include line item mitigation measures in budget as appropriate
Regulatory	Executive orders, ordinances, and other directives	<ul style="list-style-type: none"> ✓ Building Code ✓ Capital Improvement Plan (Require hazard mitigation in design of new construction) ✓ Comprehensive Planning (Institutionalize hazard mitigation in land use and new construction) ✓ National Flood Insurance Program ✓ Water Quality Management Plan ✓ Urban Water Management Plan ✓ Zoning Ordinance
Funding	Traditional and nontraditional sources	<ul style="list-style-type: none"> ✓ Once plan is approved, seek authority to use bonds, fees, loans, and taxes to finance projects ✓ Seek assistance from federal and state government, foundation, nonprofit, and private sources, such as Hazard Mitigation Grant Program ✓ Research grant opportunities through U.S. Department of Housing and Urban Development, Community Development Block Grant
Partnerships	Creative funding and initiatives	<ul style="list-style-type: none"> ✓ Community volunteers ✓ In-kind resources ✓ Public-private partnerships ✓ State support
Partnerships	Advisory bodies and committees	<ul style="list-style-type: none"> ✓ Emergency Management Ad Hoc Committee ✓ Inter-Agency Coordination Group ✓ Safety Committee

<p>* ELEMENT C. MITIGATION STRATEGY C1</p> <p>C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))</p>
--



In addition to being required by DMA 2000, adoption of the plan is necessary because:

- ✓ It lends authority to the plan to serve as a guiding document for all local and state government officials;
- ✓ It gives legal status to the plan in the event it is challenged in court;
- ✓ It certifies to program and grant administrators that the plan's recommendations have been properly considered and approved by the governing authority and jurisdictions' citizens; and
- ✓ It helps to ensure the continuity of mitigation programs and policies over time because elected officials, staff, and other community decision-makers can refer to the official document when making decisions about the community's future.

Source: FEMA. 2003. "How to Series" - *Bringing the Plan to Life* (FEMA 386-4)

Use of Existing Data*

The Planning Team gathered and reviewed existing data and plans during plan development. Numerous electronic and hard copy documents were used to support the planning process:

- ✓ City of Whittier
- ✓ County of Los Angeles General Plan, (2005)
- ✓ County of Los Angeles All-Hazards Mitigation Plan, (2014)
- ✓ FEMA's Mitigation Ideas – a Resource for Reducing Risk to Natural Hazards
- ✓ HAZUS reports (County of Los Angeles)
- ✓ Historic GIS maps and local inventory data
- ✓ Local Flood Insurance Rate Maps

These documents were used as resources throughout the Plan (See "Sources" for maps, tables, etc. throughout the Plan)

Federal Data

A variety of federal data was collected and used throughout the mitigation planning process:

- ✓ Census data
- ✓ FEMA "How To" Mitigation Series (386-1 to 386-9)
- ✓ National Oceanic and Atmospheric Administration statistics

The Planning Team also examined public laws and programs (such as the National Flood Insurance Program) during plan development.

A list of existing data and plans used to support the mitigation planning effort appears in Appendix: Resource Directory. The length of this list demonstrates the importance of mitigation planning in existing programs. Implementing the plan through existing programs is identified as a mitigation action in Section 9: Mitigation Strategies. A description of the implementation process and potential funding sources is provided.

* ELEMENT A: PLANNING PROCESS | A4

A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))



Invitation Process

The Planning Team identified possible public notice sources. The Agenda Item concerning the Plan's presentation to participate in the plan writing process was posted on the City website. In addition, the opportunity was posted at City Hall and the Library. Invitations to representative of external agencies were distributed via email.

The same noticing protocols were followed for the City Council public meeting.

City Council Public Meeting

City of Whittier conducted one public meeting concerning the update of the Mitigation Plan. The City Council heard the item on November 10, 2015.

Plan Adoption Process

Adoption of the plan by the local governing body demonstrates the City's commitment to meeting mitigation goals and objectives. Governing body approval legitimizes the plan and authorizes responsible agencies to execute their responsibilities.

The City Council must adopt the Mitigation Plan before the Plan can be approved by FEMA. The resolution of adoption by the City Council is in Section 9: Planning Process.

The Planning Team prepared a staff report on the Plan, including an overview of the Hazard Analysis, Mitigation Goals, and Mitigation Actions. The staff report concluded with a summary of the input received during the plan writing phase and the public noticing phase. The meeting participants were encouraged to present their views and make suggestions on possible mitigation actions.

The Council was supportive of the overall goal established by the Planning Team to become a more disaster resilient community. The City Council commended the Planning Team representatives for its dedication and efforts to satisfy the DMA 2000 requirements. The City Council voted unanimously for the adoption of the Mitigation Plan.

Plan Approval

The City-Council adopted Plan was submitted to Cal OES for review. Minor revisions were made and the Plan was forwarded to FEMA for review. FEMA approved the Plan on _____ (see Section 9: Planning Process - Attachments).



Attachment: FEMA Letter of Approval



Attachment: External Agency Reviewers

External reviewers listed below were provided with an electronic link to the Second Draft Plan and asked to provide input directly to Don Dooley, Planning Services Manager. Following is a sample of the email distributed along with the invitation to comments. Minor typographical suggestions were gathered and incorporated into the Third Draft Plan prior to submission to City Council. Also below, the list of invited External Agencies.

External Agency Reviewers		
Agency	Name	Job Title
Whittier College	Sharon Herzberger	President
Rio Hondo College	Jim Poper	Director of Facilities
County of Los Angeles Planning	Mark Herwick	Regional Planning Supervisor
City of La Habra	Jim Sadro	City Manager
City of La Habra Heights	Shauna Clark	City Manager
City of La Mirada	Jeff Boynton	City Manager
City of Pico Rivera	René Bobadilla	City Manager
City of Santa Fe Springs	Thaddeus McCormack	City Manager
Los Angeles Sanitation District	Grace Robinson Hyde	Chief Engineer and General Manager
Los Angeles County Public Works Department	Gail Farber	Director of Public Works
Presbyterian Intercommunity Hospital	Dave Klinger	VP Facilities & Real Estate
California Domestic Water Company	Jim Byerrum	President
Suburban Water Systems	Tom Medina	Construction Manager
Charter Communications	Tom Adams	Executive Vice President, Field Operations
Verizon FIOS	Jeff McLuckey	Sales Operation Supervisor
Southern California Edison	Javier Rameriz	Construction Maintenance Manager
Southern California Gas Company	Julia Emerson	Public Affairs Manager
Whittier City School District	Jon McNeil	Assistant Superintendent
East Whittier City School District	Drew Passalacqua, Ed.D.	Director, Administrative Services
South Whittier School District	Mark Kerikous	Assistant Superintendent of Business Services
Los Nietos School District	Jonathan Vasquez	Superintendent
Whittier Union High School District	David Pasillas	Manager of Maintenance, Operations & Energy Education
Fullerton Union High School District	Javier Sierra	Director of Maintenance and Operations



Attachment: Email Invitation to External Agency Reviewers

From: ddooley@cityofwhittier.org [mailto:ddooley@cityofwhittier.org]

Sent: Wednesday, September 23, 2015 1:14 PM

To: Herzberger

Sharon; JPoper@riohondo.edu; Mherwick@planning.lacounty.gov; jsadro@lahabraca.gov; ShaunaC@Lhhcity.org; Jboynton@cityoflamirada.org; rbobadilla@pico-rivera.org; thaddeusmccormack@santafesprings.org; ghyde@lacs.org; gfarber@dpw.lacounty.gov; Dave.Klinger@pihhealth.org; JByerrum@cdwc.com; tmedina@swwc.com; tadams@charter.net; jeff.mcluckey@vzw.com; Javier.rameriz@sce.com; jemerson@siemprautilities.com; jmcneil@whittiercity.net; dpassalacqua@ewcsd.org; mkeriakous@whittier.net; david.pasillas@wuhd.org; jsierra@fjuhsd.net; cmcnamara@cityofwhittier.org

Subject: City of Whittier's Draft 2015 Natural Hazards Mitigation Plan Update - Request for Comments

The City of Whittier is in the process of updating its 2010 Natural Hazards Mitigation Plan (NHMP) or "Hazard Mitigation Plan." The document was prepared in response to Congress' Disaster Mitigation Act (DMA) of 2000. The DMA requires State and local governments to prepare hazard mitigation plans to document their hazard mitigation planning process and identify hazards, potential losses, mitigation needs, goals, and strategies.

Please find attached to this e-mail the City of Whittier's Draft 2015 Hazard Mitigation Plan. As you are a service provider to the City of Whittier or because you are an adjoining local jurisdiction, your comments, suggestions and input into City's Draft 2015 Hazard Mitigation Plan is requested.

If you would kindly forward any comments you may back to me by Friday, October 23, 2015, it would be greatly appreciated. If you have any questions, please do not hesitate to contact me.

Many thanks!

Sincerely,

Don Dooley, Planning Services Manager
13230 Penn Street
Whittier, California 90602
Tel: (562) 567-9342
Fax: (562) 567-2872



Attachment: City Website Posting Draft Mitigation Plan





Attachment: Noticing for City Council Public Hearing

Legal No. 0010723971

**NOTICE OF PUBLIC AVAILABILITY FOR
REVIEW AND COMMENT ON THE
2015 UPDATE TO THE CITY OF WHITTIER'S
NATURAL HAZARDS MITIGATION PLAN**

The City of Whittier is in the process of updating its 2010 Natural Hazards Mitigation Plan (NHMP) or "Hazard Mitigation Plan." The document was prepared in response to Congress' Disaster Mitigation Act (DMA) of 2000. The DMA requires State and local governments to prepare hazard mitigation plans to document their hazard mitigation planning process and identify hazards, potential losses, mitigation needs, goals, and strategies. Public input on the City's Draft 2015 Hazard Mitigation Plan Update is encouraged. The document is available for review on the City of Whittier's website at: <http://www.cityofwhittier.org> as well as at Whittier City Hall (Community Development Department) located at 13230 Penn Street, Whittier, CA. Copies of the Draft Hazard Mitigation Plan are also available at the reference desk at the Whittwood Branch Public Library located at: 10537 Santa Gertrudes Ave, Whittier, CA and at the Whittier Public Library located at 7344 Washington Ave, Whittier, CA. Please forward your comments to Don Dooley, Planning Services Manager at ddooley@cityofwhittier.org now through November 10, 2015.

Don Dooley,
Planning Services Manager
Publish: Oct 13, 2015 Whittier Daily News #723971



Attachment: City Council Staff Report



Agenda Report

Date: November 10, 2015
To: Jeffrey W. Collier, City Manager
From: Conal McNamara, Community Development Director
Subject: 2015 City of Whittier Natural Hazards Mitigation Plan Update

RECOMMENDATION

Staff recommends that the City Council adopt the attached Resolution approving the 2015 City of Whittier Natural Hazards Mitigation Plan Update.

BACKGROUND

The City of Whittier's Natural Hazards Mitigation Plan (NHMP) or "Hazard Mitigation Plan" was prepared in response to Congress' Disaster Mitigation Act (DMA) of 2000. The DMA requires state and local governments to prepare hazard mitigation plans to document their hazard mitigation planning process, identify hazards, potential losses, mitigation needs, goals, and strategies. This type of planning supplements the City's comprehensive emergency management program.

Under DMA 2000, each state and local government must have a federally approved hazard mitigation plan to be eligible for hazard mitigation grant funding. To comply, the City of Whittier developed its original Hazard Mitigation Plan in 2004 and an update in 2010, which is now being superseded by the proposed 2015 NHMP update. The Federal Emergency Management Agency (FEMA) mandates updates every five years.

Whittier's NHMP is organized into three parts. Part I: Background contains an Introduction and Community Profile; Part II: Hazard Analysis contains Risk Assessment and Hazard-Specific Sections; Part III: Mitigation Strategies contains Mitigation Strategies, Planning Process, and Plan Maintenance; and Part IV: Appendices.

The City's Hazard Mitigation Planning Team (Planning Team), consisting of City staff from various departments used FEMA's guidelines to accomplish the following:

- Develop a Planning Team;
- Identify hazards of concern (particularly floods, fires and earthquakes);
- Profile these hazards;
- Estimate inventory at risk and potential losses associated with these hazards;
- Develop mitigation strategies and goals that address these hazards; and,
- Develop plan maintenance procedures for implementation after the California Office of Emergency Services (Cal OES) review and the Federal Emergency Management Agency (FEMA) approves the mitigation plan.

As required by DMA 2000, the City has proactively notified the community about the City's hazard mitigation planning process and solicited public comments/input (between

Agenda Item: _____



_____, 2015, to _____, 2015) through a variety of different methods such as: advertising on the City's cable channel, website, newsletter, the Whittier Daily News, and within Whittier City Hall and its libraries. In addition, key emergency responders such as the Los Angeles County Fire Department and the Whittier Police Department shared their expertise during the planning process with the community. Therefore, the attached 2015 Natural Hazards Mitigation Plan documents the process and outcome of the City's mitigation planning efforts.

It is also important to note that the City will continue to incorporate mitigation planning as an integral component of City operations through existing processes, procedures and programs, as identified in the Mitigation Actions Matrix. Emphasis on mitigating earthquakes, floods, wildfires, and drought have been given particular attention, as these four natural hazards have historically posed the greatest threats to Whittier.

As part of the 2015 Plan update, the Planning Team also identified five mitigation goals that summarize the hazard reduction outcomes desired. These include:

- Protecting Life and Property;
- Enhancing Public Awareness;
- Protecting Natural Systems;
- Increasing Partnerships and Implementation; and,
- Improving Emergency Services

These goals, along with their corresponding objectives, guided the development and implementation of specific mitigation activities. In fact, many of the mitigation objectives and action items come from current programs. Emphasis was also placed on the effectiveness of the activities with respect to their estimated cost(s). Existing documents including the City's General Plan, County of Los Angeles All-Hazards Mitigation Plan, and the State of California Hazard Mitigation Plan all served as resources throughout the update process.

DISCUSSION

No public comments were received concerning Whittier's proposed 2015 NHMP update. Once adopted by the City Council, the document will be forwarded to Cal OES for review and submission to FEMA for approval.

FISCAL IMPACT

City Council approval and FEMA certification of the City's 2015 Natural Hazards Mitigation Plan Update will allow the City of Whittier to be eligible to receive untold money in Federal assistance in the event of a natural disaster in the City. Failure to approve the document or to receive certification from FEMA could cost the City significant sums of money that would not be reimbursable through FEMA in the event of a natural disaster in the City.



Agenda Report – 2015 Whittier Natural Hazards Mitigation Plan Update
November 10, 2015

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Submitted by:

Conal McNamara
Community Development Director

Prepared by:

Don Dooley
Planning Services Manager

Attachments:

- A) Draft City Council Resolution
- B) Proposed 2015 City of Whittier Natural Hazards Mitigation Plan Update (dated November 10, 2015).



Attachment: City Council Resolution

RESOLUTION NO. 8741

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF WHITTIER, CALIFORNIA, ADOPTING ITS 2015 NATURAL HAZARDS MITIGATION PLAN UPDATE

WHEREAS, the Whittier City Council originally adopted the City's Natural Hazards Mitigation Plan (NHMP) on September 14, 2004, under City Council Resolution No. 7712, pursuant to the Federal Disaster Management Act of 2000;

WHEREAS, the City of Whittier's current NHMP was adopted by the City Council on March 23, 2010, under City Council Resolution No. 8275;

WHEREAS, the City's NHMP focuses on the potential impacts of earthquakes, floods and wildfires in addition to including an assessment of these natural hazards, a plan to mitigate them, and methods of monitoring, evaluating and continuing to update the City's NHMP at least every five years;

WHEREAS, the City's 2015 NHMP update was formally noticed to the community of its availability for public review and comment through a variety of different outlets such as: the City's website, cable channel, the Whittier Daily News, within Whittier City Hall, and in all City of Whittier libraries (between September 23, 2015, through October 23, 2015) to solicit the community's input into the City's 2015 NHMP update;

WHEREAS, the City's 2015 NHMP update has been determined to be Categorically Exempt pursuant to Section 15308 (Class 8 – Actions by Regulatory Agencies for Protection of the Environment) of the California Environmental Quality Act; and

WHEREAS, the City Council conducted a duly noticed public hearing on the City's 2015 NHMP update at its regularly scheduled meeting of November 10, 2015, and fully reviewed and considered all changes to the document after opening up the public hearing and taking all public testimony as well as reviewing all written comments received concerning the document.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF WHITTIER, CALIFORNIA, DOES RESOLVE AS FOLLOWS:

SECTION 1. The City Council has determined that the 2015 City of Whittier NHMP update is complete and adequate and complies with all State and Federal requirements.

SECTION 2. The City Council does hereby authorize the City Manager to amend and update the 2015 Whittier NHMP as required by Cal OES and/or FEMA for certification of the adopted Plan and to initiate implementation of the NHMP in



Resolution No. 8741

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conjunction with making any necessary corrections/modifications to the document as required by changes in hazards or the City's capability to mitigate against hazards.

SECTION 3. The City Council does authorize the City Clerk-Treasurer to certify to the passage and adoption of this resolution for the City's 2015 NHMP update and to forward a copy of the City's 2015 NHMP update to Cal OES and FEMA for certification.

APPROVED AND ADOPTED this 10th day of November 2015.


FERNANDO DUTRA, Mayor

ATTEST:


KATHRYN A. MARSHALL
City Clerk-Treasurer



Resolution No. 8741

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CITY OF WHITTIER)
) SS
STATE OF CALIFORNIA)

I, Kathryn A. Marshall, City Clerk-Treasurer in and for the City of Whittier, California, hereby certify that the foregoing resolution was duly introduced and adopted at a regular meeting of the City Council of said City held on the 10th day of November 2015, by the following roll call vote:

AYES: O. Newcomer C. Warner R.L. Henderson
 J.A. Vinastieri F. Dutra
NOES: None
ABSENT: None

WITNESS my hand and the official seal of the City of Whittier, California, this
14th day of November, 2015.

Kathryn A. Marshall
KATHRYN A. MARSHALL
City Clerk-Treasurer

I HEREBY CERTIFY THIS TO BE A TRUE AND
CORRECT COPY OF THE ORIGINAL DOCUMENT
ON FILE WITH THE CITY OF WHITTIER, WITNESS
MY HAND AND THE OFFICIAL SEAL OF THE CITY
OF WHITTIER THIS 17th DAY OF
November, 2015.

Isabelle Morales
DEPUTY CITY CLERK

Attachment: Planning Team Sign-In Sheets

City of Whittier Hazard Mitigation Plan Update Planning Team April 13, 2015

Name	Department
CAROLYN HARSHMAN	EMERGENCY PLANNING CONSULTANTS
GREG ALANIZ	Parks + RECREATION
CHRIS MAGDOOSKU	PUBLICWORKS/ENGINEERING
David Edgell	Public works / STREETS
JAY TATMAN	POLICE
Sonya Lui	Community Development
SAREO MAJAS	PUBLIC WORKS - WATER
DON DOOLEY	COMMUNITY DEVELOPMENT DEPT. (PLANNING)
Carlos Yado	ADD (Building Safety)
DEVIN TROJE	FIRE dtrone@fire.lacounty.gov



City of Whittier
Hazard Mitigation Plan Update Planning Team
May 12, 2015



Name	Department
CAROLYN HARSHMAN	EMERGENCY PLANNING CONSULTANTS
Sonyia hui	Community Development
DEVIN TRONE	LACOUNTY FIRE
GREG ACARWIZ	Parks, Rec., & Community Services
JAY TATMAN	Police
JARED MALIAS	Public Works
Carol Hasse	Admin.
Brett Petraitis	Contractors/Emergency Management
Yolanda Martinez	Controller's Risk Mgmt. Div.
David Edgell	P/W STREETS
CHRIS MAGDOSKU	PUBLIC WORKS, ENGINEERING DIV.
Carlos Vado	Building & Safety
Don Dopley	COMMUNITY DEVELOPMENT (PLANNING)

City of Whittier
Hazard Mitigation Plan Update Planning Team
June 9, 2015

Name	Department
CAROLYN HARRISMAN	EMERGENCY PLANNING CONSULTANTS
CHRIS MAGDOSKO	ABYC WORKS-ENGINEERING
CARL HASSEL	CM'S OFFICE
DON DOOLEY	Community Development
JOLANDA MARTINEZ	CONTROLLERS
Carlos Yaulo	BIS
Sonyia Lui	Community Development





Section 11: Plan Maintenance

The Plan Maintenance section of this document details the formal process that will ensure that the Mitigation Plan remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing a plan revision every five years. This section describes how the City will integrate public participation throughout the plan maintenance process.

Method and Scheduling of Plan Implementation*

The Planning Team that was involved in research and writing of the Plan will also be responsible for implementation. The Planning Team will be led jointly by the Planning Services Manager and the Human Resources & Risk/Emergency Manager (Joint Chairs). Please refer to the Credits on page 2 of the Plan for a full list of Planning Team members.

	Year 1	Year 2	Year 3	Year 4	Year 5
Monitoring	X	X	X	X	X
Evaluating					X
Updating					X

Monitoring and Implementing the Plan

Plan Adoption

Adoption of the Mitigation Plan by the City's governing body is one of the prime requirements for approval of the plan. Once the plan is completed, the City Council will be responsible for adopting the Mitigation Plan. The governing body has the responsibility and authority to promote sound public policy regarding hazards. The local agency governing body will have the authority to periodically update the plan as it is revised to meet changes in the hazard risks and exposures in the City. The approved Mitigation Plan will be significant in the future growth and development of the City.

The City Council will be responsible for adopting the Mitigation Plan. This governing body has the authority to promote sound public policy regarding hazards. Once the plan has been adopted, the Joint Chairs will be responsible for submitting it to the State Hazard Mitigation Officer at California Office of Emergency Services (Cal OES) for review. Cal OES will then submit the plan to the Federal Emergency Management Agency (FEMA) for approval. This review will address the requirements set forth in 44 C.F.R. Section 201.6 (Local Mitigation Plans). Upon acceptance by FEMA, City of Whittier will gain eligibility for Hazard Mitigation Grant Program funds.

* ELEMENT A: PLANNING PROCESS | A6

A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))



Convener

The City Council will adopt the Mitigation Plan and the Planning Team will take responsibility for plan maintenance and implementation. The Planning Services Manager, will serve as a convener to facilitate the Planning Team meetings, and will assign tasks such as updating and presenting the Plan to the members of the Planning Team. Plan implementation and evaluation will be a shared responsibility among all of the Planning Team members. The Planning Services Manager will have authority to prepare and approve future amendments to the Mitigation Plan with 5-year updates to FEMA resubmitted to the City Council for adoption.

Planning Team

The Planning Team will be responsible for coordinating implementation of plan action items and undertaking the formal review process. The convener will assign representatives from City departments, divisions, and agencies, including, but not limited to, the current Planning Team.

In order to make the Planning Team as broad and useful as possible, the Planning Services Manager may choose to involve other relevant organizations and agencies in hazard mitigation. These additional appointments could include:

- ✓ A representative from the American Red Cross
- ✓ A representative from a county government emergency response agency

The Planning Team will meet no less than annually. Meeting dates will be scheduled once the final Planning Team has been established. These meetings will provide an opportunity to discuss the progress of the action items and maintain the partnerships that are essential for the sustainability of the mitigation plan.

*Implementation through Existing Programs**

The City of Whittier addresses statewide planning goals and legislative requirements through its General Plan, its Capital Improvement Plan, and Building and Safety Codes. The Mitigation Plan provides a series of recommendations - many of which are closely related to the goals and objectives of existing planning programs. The City of Whittier will implement recommended mitigation action items through existing programs and procedures.

The City's Community Development Department- Building and Safety Division is responsible for adhering to the State of California's Building and Safety Codes. In addition, the Planning Team will work with other agencies at the state level to review, develop and ensure Building and Safety Codes are adequate to mitigate or present damage by hazards. This is to ensure that life-safety criteria are met for new construction.

*** ELEMENT C. MITIGATION STRATEGY | C6**

C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))



Some of the goals and action items in the Mitigation Plan will be achieved through activities recommended in the CIP. Various City departments develop the CIP and review it on an annual basis. Upon annual review of the CIP, the Planning Team will work with the City departments to identify areas that the Mitigation Plan action items are consistent with CIP goals and integrate them where appropriate.

Within six months of formal adoption of the Mitigation Plan, the recommendations listed above will be incorporated into the process of existing planning mechanisms at the City level. The meetings of the Planning Team will provide an opportunity for Planning Team members to report back on the progress made on the integration of mitigation planning elements into City planning documents and procedures.

Economic Analysis of Mitigation Projects

FEMA's approach to identify the costs and benefits associated with hazard mitigation strategies, measures, or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis.

Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later.

Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating hazards can provide decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Given federal funding, the Planning Team will use a FEMA-approved benefit/cost analysis approach to identify and prioritize mitigation action items. For other projects and funding sources, the Planning Team will use other approaches to understand the costs and benefits of each action item and develop a prioritized list. For more information regarding economic analysis of mitigation action items, please see Appendix B: Benefit/Cost Analysis.

Evaluating and Updating the Plan*

Formal Review Process

The Mitigation Plan will be evaluated on an annual basis to determine the effectiveness of programs, and to reflect changes in land development or programs that may affect mitigation priorities. The evaluation process includes a firm schedule and timeline, and identifies the agencies and organizations participating in plan evaluation. The Convener or designee will be responsible for contacting the Planning Team members and organizing the annual meeting. Planning Team members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan.

*** ELEMENT A: PLANNING PROCESS | A6**

A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))



The Planning Team will review the goals and action items to determine their relevance to changing situations in the City, as well as changes in State or Federal policy, and to ensure they are addressing current and expected conditions. The Planning Team will also review Section 3: Risk Assessment portion of the Plan to determine if this information should be updated or modified, given any new available data. The coordinating organizations responsible for the various action items will report on the status of their projects, the success of various implementation processes, difficulties encountered, success of coordination efforts, and which strategies should be revised.

The Convener will assign the duty of updating the Plan to one or more of the Planning Team members. The designated Planning Team members will have three months to make appropriate changes to the Plan before submitting it to the Planning Team members. The Planning Team will also notify all holders of the City plan when changes have been made. Every five years the updated plan will be submitted to the State Hazard Mitigation Officer at the California Office of Emergency Services and the Federal Emergency Management Agency for review and approval.

*Continued Public Involvement**

The City of Whittier is dedicated to involving the public directly in the continual review and updates to the Mitigation Plan. Copies of the plan will be catalogued and made available at City Hall and at all City operated public libraries. The existence and location of these copies will be publicized in City newsletters and on the City website. This site will also contain an email address and phone number where people can direct their comments and concerns. A public meeting will also be held after each evaluation or when deemed necessary by the Planning Team. The meetings will provide the public a forum in which they can express their concerns, opinions, or ideas about the Plan.

The Public Information Officer will be responsible for using City resources to publicize the annual public meetings and maintain public involvement through the public access channel, web page, and newspapers.

*** ELEMENT A: PLANNING PROCESS | A5**

A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))



Part IV: APPENDIX

Benefit/Cost Analysis

Benefit/cost analysis is a key mechanism used by the California Office of Emergency Services, the Federal Emergency Management Agency, and other state and federal agencies in evaluating hazard mitigation projects, and is required by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended.

This appendix outlines several approaches for conducting economic analysis of hazard mitigation projects. It describes the importance of implementing mitigation activities, different approaches to economic analysis of mitigation strategies, and methods to calculate costs and benefits associated with mitigation strategies. Information in this section is derived in part from: The Interagency Hazards Mitigation Team, State Mitigation Plan, and Federal Emergency Management Agency Publication 331, Report on Costs and Benefits of Hazard Mitigation.

This section is not intended to provide a comprehensive description of benefit/cost analysis, nor is it intended to provide the details of economic analysis methods that can be used to evaluate local projects. It is intended to: 1) raise benefit/cost analysis as an important issue, and 2) provide some background on how economic analysis can be used to evaluate mitigation projects.

Why Evaluate Mitigation Strategies?

Mitigation activities reduce the cost of disasters by minimizing property damage, injuries, and the potential for loss of life, and by reducing emergency response costs, which would otherwise be incurred.

Evaluating hazard mitigation provides decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Evaluating hazard mitigation provides decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects. Evaluating mitigation projects is a complex and difficult undertaking, which is influenced by many variables.

First, natural disasters affect all segments of the communities they strike, including individuals, businesses, and public services such as fire, police, utilities, and schools. Second, while some of the direct and indirect costs of disaster damages are measurable, some of the costs are non-financial and difficult to quantify in dollars. Third, many of the impacts of such events produce “ripple-effects” throughout the community, greatly increasing the disaster’s social and economic consequences.

While not easily accomplished, there is value, from a public policy perspective, in assessing the positive and negative impacts from mitigation activities, and obtaining an instructive benefit/cost comparison.



Otherwise, the decision to pursue or not pursue various mitigation options would not be based on an objective understanding of the net benefit or loss associated with these actions.

What are Some Economic Analysis Approaches for Mitigation Strategies?

The approaches used to identify the costs and benefits associated with hazard mitigation strategies, measures, or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis. The distinction between the two methods is the way in which the relative costs and benefits are measured. Additionally, there are varying approaches to assessing the value of mitigation for public sector and private sector activities.

Benefit/Cost Analysis

Benefit/cost analysis is used in hazards mitigation to show if the benefits to life and property protected through mitigation efforts exceed the cost of the mitigation activity. Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster related damages later. Benefit/cost analysis is based on calculating the frequency and severity of a hazard, avoided future damages, and risk.

In benefit/cost analysis, all costs and benefits are evaluated in terms of dollars, and a net benefit/cost ratio is computed to determine whether a project should be implemented (i.e., if net benefits exceed net costs, the project is worth pursuing). A project must have a benefit/cost ratio greater than 1 in order to be funded.

Cost-Effectiveness Analysis

Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. This type of analysis, however, does not necessarily measure costs and benefits in terms of dollars. Determining the economic feasibility of mitigating hazards can also be organized according to the perspective of those with an economic interest in the outcome. Hence, economic analysis approaches are covered for both public and private sectors as follows.

Investing in public sector mitigation activities

Evaluating mitigation strategies in the public sector is complicated because it involves estimating all of the economic benefits and costs regardless of who realizes them, and potentially to a large number of people and economic entities. Some benefits cannot be evaluated monetarily, but still affect the public in profound ways.

Economists have developed methods to evaluate the economic feasibility of public decisions that involve a diverse set of beneficiaries and non-market benefits.

Investing in private sector mitigation activities

Private sector mitigation projects may occur on the basis of one of two approaches: it may be mandated by a regulation or standard, or it may be economically justified on its own merits. A building or landowner, whether a private entity or a public agency, required to conform to a mandated standard may consider the following options:



1. Request cost sharing from public agencies
2. Dispose of the building or land either by sale or demolition
3. Change the designated use of the building or land and change the hazard mitigation compliance requirement; or
4. Evaluate the most feasible alternatives and initiate the most cost effective hazard mitigation alternative

The sale of a building or land triggers another set of concerns. For example, real estate disclosure laws can be developed which require sellers of real property to disclose known defects and deficiencies in the property, including earthquake weaknesses and hazards to prospective purchasers. Correcting deficiencies is expensive and time consuming, but their existence can prevent the sale of the building. Conditions of a sale regarding the deficiencies and the price of the building can be negotiated between a buyer and seller.

How Can an Economic Analysis be Conducted?

Benefit/cost analysis and cost-effectiveness analysis are important tools in evaluating whether or not to implement a mitigation activity. A framework for evaluating alternative mitigation activities is outlined below:

1. Identify the Alternatives: Alternatives for reducing risk from hazards includes structural projects to enhance disaster resistance, education and outreach, and acquisition or demolition of exposed properties, among others. Different mitigation project assists in minimizing risk to hazards, but do so at varying economic costs.

2. Calculate the Costs and Benefits: Choosing economic criteria is essential to systematically calculating costs and benefits of mitigation projects and selecting the most appropriate alternative. Potential economic criteria to evaluate alternatives include:

- ✓ **Determine the project cost.** This may include initial project development costs, and repair and operating costs of maintaining projects over time.
- ✓ **Estimate the benefits.** Projecting the benefits or cash flow resulting from a project can be difficult. Expected future returns from the mitigation effort depend on the correct specification of the risk and the effectiveness of the project, which may not be well known. Expected future costs depend on the physical durability and potential economic obsolescence of the investment. This is difficult to project. These considerations will also provide guidance in selecting an appropriate salvage value. Future tax structures and rates must be projected. Financing alternatives must be researched, and they may include retained earnings, bond and stock issues, and commercial loans.
- ✓ **Consider costs and benefits to society and the environment.** These are not easily measured, but are assessed through a variety of economic tools including existence value or contingent value theories. These theories provide quantitative data on the value people attribute to physical or social environments. Even without hard data, however, impact of structural projects to the physical environment or to society should be considered when implementing mitigation projects.



- ✓ **Determine the correct discount rate.** Determination of the discount rate can just be the risk-free cost of capital, but it may include the decision maker's time preference and also a risk premium. Including inflation should also be considered.

3. Analyze and Rank the Alternatives: Once costs and benefits have been quantified, economic analysis tools can rank the alternatives. Two methods for determining the best alternative given varying costs and benefits include net present value and internal rate of return.

- ✓ **Net present value.** Net present value is the value of the expected future returns of an investment minus the value of expected future cost expressed in today's dollars. If the net present value is greater than the project costs, the project is determined feasible for implementation. Selecting the discount rate, and identifying the present and future costs and benefits of the project calculates the net present value of projects.
- ✓ **Internal Rate of Return.** Using the internal rate of return method to evaluate mitigation projects provides the interest rate equivalent to the dollar returns expected from the project. Once the rate has been calculated, it is compared to rates earned by investing in alternative projects. Projects may be feasible to implement when the internal rate of return is greater than the total costs of the project.

Once the mitigation projects are ranked on the basis of economic criteria, decision-makers can consider other factors, such as risk; project effectiveness; and economic, environmental, and social returns in choosing the appropriate project for implementation.

How are Benefits of Mitigation Calculated?

Economic Returns of Hazard Mitigation

The estimation of economic returns, which accrue to building or land owner as a result of hazard mitigation, is difficult. Owners evaluating the economic feasibility of mitigation should consider reductions in physical damages and financial losses. A partial list follows:

- ✓ Building damages avoided
- ✓ Content damages avoided
- ✓ Inventory damages avoided
- ✓ Rental income losses avoided
- ✓ Relocation and disruption expenses avoided
- ✓ Proprietor's income losses avoided

These parameters are estimated using observed prices, costs, and engineering data. The difficult part is to correctly determine the effectiveness of the hazard mitigation project and the resulting reduction in damages and losses. Equally as difficult is assessing the probability that an event will occur. The damages and losses should only include those that will be borne by the owner. The salvage value of the investment are important in determining economic feasibility. Salvage value becomes more important as the time horizon of the owner declines. This is important because most businesses depreciate assets over a period of time.



Additional Costs from Hazards

Property owners should also assess changes in a broader set of factors that change as a result of a large natural disaster. These are usually termed “indirect” effects, but they have a very direct effect on the economic value of the owner’s building or land. They are positive or negative, and include changes in the following:

- ✓ Commodity and resource prices
- ✓ Availability of resource supplies
- ✓ Commodity and resource demand changes
- ✓ Building and land values
- ✓ Capital availability and interest rates
- ✓ Availability of labor
- ✓ Economic structure
- ✓ Infrastructure
- ✓ Regional exports and imports
- ✓ Local, state, and national regulations and policies
- ✓ Insurance availability and rates

Changes in the resources and industries listed above are more difficult to estimate and require models that are structured to estimate total economic impacts. Total economic impacts are the sum of direct and indirect economic impacts. Total economic impact models are usually not combined with economic feasibility models. Many models exist to estimate total economic impacts of changes in an economy. Decision makers should understand the total economic impacts of natural disasters in order to calculate the benefits of a mitigation activity. This suggests that understanding the local economy is an important first step in being able to understand the potential impacts of a disaster, and the benefits of mitigation activities.

Additional Considerations

Conducting an economic analysis for potential mitigation activities can assist decision-makers in choosing the most appropriate strategy for their community to reduce risk and prevent loss from hazards. Economic analysis saves time and resources from being spent on inappropriate or unfeasible projects. Several resources and models are listed on the following page that assist in conducting an economic analysis for hazard mitigation activities.

Benefit/cost analysis is complicated, and the numbers may divert attention from other important issues. It is important to consider the qualitative factors of a project associated with mitigation that cannot be evaluated economically. There are alternative approaches to implementing mitigation projects. Many communities are looking towards developing multi-objective projects. With this in mind, opportunity rises to develop strategies that integrate hazard mitigation with projects related to watersheds, environmental planning, community economic development, and small business development, among others. Incorporating hazard mitigation with other community projects can increase the viability of project implementation.



Resources

CUREe Kajima Project, Methodologies For Evaluating The Socio-Economic Consequences Of Large Earthquakes, Task 7.2 Economic Impact Analysis, Prepared by University of California, Berkeley Team, Robert A. Olson, VSP Associates, Team Leader; John M. Eidinger, GandE Engineering Systems; Kenneth A. Goettel, Goettel and Associates Inc.; and Gerald L. Horner, Hazard Mitigation Economics Inc., 1997.

Federal Emergency Management Agency, Benefit/Cost Analysis of Hazard Mitigation Projects, Riverine Flood, Version 1.05, Hazard Mitigation Economics Inc., 1996.

Federal Emergency Management Agency Report on Costs and Benefits of Natural Hazard Mitigation. Publication 331, 1996.

Goettel and Horner Inc., Earthquake Risk Analysis Volume III: The Economic Feasibility of Seismic Rehabilitation of Buildings in The City of Portland, Submitted to the Bureau of Buildings, City of Portland, August 30, 1995.

Goettel and Horner Inc., Benefit/Cost Analysis of Hazard Mitigation Projects Volume V, Earthquakes, Prepared for FEMA's Hazard Mitigation Branch, October 25, 1995.

Horner, Gerald, Benefit/Cost Methodologies for Use in Evaluating the Cost Effectiveness of Proposed Hazard Mitigation Measures, Robert Olson Associates, Prepared for Oregon State Police, Office of Emergency Management, July 1999.

Interagency Hazards Mitigation Team, State Mitigation Plan, (Oregon State Police – Office of Emergency Management, 2000).

Risk Management Solutions, Inc., Development of a Standardized Earthquake Loss Estimation Methodology, National Institute of Building Sciences, Volume I and II, 1994.

VSP Associates, Inc., A Benefit/Cost Model for the Seismic Rehabilitation of Buildings, Volumes 1 and 2, Federal Emergency Management Agency, FEMA, Publication Numbers 227 and 228, 1991.

VSP Associates, Inc., Benefit/Cost Analysis of Hazard Mitigation Projects: Section 404 Hazard Mitigation Program and Section 406 Public Assistance Program, Volume 3: Seismic Hazard Mitigation Projects, 1993.

VSP Associates, Inc., Seismic Rehabilitation of Federal Buildings: A Benefit/Cost Model, Volume 1, Federal Emergency Management Agency, FEMA, Publication Number 255, 1994.

Central Basin

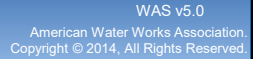
Municipal Water District



Appendix J

Water Audits

Water Audits for fiscal years 2017, 2018, 2019, and 2020 were prepared by the City using AWWA Free Water Audit Software v5.0. This audit includes a worksheet, water balance, performance indicators, and dashboard.

Reporting Worksheet 1



AWWA Free Water Audit Software: System Attributes and Performance Indicators

WAS v5.0

American Water Works Association.
Copyright © 2014, All Rights Reserved.Water Audit Report for: **Vernon Public Utilities**Reporting Year: **2016/2017** **7/2016 - 6/2017******* YOUR WATER AUDIT DATA VALIDITY SCORE IS: 65 out of 100 *****

System Attributes:

Apparent Losses:	237.774	acre-ft/yr
+	Real Losses:	317.691 acre-ft/yr
=	Water Losses:	555.465 acre-ft/yr

? Unavoidable Annual Real Losses (UARL): **See limits in definition** acre-ft/yrAnnual cost of Apparent Losses: **\$217,195**Annual cost of Real Losses: **\$183,845**Valued at **Variable Production Cost**
Return to Reporting Worksheet to change this assumption

Performance Indicators:

Financial:

Non-revenue water as percent by volume of Water Supplied: **8.0%**Non-revenue water as percent by cost of operating system: **5.6%** Real Losses valued at Variable Production Cost

Operational Efficiency:

Apparent Losses per service connection per day: **192.97** gallons/connection/dayReal Losses per service connection per day: **N/A** gallons/connection/dayReal Losses per length of main per day*: **5,752.86** gallons/mile/dayReal Losses per service connection per day per psi pressure: **N/A** gallons/connection/day/psiFrom Above, Real Losses = Current Annual Real Losses (CARL): **317.69** acre-feet/year? Infrastructure Leakage Index (ILI) [CARL/UARL]:

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline



AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.
Copyright © 2014, All Rights Reserved.Water Audit Report for: **Vernon Public Utilities**Reporting Year: **2016/2017****7/2016 - 6/2017**Data Validity Score: **65**

Own Sources (Adjusted for known errors) 6,539.764	Water Exported 0.000	Billed Water Exported				
	Water Supplied 7,151.544	Authorized Consumption 6,596.079	Billed Authorized Consumption 6,578.200	Billed Metered Consumption (water exported is removed) 6,578.200	Revenue Water	
				Billed Unmetered Consumption 0.000	6,578.200	
			Unbilled Authorized Consumption 17.879	Unbilled Metered Consumption 0.000	Non-Revenue Water (NRW)	
				Unbilled Unmetered Consumption 17.879	573.344	
		Water Losses 555.465	Apparent Losses 237.774	Unauthorized Consumption 17.879		
				Customer Metering Inaccuracies 203.449		
				Systematic Data Handling Errors 16.446		
		Water Imported 611.780		Real Losses 317.691	Leakage on Transmission and/or Distribution Mains Not broken down	
	Leakage and Overflows at Utility's Storage Tanks Not broken down					
Leakage on Service Connections Not broken down						



AWWA Free Water Audit Software: Dashboard

WAS v5.0

American Water Works Association.
Copyright © 2014, All Rights Reserved.

The graphic below is a visual representation of the Water Balance with bar heights proportional to the volume of the audit components

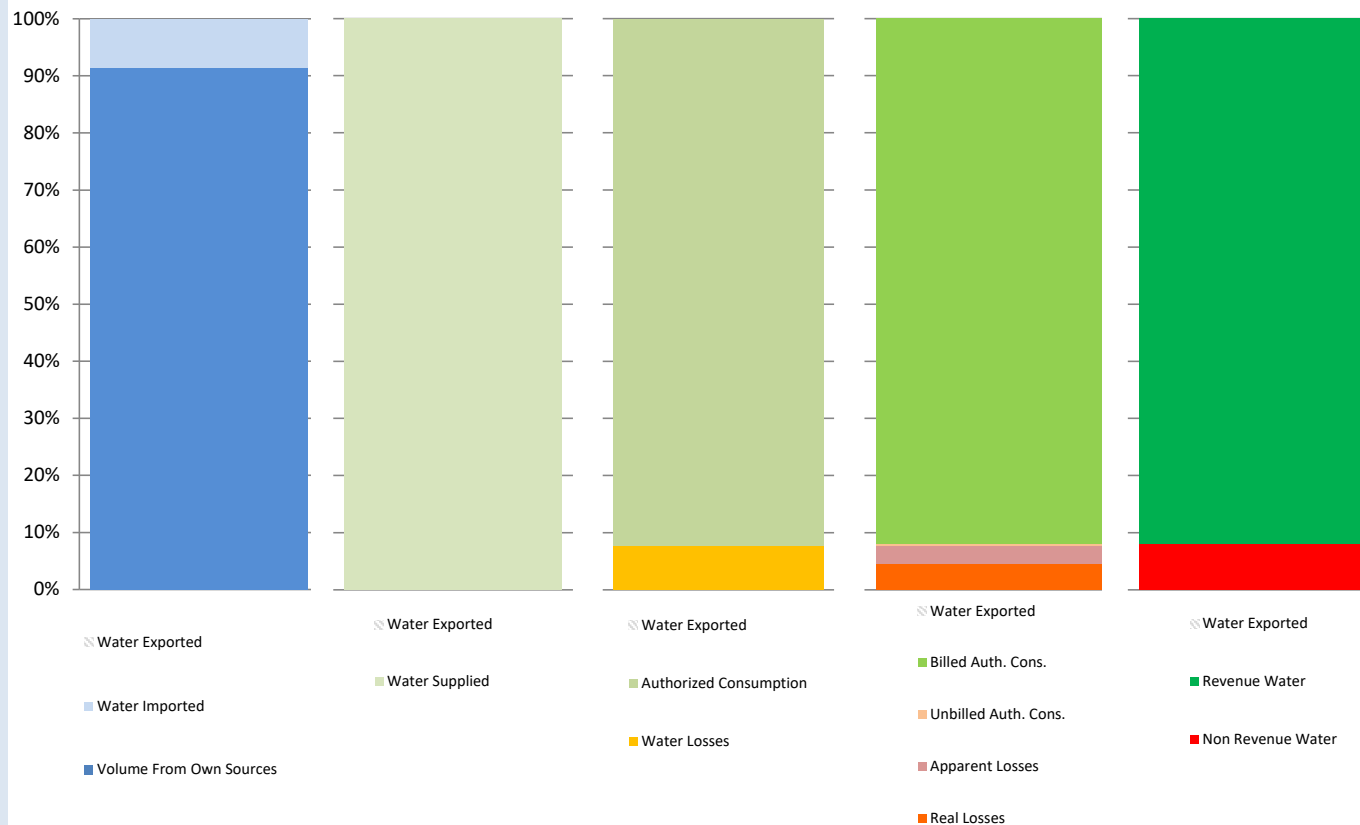
Water Audit Report for: **Vernon Public Utilities**

Reporting Year: **2016/2017** **7/2016 - 6/2017**

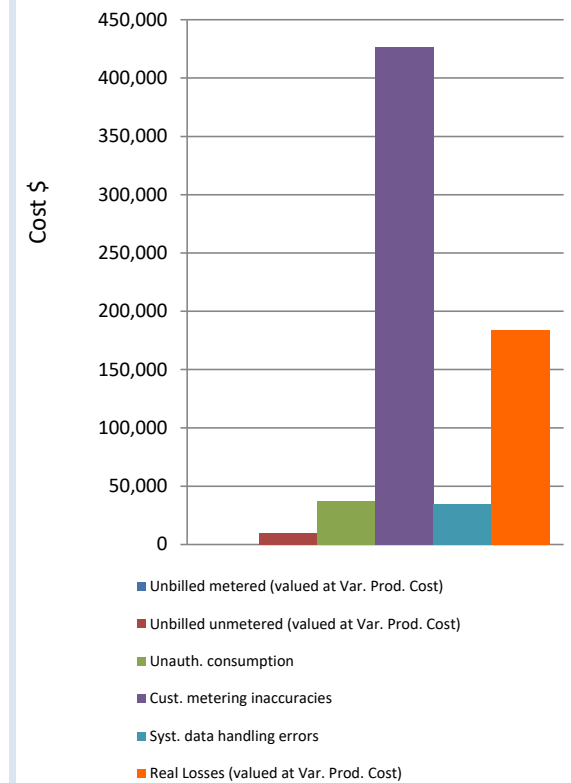
Data Validity Score: **65**

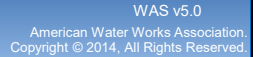
☐ Show me the VOLUME of Non-Revenue Water

☒ Show me the COST of Non-Revenue Water



Total Cost of NRW = \$692,803



Reporting Worksheet 1



AWWA Free Water Audit Software: System Attributes and Performance Indicators

WAS v5.0

American Water Works Association.
Copyright © 2014, All Rights Reserved.Water Audit Report for: **2017 Vernon Public Utilities (1910167)**Reporting Year: **2017/2018** **7/2017 - 6/2018******* YOUR WATER AUDIT DATA VALIDITY SCORE IS: 65 out of 100 *****

System Attributes:

Apparent Losses:	227.578	acre-ft/yr
+	Real Losses:	283.923 acre-ft/yr
=	Water Losses:	511.501 acre-ft/yr

? Unavoidable Annual Real Losses (UARL): **See limits in definition** acre-ft/yrAnnual cost of Apparent Losses: **\$213,136**Annual cost of Real Losses: **\$162,679**Valued at **Variable Production Cost**
Return to Reporting Worksheet to change this assumption

Performance Indicators:

Financial:

Non-revenue water as percent by volume of Water Supplied: **8.7%**Non-revenue water as percent by cost of operating system: **5.7%** Real Losses valued at Variable Production Cost

Operational Efficiency:

Apparent Losses per service connection per day: **205.43** gallons/connection/dayReal Losses per service connection per day: **N/A** gallons/connection/dayReal Losses per length of main per day*: **4,974.88** gallons/mile/dayReal Losses per service connection per day per psi pressure: **N/A** gallons/connection/day/psiFrom Above, Real Losses = Current Annual Real Losses (CARL): **283.92** acre-feet/year? Infrastructure Leakage Index (ILI) [CARL/UARL]:

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline



AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.
Copyright © 2014, All Rights Reserved.Water Audit Report for: **2017 Vernon Public Utilities (1910167)**Reporting Year: **2017/2018****7/2017 - 6/2018**Data Validity Score: **65**

Own Sources (Adjusted for known errors) 6,392.548	Water Exported 0.000	Billed Water Exported				
	Water Supplied 6,890.349	Authorized Consumption 6,378.848	Billed Authorized Consumption 6,292.719	Billed Metered Consumption (water exported is removed) 6,292.719	Revenue Water	
				Billed Unmetered Consumption 0.000	6,292.719	
			Unbilled Authorized Consumption 86.129	Unbilled Metered Consumption 0.000	Non-Revenue Water (NRW)	
				Unbilled Unmetered Consumption 86.129	597.630	
		Water Losses 511.501	Apparent Losses 227.578	Unauthorized Consumption 17.226		
				Customer Metering Inaccuracies 194.620		
				Systematic Data Handling Errors 15.732		
		Water Imported 497.801		Real Losses 283.923	Leakage on Transmission and/or Distribution Mains Not broken down	
	Leakage and Overflows at Utility's Storage Tanks Not broken down					
Leakage on Service Connections Not broken down						



AWWA Free Water Audit Software: Dashboard

WAS v5.0

American Water Works Association.
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The graphic below is a visual representation of the Water Balance with bar heights proportional to the volume of the audit components

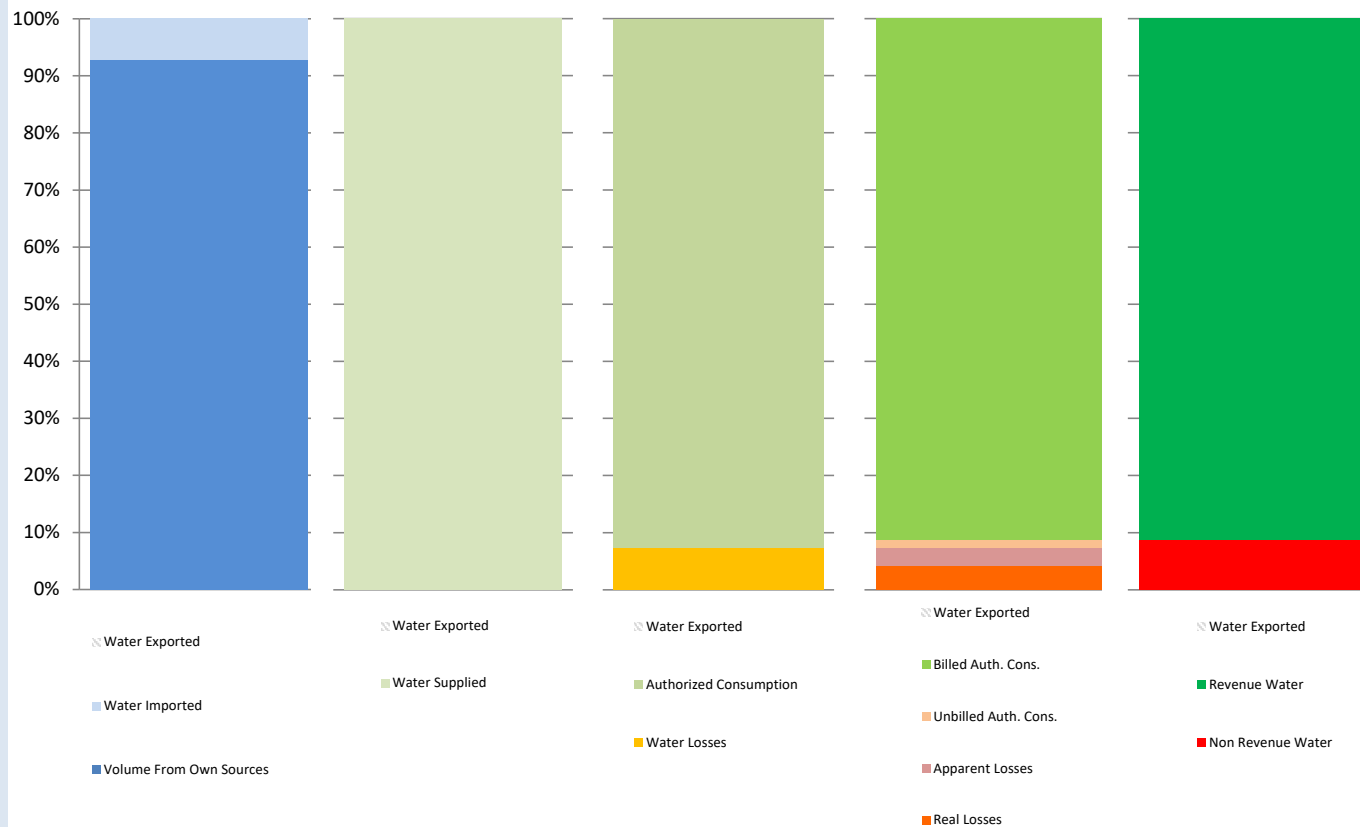
Water Audit Report for: **2017 Vernon Public Utilities (1910167)**

Reporting Year: **2017/2018** **7/2017 - 6/2018**

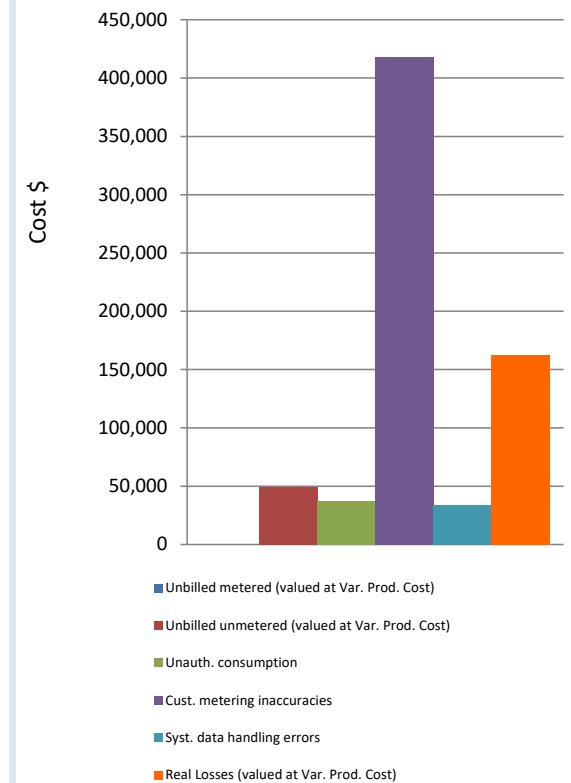
Data Validity Score: **65**

☐ Show me the VOLUME of Non-Revenue Water

☒ Show me the COST of Non-Revenue Water



Total Cost of NRW = \$701,321





AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0
American Water Works Association

? Click to access
* Click to add a

Water Audit Report for: **2018 Vernon Public Utilities (1910167)**
Reporting Year: **2018/2019** **7/2018 - 6/2019**

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

WATER SUPPLIED

Volume from own sources: 5 6,081.500 acre-ft/yr + ?
Water imported: 7 643.000 acre-ft/yr + ?
Water exported: n/a 0.000 acre-ft/yr + ?

Master Meter and Supply Error Adjustments

Pcnt: 3 0.90% () Value: acre-ft/yr
4 0.17% () Value: acre-ft/yr
 Value: acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: **6,669.163** acre-ft/yr

AUTHORIZED CONSUMPTION

Billed metered: 5 6,080.627 acre-ft/yr
Billed unmetered: n/a 0.000 acre-ft/yr
Unbilled metered: n/a 0.000 acre-ft/yr
Unbilled unmetered: 5 83.365 acre-ft/yr

Default option selected for Unbilled unmetered - a grading of 5 is applied but not displayed

AUTHORIZED CONSUMPTION: **6,163.991** acre-ft/yr

Click here: ?
for help using option

Pcnt: 1.25% () Value: acre-ft/yr

Use buttons to select
percentage of water supplied
OR
value

WATER LOSSES (Water Supplied - Authorized Consumption)

505.172 acre-ft/yr

Apparent Losses

Unauthorized consumption: 5 16.673 acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies: 3 188.061 acre-ft/yr
Systematic data handling errors: 5 15.202 acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: **219.935** acre-ft/yr

Pcnt: 0.25% () Value: acre-ft/yr

3.00% () Value: acre-ft/yr
 0.25% () Value: acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 5 285.237 acre-ft/yr

WATER LOSSES: **505.172** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **588.537** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains: 8 51.0 miles
Number of active AND inactive service connections: 8 977
Service connection density: ? 19 conn./mile main

Are customer meters typically located at the curbstop or property line? Yes (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line: + ?
Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 5 75.0 psi

COST DATA

Total annual cost of operating water system: 10 \$7,977,492 \$/Year
Customer retail unit cost (applied to Apparent Losses): 10 \$2.21 \$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses): 5 \$616.67 \$/acre-ft ☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 59 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources

2: Customer metering inaccuracies

3: Billed metered



AWWA Free Water Audit Software: System Attributes and Performance Indicators

WAS v5.0
American Water Works Association.

Water Audit Report for: **2018 Vernon Public Utilities (1910167)**

Reporting Year: **2018/2019** **7/2018 - 6/2019**

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 59 out of 100 ***

System Attributes:

Apparent Losses: **219.935** acre-ft/yr
+ Real Losses: **285.237** acre-ft/yr
= **Water Losses:** **505.172** acre-ft/yr

?

Unavoidable Annual Real Losses (UARL): **See limits in definition** acre-ft/yr

Annual cost of Apparent Losses: **\$211,726**

Annual cost of Real Losses: **\$175,897**

Valued at **Variable Production Cost**

Return to Reporting Worksheet to change this assumption

Performance Indicators:

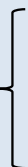
Financial:



Non-revenue water as percent by volume of Water Supplied: **8.8%**

Non-revenue water as percent by cost of operating system: **5.5%** Real Losses valued at Variable Production Cost

Operational



Apparent Losses per service connection per day: **200.97** gallons/connection/day

Real Losses per service connection per day: **N/A** gallons/connection/day

Real Losses per length of main per day*: **4,993.00** gallons/mile/day

Real Losses per service connection per day per psi pressure: **N/A** gallons/connection/day/psi

From Above, Real Losses = Current Annual Real Losses (CARL): **285.24** acre-feet/year

?

Infrastructure Leakage Index (ILI) [CARL/UARL]:

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline



AWWA Free Water Audit Software: Water Balance

WAS
American Water Works Association.
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Water Audit Report for: **2018 Vernon Public Utilities (1910167)**

Reporting Year: **2018/2019**

7/2018 - 6/2019

Data Validity Score: **59**

Own Sources (Adjusted for known errors) 6,027.255	Water Exported 0.000	Billed Water Exported				
	Water Supplied 6,669.163	Authorized Consumption 6,163.991	Billed Authorized Consumption 6,080.627	Billed Metered Consumption (water exported is removed) 6,080.627	Revenue Water 6,080.627	
				Billed Unmetered Consumption 0.000		
			Unbilled Authorized Consumption 83.365	Unbilled Metered Consumption 0.000	Non-Revenue Water (NRW) 588.537	
				Unbilled Unmetered Consumption 83.365		
		Water Losses 505.172	Apparent Losses 219.935	Unauthorized Consumption 16.673		
				Customer Metering Inaccuracies 188.061		
				Systematic Data Handling Errors 15.202		
			Water Imported 641.909	Real Losses 285.237	Leakage on Transmission and/or Distribution Mains Not broken down	
	Leakage and Overflows at Utility's Storage Tanks Not broken down					
Leakage on Service Connections Not broken down						



AWWA Free Water Audit Software: Dashboard

WAS v5.0
American Water Works Association.

The graphic below is a visual representation of the Water Balance with bar heights proportional to the volume of the audit components

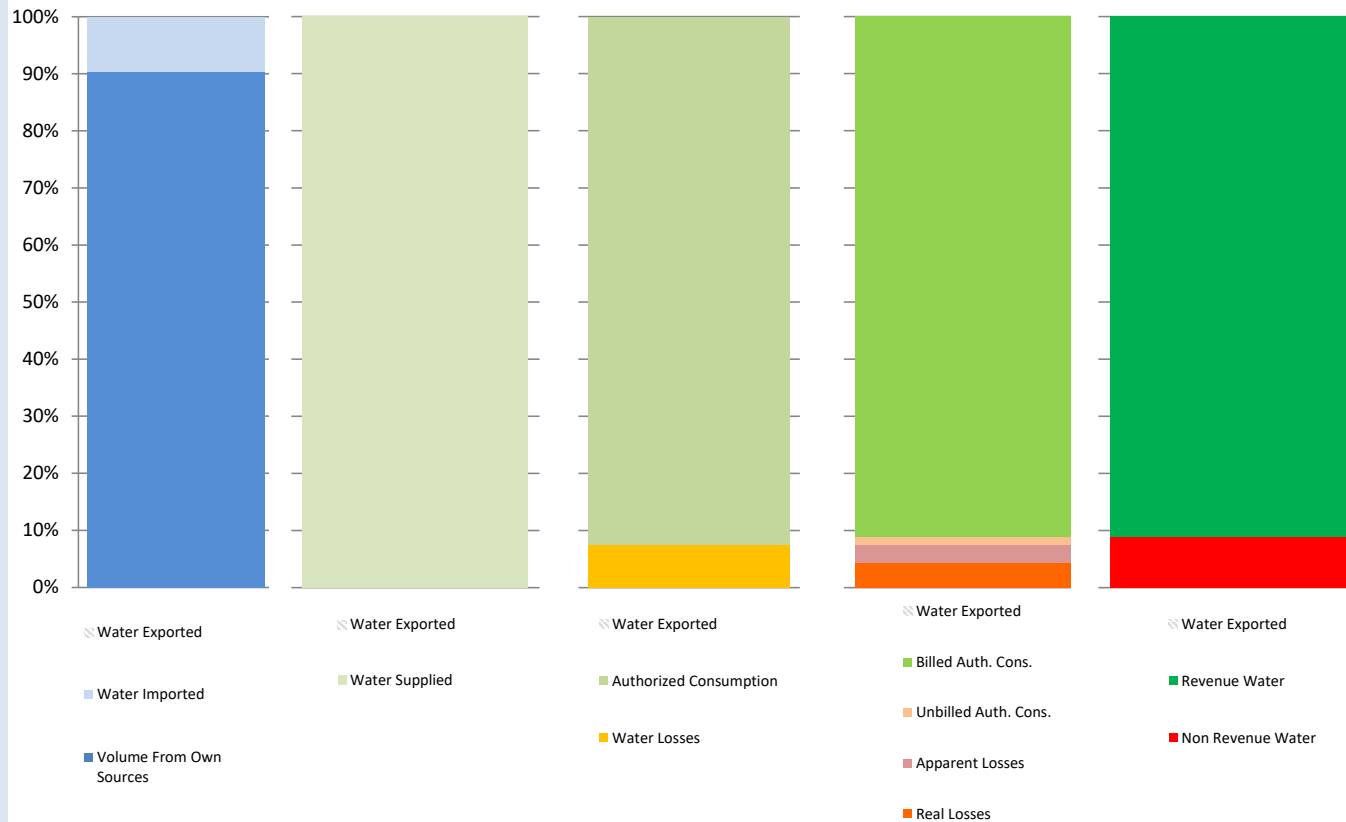
Water Audit Report for: **2018 Vernon Public Utilities (1910167)**

Reporting Year: **2018/2019** **7/2018 - 6/2019**

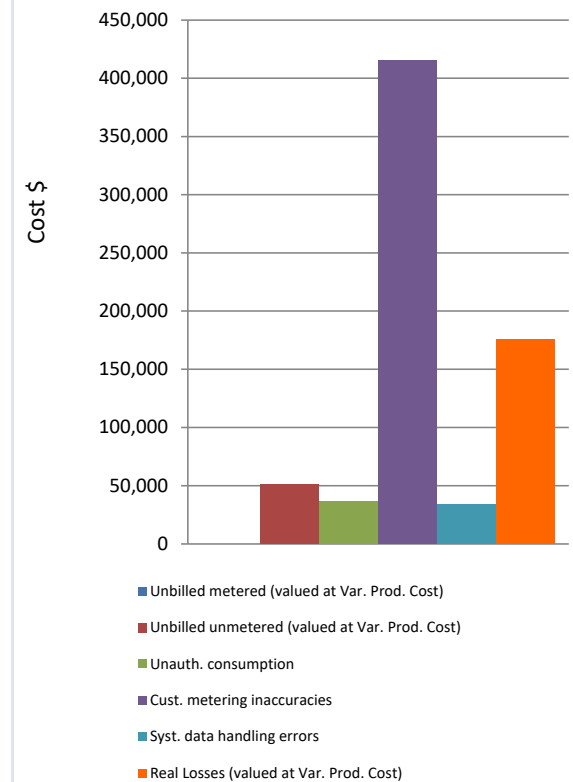
Data Validity Score: **59**

☐ Show me the VOLUME of Non-Revenue Water

☒ Show me the COST of Non-Revenue Water



Total Cost of NRW = \$713,361



Reporting Worksheet 1



AWWA Free Water Audit Software: System Attributes and Performance Indicators

WAS v5.0

American Water Works Association.
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Water Audit Report for: **Vernon Public Utilities (1910167)**

Reporting Year: **2019/2020** **7/2019 - 6/2020**

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 69 out of 100 ***

System Attributes:

Apparent Losses:	219.445	acre-ft/yr
+	Real Losses:	30.003 acre-ft/yr
=	Water Losses:	249.448 acre-ft/yr

? Unavoidable Annual Real Losses (UARL): **See limits in definition** acre-ft/yr

Annual cost of Apparent Losses: **\$211,254**

Annual cost of Real Losses: **\$22,234**

Valued at **Variable Production Cost**
Return to Reporting Worksheet to change this assumption

Performance Indicators:

Financial:

Non-revenue water as percent by volume of Water Supplied: **5.1%**

Non-revenue water as percent by cost of operating system: **3.5%** Real Losses valued at Variable Production Cost

Operational Efficiency:

Apparent Losses per service connection per day: **147.52** gallons/connection/day

Real Losses per service connection per day: **N/A** gallons/connection/day

Real Losses per length of main per day*: **525.19** gallons/mile/day

Real Losses per service connection per day per psi pressure: **N/A** gallons/connection/day/psi

From Above, Real Losses = Current Annual Real Losses (CARL): **30.00** acre-feet/year

? Infrastructure Leakage Index (ILI) [CARL/UARL]:

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline



AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.
Copyright © 2014, All Rights Reserved.Water Audit Report for: **Vernon Public Utilities (1910167)**Reporting Year: **2019/2020****7/2019 - 6/2020**Data Validity Score: **69**

Own Sources (Adjusted for known errors) 5,879.016	Water Exported 0.000	Billed Water Exported				
	Water Supplied 6,414.633	Authorized Consumption 6,165.185	Billed Authorized Consumption 6,085.002	Billed Metered Consumption (water exported is removed) 6,085.002	Revenue Water 6,085.002	
				Billed Unmetered Consumption 0.000		
			Unbilled Authorized Consumption 80.183	Unbilled Metered Consumption 0.000	Non-Revenue Water (NRW) 329.631	
				Unbilled Unmetered Consumption 80.183		
		Water Losses 249.448	Apparent Losses 219.445	Unauthorized Consumption 16.037		
				Customer Metering Inaccuracies 188.196		
				Systematic Data Handling Errors 15.213		
			Real Losses 30.003	Leakage on Transmission and/or Distribution Mains Not broken down		
	Leakage and Overflows at Utility's Storage Tanks Not broken down					
Leakage on Service Connections Not broken down						



AWWA Free Water Audit Software: Dashboard

WAS v5.0

American Water Works Association.
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The graphic below is a visual representation of the Water Balance with bar heights proportional to the volume of the audit components

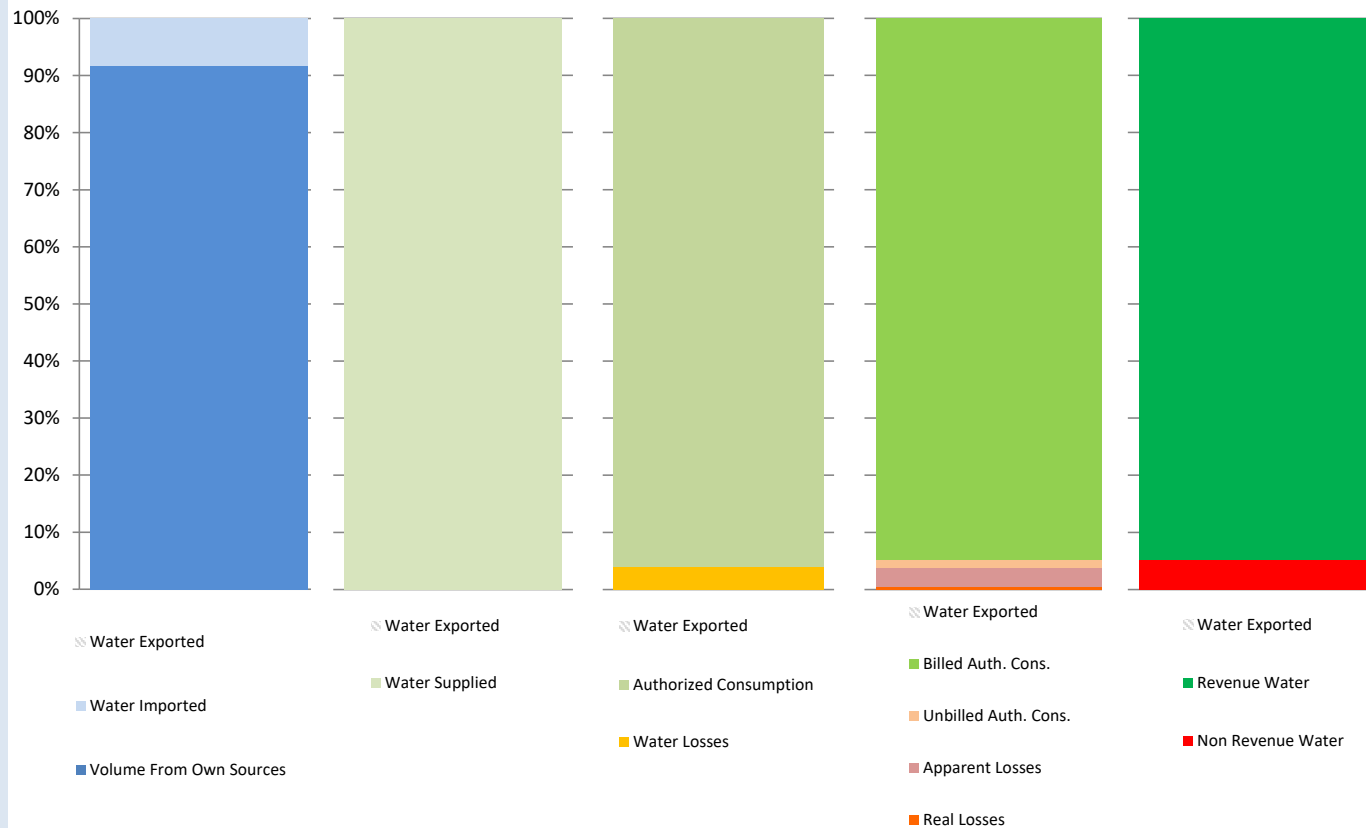
Water Audit Report for: **Vernon Public Utilities (1910167)**

Reporting Year: **2019/2020** **7/2019 - 6/2020**

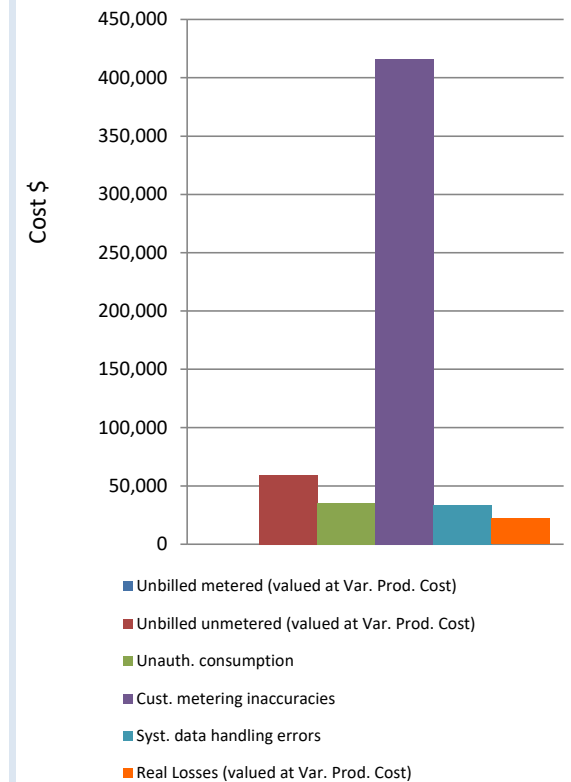
Data Validity Score: **69**

☐ Show me the VOLUME of Non-Revenue Water

☒ Show me the COST of Non-Revenue Water



Total Cost of NRW = \$566,628



Appendix K

Ordinance No. 995

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WHEREAS, the water supply conditions prevailing in the Vernon and in the area from which the City of Vernon a portion of its supply, requires (1) that the water s available to the City be put to the maximum possible ial use; (2) that waste, unreasonable use, or able method of use of City water be prevented; and (3) conservation of City water be practiced, all in the and general welfare of the people of the City of

WHEREAS, the Central Basin Municipal Water District ("Central Basin") has adopted Ordinance No. 1-91-16 requesting that the City of Vernon provide a mandatory conservation plan by March 31, 1991, in order to minimize the effect of a shortage of water supplies on the customers of the City of Vernon in case of a water shortage emergency; and

WHEREAS, said Central Basin Ordinance No. 1-91-16 will impose surcharges for excessive use of water by the City of Vernon and its customers and will grant credits for conservation measures which reduce water use below the staged percentages set forth therein; and

1 WHEREAS, due to the drought, the ordinary demands and
2 requirements of water consumers in the area may not be satisfied
3 without depleting the water supply to the extent that there
4 would be insufficient water for human consumption, sanitation
5 and fire protection due to the reduction in the water supply
6 from the Metropolitan Water District ("Metropolitan"); and

7 WHEREAS, Metropolitan has adopted certain phasing
8 programs of water conservation measures which may be implemented
9 depending upon the severity of the water shortage. Said water
10 conservation measures may restrict by penalties the amount of
11 water the City may receive from Metropolitan. Any reduction in
12 water supplies will require the City to implement water
13 conservation programs of its own; and

14 WHEREAS, the City must immediately adopt regulations
15 and encourage all residents and businesses within the City to
16 implement a drought water conservation program and, in case of a
17 water shortage, limit the amount of water which may be delivered
18 to customers to protect the health, welfare and safety of the
19 community; and

20 WHEREAS, if a drought water conservation program is
21 adopted, the water supply should be adequate to serve the
22 primary health and safety needs of the City; and

23 WHEREAS, the City of Vernon supplies potable water to
24 approximately 1090 businesses and households; and

25 WHEREAS, the City Council of the City of Vernon is
26 authorized to enact the provisions of this ordinance as an
27 urgency measure, upon its determination that such enactment is
28

1 necessary to protect the public welfare and safety; and

2 WHEREAS, there is an urgency in adopting this ordinance
3 in order to protect the water needs of the City of Vernon, for
4 the immediate preservation of the public peace, health, safety,
5 comfort, convenience and general welfare of the City of Vernon
6 and its inhabitants, employees, and businesses.

7 THE CITY COUNCIL OF THE CITY OF VERNON DOES ORDAIN AS
8 FOLLOWS:

9 SECTION 1: Findings.

10 The City Council of the City of Vernon hereby finds and
11 determines that the recitals contained hereinabove are true and
12 correct.

13 SECTION 2: Enactment.

14 Article VI of Chapter 25 of the Code of the City of
15 Vernon, "Water Conservation", is hereby enacted containing Code
16 Sections 25.100 through 25.111 to read as set forth in Appendix
17 A which is attached hereto and made a part hereof by reference.

18 SECTION 3: Urgency Ordinance.

19 This ordinance is hereby declared to be urgently
20 required for the immediate preservation of the public peace,
21 health, safety, comfort, convenience and general welfare of the
22 City of Vernon and its inhabitants, employees and businesses and
23 shall take effect immediately upon its adoption. The following
24 is a statement of the facts necessitating the urgency:

25 ///

26 ///

27 ///

1 (a) In order that the City of Vernon may immediately
2 provide for the conservation of water when water
3 supplies are being reduced and surcharges are
4 being imposed for excessive use;

5 (b) In order that the City of Vernon may conform to
6 Central Basin Ordinance No. 1-91-16 which requests
7 adoption of a water conservation ordinance by
8 March 31, 1991; and

9 (c) In order to protect the health, safety, and
10 general welfare of the City of Vernon and its
11 inhabitants.

12 SECTION 4: Violation.

13 Violation of this ordinance or any part thereof is
14 punishable by a fine of not more than One Thousand Dollars, or
15 by imprisonment in the County Jail for a period of not more than
16 six (6) months, or by both such fine and imprisonment. Each day
17 or any portion thereof during which any violation of any
18 provision of this ordinance is committed, continued or
19 permitted, constitutes a separate and individual offense.

20 SECTION 5: Conflicts.

21 Any ordinance or resolution or parts of ordinances in
22 conflict with this ordinance are hereby repealed.

23 SECTION 6: Severability.

24 If any section, subsection, sentence, clause, or phrase
25 or word of this ordinance is for any reason held to be void or
26 unconstitutional, such decision shall not affect the validity of
27 the remaining portions of this ordinance; it being the intention
28

1 of the City Council of the City of Vernon to adopt and pass this
2 ordinance and each section, subsection, sentence, clause or
3 phrase thereof irrespective of the fact that one or more of the
4 sections, subsections, clauses, sentences or phrases thereof may
5 be declared void or unconstitutional.

6 SECTION 7: Posting.

7 There being no newspaper printed, published or
8 circulated in the City of Vernon, the City Clerk is hereby
9 directed to certify to the passage of this ordinance and shall
10 post the same, or cause the same to be posted, within fifteen
11 (15) days after its passage in accordance with Section 36933 of
12 the Government Code, in three (3) of the most public places in
13 the City of Vernon, to wit: the northwest corner of 38th Street
14 and Santa Fe Avenue, the northeast corner of Leonis Boulevard
15 and Pacific Boulevard, and on the bulletin board in the lobby of
16 the City Hall of said City, located at 4305 Santa Fe Avenue, all
17 in the City of Vernon, County of Los Angeles, State of
18 California.

19 SECTION 8: Effective Date

20 This ordinance shall take effect immediately upon its
21 passage.

22 APPROVED AND ADOPTED this 19th day of March, 1991.

23
24 _____
LEONIS C. MALBURG, Mayor

25 ATTEST:

26 _____
27 BRUCE V. MALKENHORST, City Clerk
28

1 STATE OF CALIFORNIA)
2 COUNTY OF LOS ANGELES) ss

3 I, BRUCE V. MALKENHORST, City Clerk of the City of
4 Vernon, do hereby certify that the foregoing Ordinance, being
5 Ordinance No. 995, was duly and regularly introduced at a
6 regular meeting of the City Council of the City of Vernon, held
7 on Tuesday, March 19, 1991, and thereafter finally adopted at a
8 regular meeting of said City Council held on Tuesday,
9 March 19, 1991, and thereafter duly signed by the Mayor of the
10 City of Vernon, by the following vote:

11
12 AYES: Councilmen:

13
14 NOES: Councilmen:

15
16 ABSENT: Councilmen:

17
18 BRUCE V. MALKENHORST, City Clerk

19 (SEAL)
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Chapter 25. Water

ARTICLE VI

WATER CONSERVATION

Sec. 25.100. Purpose and Interpretation.

The purpose of this ordinance is to protect the health, safety and general welfare of the people by ensuring that water supplies will be conserved. To this end, minimum requirements are contained in this ordinance to protect the water supplies and to establish standards for reductions in the use of water in the City of Vernon.

(a) Meaning of Terms. Except as otherwise required by the context of this ordinance, the terms used in this ordinance shall have the same meaning as used elsewhere in this Chapter 25.

(b) Tense or Gender. Words used in the present tense include the future as well as the present. Words used in the masculine gender include the feminine and neuter. The singular number includes the plural, and the plural the singular.

(c) Section Headings. When contained in this ordinance, section headings shall not be deemed to govern, limit, modify, or in any manner effect the scope, meaning or intent of the provisions of any section.

Sec. 25.101. General Prohibition.

No customer of the City of Vernon shall make, cause, use or permit the use of City water in a manner contrary to any provision of this ordinance or in an amount which exceeds that

permitted pursuant to action taken by the City Council in accordance with the provisions of this ordinance.

Sec. 25.102. Determination of Water Shortage.

Whenever the City Council of the City of Vernon determines that an increase in water shortage has occurred and that corrective measures shall be undertaken pursuant to Phase I Shortage, Phase II Shortage, or Phase III Shortage, a notice thereof shall be posted in three (3) of the most public places in the City, to wit: the northwest corner of 38th Street and Santa Fe Avenue, the northeast corner of Leonis Boulevard and Pacific Boulevard, and on the bulletin board in the lobby of the City Hall of said City, located at 4305 Santa Fe Avenue, all in the City of Vernon, County of Los Angeles, State of California.

A copy of said notice shall be sent with each water bill. Any prohibitions or limitations on the use of water shall become effective thirty (30) days after such postings.

Sec. 25.103. Phase I Shortage.

A Phase I Shortage shall be declared when the City Council determines it is likely that the City of Vernon will suffer a shortage of more than ten percent (10%) and up to twenty percent (20%) in City water supplies.

The following restrictions on the use of water shall be in effect during a Phase I Shortage:

(a) There shall be no hose washing of sidewalks, walkways, driveways, parking areas or other paved surfaces, except as is required to alleviate immediate sanitation or health hazards.

(b) Washing of buildings, facilities, equipment, motor vehicles, trailers, boats and other types of mobile equipment shall be done with a hand-held bucket or a hose equipped with a positive shutoff nozzle for quick rinses; provided that no such waste shall be discharged in violation of Vernon City Code Section 21.19. Washing is permitted at any time on the immediate premises of a licensed commercial car or truck wash.

(c) No City water shall be used to clean, fill or maintain levels in decorative fountains, ponds, lakes or other similar aesthetic structures unless such water is part of a recycling system.

(d) No restaurant, hotel, cafe, cafeteria or other public place where food is sold, served or offered for sale, shall serve City water to any customer unless expressly requested.

(e) All customers of the City shall promptly repair all leaks from indoor and outdoor plumbing fixtures.

(f) Lawn, landscaped or other turf areas shall not be watered more often than every other day and shall not be watered between the hours of 10:00 a.m. and 4:00 p.m.; except that this provision shall not apply to commercial nurseries and other industries which depend upon such watering.

(g) No customer of the City shall cause or allow City water to run off landscaped areas into adjoining streets, sidewalks or other paved areas due to incorrectly directed or maintained sprinklers or excessive watering.

(h) City water from fire hydrants shall only be used for fire fighting, for the public health, safety, welfare and for construction activities as approved by the Director of Community Services. Flushing of water mains will not be permitted except as necessary to protect public health.

Sec 25.104. Phase II Shortage.

A Phase II Shortage shall be declared when the City Council determines it is likely that the City of Vernon will suffer a shortage of more than twenty percent (20%) and up to thirty percent (30%) in City water supplies.

The following restrictions on the use of City water shall be in effect during a Phase II Shortage:

(a) The restrictions listed in Sec. 25.103 shall be in effect, except that the restrictions on watering lawn, landscaped or other turf areas shall be modified to prohibit watering more often than every third day and shall be prohibited from watering between the hours of 6:00 a.m. and 6:00 p.m.

(b) Commercial nurseries and other water-dependent industries shall be prohibited from watering lawn, landscaped or other turf areas more often than every other day and shall be prohibited from watering between the hours of 10:00 a.m. and 4:00 p.m.

(c) No customer shall make, cause, use or permit the use of City water for any purpose in an amount in excess of eighty-five percent (85%) of the amount used on the customer's premises during the corresponding billing period during the 1989 calendar year.

1 Sec. 25.105. Phase III Shortage.

2 A Phase III Shortage shall be declared whenever the
3 City Council determines it is likely that the City of Vernon
4 will suffer a shortage of more than thirty percent (30%) in City
5 water supplies.

6 The following restrictions on the use of City water
7 shall be in effect during a Phase III Shortage:

8 (a) The restrictions listed in Sec. 25.103 and Sec.
9 25.104 shall be in effect, except that there shall be no outside
10 watering of lawn, landscaped or other turf areas at any time
11 except by bucket or other such container.

12 (b) Commercial nurseries and other water-dependent
13 industries shall be prohibited from watering lawn, landscaped
14 and other turf areas more often than every third day and shall
15 be prohibited from watering between the hours of 6:00 a.m. and
16 6:00 p.m.

17 (c) The use of water from fire hydrants shall be
18 limited to fire fighting and related activities. Other uses of
19 City water for municipal purposes shall be limited to activities
20 necessary to maintain the public health, safety and welfare.

21 (d) No customer shall make, cause, use or permit the
22 use of City water for any purpose in an amount in excess of
23 eighty percent (80%) of the amount used on the customer's
24 premises during the corresponding billing period of the 1989
25 calendar year.

26 ///

27 ///

1 Sec. 25.106. Relief from Compliance.

2 The Director of Community Services of the City of
3 Vernon shall develop such procedures as are necessary to process
4 applications for relief and shall, upon the filing by a customer
5 of an application for relief, take such steps as are reasonable
6 to resolve the application.

7 (a) A customer may file an application for relief
8 from any provision of this ordinance.

9 (b) The application for relief may include a request
10 that the customer be relieved, in whole or in part, from the
11 city water use curtailment provisions of Sec. 25.104(c) or
12 25.105(d).

13 (c) In determining whether to grant relief, and the
14 nature of any relief, all relevant factors shall be taken into
15 account including, but not limited to, the following:

16 (1) Whether any additional reduction in water
17 consumption will result in unemployment;

18 (2) Whether additional members have been added
19 to the household;

20 (3) Whether any additional landscaped property
21 has been added to the property since the corresponding billing
22 period of the prior calendar year;

23 (4) Whether changes in vacancy factors have
24 occurred;

25 (5) Whether the number of employees of the
26 customer have increased;

27 (6) Whether production has increased requiring
28

1 increased City water for processing;

2 (7) Whether new construction is taking place;

3 (8) Whether adjustments to City water use are
4 warranted because of emergency health or safety hazards; and

5 (9) Whether City water use is necessary for
6 reasons related to family illness or health.

7 (d) No relief shall be granted unless the customer
8 has achieved the maximum practical reduction in City water
9 consumption other than in the specific areas in which relief is
10 being sought. No relief shall be granted to any customer who,
11 when requested in writing by the Director of Community Services
12 fails to provide any information necessary for resolution of the
13 customer's application for relief.

14 (e) Notice of the determination of the Director of
15 Community Services shall be given in writing.

16 **Sec. 25.107. Failure to Comply.**

17 (a) For each violation by any customer of the water
18 use curtailment provision of Sec. 25.104(c), a surcharge shall
19 be imposed in an amount equal to fifty percent (50%) of the
20 portions of the water bill that exceeds the respective
21 percentages set in said section. For each violation by any
22 customer of the water use curtailment provision of Sec.
23 25.105(d), a surcharge shall be imposed in an amount equal to
24 100 percent (100%) of the portions of the water bill that
25 exceeds the respective percentages set in said section.

26 (b) Violation by any customer of any other water use
27 prohibitions of this ordinance shall be penalized as follows:

1 (1) First violation. A written notice of a
2 first violation shall be issued to the customer.

3 (2) Second violation. For a second violation
4 the City shall impose a surcharge in an amount equal to ten
5 percent (10%) of the customer's water bill.

6 (3) Third and subsequent violations. For a
7 third and each subsequent violation, the City may impose an
8 additional surcharge of ten percent (10%) for each such
9 violation and the City may install a flow restricting device on
10 the service of the customer at the premises at which the
11 violation occurred for a period determined by the Director of
12 Community Services. The City shall charge the customer the
13 reasonable costs incurred for installing and for removing the
14 flow-restricting device and for restoration of normal service.
15 The charge shall be paid before service can be restored.

16 (c) The City of Vernon shall give notice of violation
17 to the customer committing the violation in writing by certified
18 mail to the address as appears on the regular water bill.

19 The notice shall contain a description of the facts of
20 the violation, a statement of the possible penalties for each
21 violation and a statement informing the customer of his right to
22 a hearing on the merits of the violation pursuant to Sec.
23 25.108.

24 **Sec. 25.108. Hearing Regarding Violations.**

25 (a) Any customer receiving notice of a second or
26 subsequent violation of this ordinance shall have a right to a
27 hearing by the Director of Community Services of the City of
28

1 Vernon.

2 (b) Within thirty (30) days of mailing of the notice
3 of violation, the customer must file a timely written request
4 for a hearing with the Director of Community Services, which
5 request shall automatically stay installation of a flow-
6 restricting device on the customer's premises until a decision
7 has been rendered.

8 (c) The customer's request for a hearing shall not
9 stay the imposition of a surcharge. The customer shall deposit
10 with the City of Vernon money in the amount of any surcharge
11 due. If it is determined that the surcharge was wrongly
12 assessed, the City of Vernon will refund any money deposited to
13 the customer.

14 (d) Notice of the decision of the Director of
15 Community Services shall be given in writing.

16 **Sec. 25.109. Appeal.**

17 Any determination or decision by the Director of
18 Community Services may be appealed to the City Council. Such
19 appeal shall be filed within thirty (30) days of said
20 determination or decision. The decision of the City Council
21 shall be final.

22 **Sec. 25.110. Determination of Phase I, II, and III Shortage.**

23 The City Council may make a determination of Phase I,
24 II, or III Shortage and the need to implement conservation
25 measures as set forth in this ordinance by resolution. The
26 Director of Community Services shall file a report and
27 documentation supporting the need for such a determination with
28

1 the City Council. If the City Council makes a determination,
2 its resolution shall set forth the findings which support such
3 determination.

4 **Sec. 25.111. Public Health and Safety Not to be Affected.**

5 Nothing in this ordinance shall be construed to
6 require the City of Vernon to curtail the supply of water to any
7 customer when such water is required by that customer to
8 maintain an adequate level of public health and safety.

Appendix L

Ordinance No. 1115

ORDINANCE NO. 1115

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF
VERNON AMENDING SECTIONS 25.102, 25.103(b),
25.104(c) AND 25.105(d) OF ARTICLE VI TO CHAPTER 25
OF THE CODE OF THE CITY OF VERNON, CALIFORNIA,
1959, RELATING TO WATER CONSERVATION RESTRICTIONS

WHEREAS, the City of Vernon (the "City") is a municipal
corporation and a chartered city of the State of California organized
and existing under its Charter and the Constitution of the State of
California; and

WHEREAS, by adoption of Ordinance No. 995 on March 19, 1991,
the City Council of the City enacted water conservation restrictions,
which are codified in Article VI of Chapter 25 of the Vernon City Code;
and

WHEREAS, on December 7, 2005, the City Council of the City
adopted Resolution No. 8914 adopting an Urban Water Management Plan for
2005-2009; and

WHEREAS, Vernon City Code Sections 25.104(c) and 25.105(d)
base water consumption data on the customer's premises during the
corresponding billing period during the 1989 calendar year and such
water consumption and customers have dramatically varied since 1989 and
data from this time is no longer available; and

WHEREAS, the Director of Community Services & Water has
recommended that the City base its drought restrictions on readily
available current information that more closely reflects the water
consumption of the community prior to the drought and that Sections
25.104(c) and 25.105(d) of Chapter 25 of the Vernon City Code be
amended to restrict a customer's water usage to 85% or 80% of the

1 amount of water used for the corresponding billing period two years
2 preceding the City declaring a water shortage; and

3 WHEREAS, Sections 25.102 and 25.103(b) of Article VI of
4 Chapter 25 of the Vernon City Code contain references to items that
5 that have been renumbered or repealed that need to be corrected; and

6 WHEREAS, the City Council finds and determines that it is in
7 the interests of the public health, safety and welfare to implement the
8 recommendations of the Director of Community Services and Water and to
9 update certain code sections, as set forth in this Ordinance; and

10 WHEREAS, Chapter 4.1(f) and (h) of the Charter of the City of
11 Vernon provides that an ordinance shall amend a code or repeal any
12 ordinance or code previously adopted.

13 THE CITY COUNCIL OF THE CITY OF VERNON HEREBY ORDAINS:

14 SECTION 1: The City Council of the City of Vernon hereby
15 finds and determines that the recitals contained hereinabove are true
16 and correct.

17 SECTION 2: The City Council of the City of Vernon hereby
18 amends Section 25.102 of Article VI of Chapter 25, Water Conservation,
19 of the Vernon City Code to read as follows:

20 **Sec. 25.102. Determination of Water Shortage.**

21 Whenever the city council of the City of Vernon
22 determines that an increase in water shortage has
23 occurred and that corrective measures shall be
24 undertaken pursuant to Phase I Shortage, Phase II
25 Shortage, or Phase III Shortage, a notice thereof
26 shall be posted in three (3) of the most public
27 places in the City, to wit: the northwest corner
28 of 38th Street and Santa Fe Avenue, the northeast

1 corner of Leonis Boulevard and Pacific Boulevard,
2 and on the bulletin board located outside on the
3 wall near the second floor entrance to the City
4 Hall of said City, located at 4305 Santa Fe Avenue,
5 all in the City of Vernon, County of Los Angeles,
6 State of California.

7 A copy of said notice shall be sent with each water
8 bill. Any prohibitions or limitations on the use
9 of water shall become effective thirty (30) days
10 after such postings.

11 SECTION 3: The City Council of the City of Vernon hereby
12 amends Section 25.103(b) of Article VI of Chapter 25, Water
13 Conservation, of the Vernon City Code to read as follows. The balance
14 of Section 25.103 shall remain unchanged.

15 **Sec. 25-103. Phase I Shortage.**

16 * * *

17 (b) Washing of buildings, facilities, equipment,
18 motor vehicles, trailers, boats and other types of
19 mobile equipment shall be done with a hand-held
20 bucket or a hose equipped with a positive shutoff
21 nozzle for quick rinses; provided that no such
22 waste shall be discharged in violation of Vernon
23 City Code section 21.5.1. Washing is permitted at
24 any time on the immediate premises of a licensed
25 commercial car or truck wash.

26 SECTION 4: The City Council of the City of Vernon hereby
27 amends Section 25.104(c) of Article VI of Chapter 25, Water
28 Conservation, of the Vernon City Code to read as follows. The balance

1 of Section 25.104 shall remain unchanged.

2 **Sec. 25-104. Phase II Shortage.**

3 * * *

4 (c) No customer shall make, cause, use or permit
5 the use of city water for any purpose in excess of
6 eighty-five percent (85%) of the amount used for
7 the same corresponding monthly billing permit two
8 (2) years preceding the city council declaring a
9 Phase II water shortage.

10 SECTION 5: The City Council of the City of Vernon hereby
11 amends Section 25.105(d) of Article VI of Chapter 25, Water
12 Conservation, of the Vernon City Code to read as follows. The balance
13 of Section 25.105 shall remain unchanged.

14 **Sec. 25-105. Phase III Shortage.**

15 * * *

16 (d) No customer shall make, cause, use or permit
17 the use of city water for any purpose in excess of
18 eighty percent (80%) of the amount used for the same
19 corresponding monthly billing period two (2) years
20 preceding the city council declaring a Phase III
21 water shortage.

22 SECTION 6: There being no newspaper printed, published or
23 circulated in the City of Vernon, the City Clerk is hereby directed to
24 certify to the passage of this Ordinance and shall post the same, or
25 cause the same to be posted, within fifteen (15) days after its passage
26 in accordance with Section 36933 of the Government Code, in three (3)
27 of the most public places in the City of Vernon, to wit: the northwest
28 corner of 38th Street and Santa Fe Avenue, the northeast corner of

1 Leonis Boulevard and Pacific Boulevard, and on the bulletin board
2 located outside on the wall near the second floor entrance to the City
3 Hall of said City, located at 4305 Santa Fe Avenue, all in the City of
4 Vernon, County of Los Angeles, State of California.

5 SECTION 7: If any section, subsection, subdivision,
6 paragraph, sentence, clause, phrase or word of this Ordinance or any
7 part thereof is for any reason held to be void or unconstitutional or
8 invalid or ineffective by a court of competent jurisdiction, such
9 decision shall not affect the validity or effectiveness of the
10 remaining portions of this Ordinance or any part thereof; it being the
11 intention of the City Council of the City of Vernon to have passed and
12 adopted this Ordinance and each section, subsection, subdivision,
13 paragraph, sentence, clause or phrase thereof irrespective of the fact
14 that one or more of the sections, subsections, subdivisions,
15 paragraphs, sentences, clauses or phrases thereof may be
16 declared to be unconstitutional or invalid or ineffective.

17 SECTION 8: Any ordinance, part of an ordinance, or code
18 section in conflict with this Ordinance is hereby repealed.

19 SECTION 9: Violation of this ordinance or any part thereof
20 is punishable by a fine of not more than One Thousand Dollars, or by
21 imprisonment in the County Jail for a period of not more than six (6)
22 months, or by both such fine and imprisonment. Each day or any portion
23 thereof during which any violation of any provision of this ordinance
24 is committed, continued or permitted, constitutes a separate and
25 individual offense.

26 / / /

27 / / /

28 / / /

SECTION 10: This Ordinance shall be in full force and effect thirty (30) days from and after its passage of the same.

APPROVED AND ADOPTED this _____ day of May, 2006.

S/ LEONIS C. MALBURG

LEONIS C. MALBURG, Mayor

ATTEST:

S/BRUCE V. MALKENHORST, JR.

BRUCE V. MALKENHORST, JR.
Acting City Clerk

1 STATE OF CALIFORNIA)
2) ss
3 COUNTY OF LOS ANGELES)

4 I, BRUCE V. MALKENHORST, JR., Acting City Clerk of the City of
5 Vernon, do hereby certify that the foregoing Ordinance, being Ordinance
6 No. 1115 was duly and regularly introduced at an adjourned regular
7 meeting of the City Council of the City of Vernon, held on Wednesday,
8 May 3, 2006, and thereafter finally adopted at a regular meeting of the
9 City Council held on Wednesday, May 24, 2006, and thereafter was duly
10 signed by the Mayor of the City of Vernon, by the following vote:

11
12 AYES: Councilmen: Mayor Malburg, Ybarra, Davis,
13 Gonzales, McCormick

14 NOES: Councilmen: None

15 ABSTAINED: Councilmen: None

16 ABSENT: Councilmen: None

17 **S/BRUCE V. MALKENHORST, JR.**

18 _____
19 BRUCE V. MALKENHORST, JR.
20 Acting City Clerk

21 (SEAL)
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Appendix M

Ordinance No. 1161

ORDINANCE NO. 1161

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF VERNON AMENDING THE CODE OF THE CITY OF VERNON, CALIFORNIA, 1959 BY AMENDING SECTIONS 25.100, 25.101, 25.102, 25.103, 25.104, 25.105, 25.106(b), 25.107(a); ADDING A NEW SECTION 25.112; ADOPTING BY REFERENCE THE DEPARTMENT OF WATER RESOURCES STATE MODEL LANDSCAPING ORDINANCE; AND REPEALING ALL ORDINANCES OR PARTS OF ORDINANCES IN CONFLICT THEREWITH

WHEREAS, the City of Vernon (the "City") is a municipal corporation and a chartered city of the State of California organized and existing under its Charter and the Constitution of the State of California; and

WHEREAS, due to drought and other environmental conditions the establishment of water conservation measures to assure reasonable and beneficial use of water, to prevent waste of water and maximize the efficient use of water is appropriate; and

WHEREAS, by adoption of Ordinance No. 995 on March 19, 1991 and Ordinance No. 1115 on May 24, 2006, the City Council of the City enacted water conservation restrictions, which are codified in Article VI of Chapter 25 of the Vernon City Code; and

WHEREAS, the Metropolitan Water District (MWD) Board of Directors adopted a policy requiring cities to have a water conservation ordinance, as a prerequisite for funding through the Public Sector Program and the Enhanced Conservation Program; and

WHEREAS, the MWD policy also applies to any future state or federal funding opportunities; and

WHEREAS, in order to qualify under the new MWD policy, a water conservation ordinance must include the prohibition of certain

1 outdoor water uses by residences and business, including: regulating
2 outdoor irrigation practices, penalties for violation and a public
3 communications mechanism to allow customers to report any perceived
4 water wasting violations; and

5 WHEREAS, the Department of Water Resources (DWR), based on
6 legislative directives, is requiring cities to adopt a model water
7 efficient landscape ordinance, or its equivalent, by January 1, 2010,
8 which allows a city to adopt an ordinance developed by another agency
9 that has received certification compliance from the DWR; and

10 WHEREAS, if a city opts not to take any action in terms of
11 developing a water conservation ordinance, the DWR model ordinance
12 shall be adopted by statute on January 1, 2010; and

13 WHEREAS, Section 4.5 of the Charter of the City of Vernon
14 provides that regulations pertaining to any subject, model codes, and
15 codifications of ordinances of other public agencies may be adopted
16 by reference, in their original form or with amendments, with the
17 same effect as an ordinance; and

18 WHEREAS, the Director of Community Services & Water has
19 reviewed the Vernon City Code and has recommended that the City (i)
20 adopt by reference the Model Water Efficient Landscape Ordinance of
21 the Department of Water Resources that will become effective
22 January 1, 2010 by adding a new Section 25.112 to the Vernon City
23 Code, and (ii) amend Sections 25.100, 25.101, 25.102, 25.103, 25.104,
24 25.105, 25.106(b) and 25.107(a) of the Vernon City Code in order to
25 meet the requirements of the MWD and DWR model ordinances; and

26 WHEREAS, the City Council on October 19, 2009, gave a first
27 reading to this Ordinance and the title of said code and standards,
28 and gave a second reading on October 26, 2009, for the purpose of

1 considering the adoption of the Model Water Efficient Landscape
2 Ordinance of the Department of Water Resources in its entirety
3 effective January 1, 2010; and

4 WHEREAS, the Director of Community Services & Water has
5 recommended that the City Council make a finding that the adoption of
6 this ordinance is exempt pursuant to Guideline 15061(b)(3) and
7 Guideline 15308 from the California Environmental Quality Act because
8 the adoption of this ordinance will not have a significant effect on
9 the environment as it has the effect of limiting rather than
10 authorizing the use of water supplies and resources, and also
11 constitutes an action by the City to assure the maintenance,
12 enhancement, and protection of the environment through the
13 conservation of water resources; and

14 WHEREAS, the City Council finds and determines that it is
15 in the interests of the public health, safety and welfare of the City
16 of Vernon, its residents, businesses and employees to implement the
17 recommendations of the Director of Community Services and Water, as
18 set forth in this Ordinance.

19 THE CITY COUNCIL OF THE CITY OF VERNON HEREBY ORDAINS:

20 SECTION 1: The City Council of the City of Vernon hereby
21 finds and determines that the recitals contained hereinabove are true
22 and correct.

23 SECTION 2: The City Council of the City of Vernon hereby
24 amends Chapter 25, Water, Article VI, Water Conservation, of the
25 Vernon City Code, by adding Section 25.112 and amending Sections
26 25.100 to 25.105, 25.106(b) and 25.107(a) of said Code as set forth
27 in Exhibit A which is attached hereto and incorporated by reference.

28 SECTION 3: The City Council of the City of Vernon hereby

1 adopts by reference the Model Water Efficient Landscape Ordinance of
2 the Department of Water Resources (the "Model Ordinance") as set
3 forth in Exhibit B which is attached hereto and incorporated by
4 reference. Three (3) copies of the Model Ordinance so adopted shall
5 be filed and kept on file for use and examination by the public in
6 the office of the City Clerk.

7 SECTION 4: Pursuant to the California Environmental
8 Quality Act (Public Resources Code Section 21000 et seq.) ("CEQA")
9 and the State CEQA Guidelines (California Code of Regulations, Title
10 14, Section 15000 et seq.), the City Council of the City of Vernon
11 hereby finds that it can be seen with certainty that there is no
12 possibility that the adoption of this Ordinance will have a
13 significant effect on the environment because it has the effect of
14 limiting rather than authorizing the use of water supplies and
15 resources, and constitutes an action by the City to assure the
16 maintenance, enhancement, and protection of the environment through
17 the conservation of water resources. Therefore, the adoption of this
18 Ordinance is exempt from CEQA pursuant to State CEQA Guidelines
19 Sections 15061(b) (3) and 15308.

20 SECTION 5: Any ordinance or parts of ordinances in
21 conflict with this Ordinance are hereby repealed.

22 SECTION 6: Severability. If any chapter, article,
23 section, subsection, subdivision, paragraph, sentence, clause,
24 phrase, or word in this Ordinance or any part thereof is for any
25 reason held to be unconstitutional or invalid or ineffective by any
26 court of competent jurisdiction, such decision shall not affect the
27 validity or effectiveness of the remaining portions of this Ordinance
28 or any part thereof. The City Council hereby declares that it would

have adopted this Ordinance and each chapter, article, section, subsection, subdivision, paragraph, sentence, clause or phrase thereof, irrespective of the fact that any one or more chapters, articles, sections, subsections, subdivisions, paragraphs, sentences, clauses, phrases or words be declared unconstitutional, or invalid, or ineffective.

SECTION 7: Book of Ordinances. The City Clerk shall attest and certify to the adoption of this Ordinance and shall cause this Ordinance and the City Clerk's certification to be entered in the Book of Ordinances of the Council of this City. The City Clerk shall cause this ordinance to be published or posted as required by law.

SECTION 8: Effective Date. This Ordinance shall go into effect and be in full force and effect at 12:01 a.m. on the thirty-first (31st) day after its passage.

APPROVED AND ADOPTED this 26th day of October 2009.

Wilmar Gonzales

Name :

Title: Mayor / Mayor Pro-Tem

ATTEST:

Manuela Giron
MANUELA GIRON, City Clerk

1 STATE OF CALIFORNIA)
2) ss
3 COUNTY OF LOS ANGELES)

4 I, MANUELA GIRON, City Clerk of the City of Vernon, do hereby
5 certify that the foregoing Ordinance, being Ordinance No. 1161, was
6 duly and regularly introduced at a meeting of the City Council of the
7 City of Vernon, held on Monday, October 19, 2009, and thereafter
8 adopted at a meeting of said City Council held on Monday, October 26,
9 2009, by the following vote:

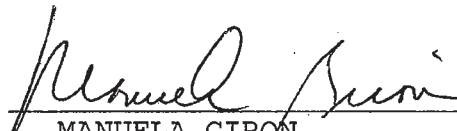
10
11 AYES: Councilmembers: Mayor Gonzales, McCormick,
12 Davis, Maisano, Newmire

13 NOES: Councilmembers: None

14 ABSENT: Councilmembers: None

15 And thereafter was duly signed by the Mayor or Mayor Pro-Tem
16 of the City of Vernon.

17 Executed this 27th day of October, 2009, at Vernon,
18 California.

19
20
21 
22 MANUELA GIRON
City Clerk

23 (SEAL)
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1 by commercial nurseries and commercial growers to sustain plants,
2 trees, shrubs, crops or other vegetation intended for commercial
3 sale.

4 This article is intended solely to further the conservation of
5 water. It is not intended to implement any provision of federal,
6 state, or local statutes, ordinances, or regulations relating to
7 protection of water quality or control of drainage or runoff.

8 The following words and phrases whenever used in this article
9 have the meaning defined in this section:

10 (a) **Billing unit** means the unit of water used to apply water
11 rates for purposes of calculating water charges for a person's water
12 usage and equals one hundred cubic feet (Ccf).

13 (b) **Landscape irrigation system** means an irrigation system with
14 pipes, hoses, spray heads, or sprinkling devices that are operated by
15 hand or through an automated system.

16 (c) **Person** means any natural person or persons, corporation,
17 public or private entity, governmental agency or institution,
18 including all agencies and departments of city, or any other user of
19 water provided by the city.

20 (d) **Potable water** means water which is suitable for drinking.

21 (e) **Recycled water** means the reclamation and reuse of non-
22 potable water for beneficial use as defined in Title 22 of the
23 California Code of Regulations.

24 (f) **Section Headings** means, when contained in this article, that
25 section headings shall not be deemed to govern, limit, modify, or in
26 any manner effect the scope, meaning or intent of the provisions of
27 any section.

28 ///

1 (g) **Single pass cooling systems** means equipment where water is
2 circulated only once to cool equipment before being disposed.

3 (h) **Tense or Gender** means words used in the present tense
4 include the future as well as the present. Words used in the
5 masculine gender include the feminine and neuter. The singular number
6 includes the plural, and the plural the singular.

7 **Sec. 25.101. General prohibition.**

8 No customer of the City of Vernon shall make, cause, use or
9 permit the use of city water in a manner contrary to any provision of
10 this article or in an amount which exceeds that permitted pursuant to
11 action taken by the city council in accordance with the provisions of
12 this article.

13 In addition, the following water conservation requirements are
14 effective at all times and are permanent. Violations of this section
15 will be considered waste and an unreasonable use of water.

16 (a) **Limits on Watering Hours:** Watering or irrigating of lawn,
17 landscape or other vegetated area with potable water is prohibited
18 between the hours of 10:00 a.m. and 5:00 p.m. on any day, except by
19 use of a hand-held bucket or similar container, a hand-held hose
20 equipped with a positive self-closing water shut-off nozzle or
21 device, or for very short periods of time for the express purpose of
22 adjusting or repairing an irrigation system.

23 (b) **Limit on Watering Duration:** Watering or irrigating of lawn,
24 landscape or other vegetated area with potable water using a
25 landscape irrigation system or a watering device that is not
26 continuously attended is limited to no more than fifteen (15) minutes
27 watering per day per station. This subsection does not apply to
28 landscape irrigation systems that exclusively use very low-flow drip

1 type irrigation systems when no emitter produces more than two (2)
2 gallons of water per hour and weather based controllers or stream
3 rotor sprinklers that meet a seventy percent (70%) efficiency
4 standard.

5 **(c) No Excessive Water Flow or Runoff:** Watering or irrigating
6 of any lawn, landscape or other vegetated area in a manner that
7 causes or allows excessive water flow or runoff onto an adjoining
8 sidewalk, driveway, street, alley, gutter or ditch is prohibited.

9 **(d) No Washing Down Hard or Paved Surfaces:** Washing down hard
10 or exterior paved surfaces, including but not limited to sidewalks,
11 walkways, driveways, parking areas, patios or alleys, is prohibited
12 except when necessary to alleviate safety or sanitary hazards, and
13 then only by use of a hand-held bucket or similar container, a hand-
14 held hose equipped with a positive self-closing water shut-off
15 device, a low-volume, high-pressure cleaning machine equipped to
16 recycle any water used, or a low-volume high-pressure water broom.

17 **(e) Obligation to Fix Leaks, Breaks or Malfunctions:** Excessive
18 use, loss or escape of water through breaks, leaks or other
19 malfunctions in the water user's plumbing or distribution system for
20 any period of time after such escape of water should have reasonably
21 been discovered is prohibited and shall be repaired as soon as
22 reasonably practicable.

23 **(f) Re-circulating Water Required for Water Fountains and**
24 **Decorative Water Features:** Operating a water fountain or other
25 decorative water feature that does not use re-circulated water is
26 prohibited.

27 **(g) Limits on Washing Vehicles:** Using water to wash or clean a
28 vehicle, including but not limited to any automobile, truck, van,

1 bus, motorcycle, boat or trailer, whether motorized or not is
2 prohibited, except by use of a hand-held bucket or similar container
3 or a hand-held hose equipped with a positive self-closing water shut-
4 off nozzle or device. This subsection does not apply to any
5 commercial vehicle washing facility.

6 **(h) Drinking Water Served Upon Request Only:** Eating or drinking
7 establishments, including but not limited to a restaurant, hotel,
8 cafe, cafeteria, bar, or other public place where food or drinks are
9 sold, served, or offered for sale, are prohibited from providing
10 drinking water to any person unless expressly requested.

11 **(i) No Installation of Single Pass Cooling Systems:**
12 Installation of single pass cooling systems is prohibited in
13 buildings requesting new water service.

14 **(j) Limits on Commercial Car Wash and Laundry Systems:**
15 Installation of non-re-circulating water systems is prohibited in new
16 commercial conveyor car wash and new commercial laundry systems.

17 **Sec. 25.102. Determination of Water Supply Shortage.**

18 The City of Vernon, in its sole discretion, may determine that
19 due to drought or other water supply conditions, a water supply
20 shortage or threatened shortage exists and a consumer demand
21 reduction is necessary to make more efficient use of water and
22 appropriately respond to existing water conditions and that
23 corrective measures shall be undertaken pursuant to a Phase I, Phase
24 II or a Phase III Water Supply Shortage. When the City determines a
25 water supply shortage exists, a notice thereof shall be published in
26 a newspaper of general circulation and a copy of said notice shall be
27 sent with each water bill or by any other mailing to the address to
28 which the City customarily mails the billing statement for fees for

1 water service. Any prohibitions or limitations on the use of water,
2 beyond those established in Section 25.101, shall become effective
3 thirty (30) days after such mailing or on such a date as specified in
4 the notice.

5 **Sec. 25.103. Phase I Water Supply Shortage.**

6 A Phase I water supply shortage may be declared when the City
7 Council determines it is likely that the City of Vernon will suffer a
8 shortage in City water supplies up to 20%, but shall become mandatory
9 when the City Council determines that the City will suffer a water
10 shortage in excess of 20% of its normal water supplies.

11 In addition to the prohibited uses of water identified in
12 Section 25.101, the following water conservation requirements apply
13 during a declared Phase I Water Supply Shortage:

14 (a) **Limits on Watering Days:** Watering or irrigating of lawn,
15 landscape or other vegetated area with potable water is limited to
16 three (3) days per week on a schedule established and posted by the
17 City. Watering or irrigating of lawn, landscape or other vegetated
18 area with potable water is prohibited between the hours of 6:00 a.m.
19 and 6:00 p.m. Pacific Standard Time. This provision does not apply
20 to landscape irrigation zones that exclusively use very low flow drip
21 type irrigation systems when no emitter produces more than two (2)
22 gallons of water per hour. This provision also does not apply to
23 watering or irrigating by use of a hand-held bucket or similar
24 container, a hand-held hose equipped with a positive self-closing
25 water shut-off nozzle or device, or for very short periods of time
26 for the express purpose of adjusting or repairing an irrigation
27 system.

1 (b) **Obligation to Fix Leaks, Breaks or Malfunctions:** All
2 leaks, breaks, or other malfunctions in the water user's plumbing or
3 distribution system must be repaired within seventy-two (72) hours of
4 notification by the city unless other arrangements are made with the
5 city.

6 **Sec. 25.104. Phase II Water Supply Shortage.**

7 A Phase II Water Supply Shortage exists when the City Council
8 determines, in its sole discretion, that due to drought or other
9 water supply conditions, a water supply shortage or threatened
10 shortage exists and a consumer demand reduction is necessary to make
11 more efficient use of water and appropriately respond to existing
12 water conditions, except that a phase II Water Supply Shortage shall
13 become mandatory when the City Council determines that the City will
14 suffer a water shortage in excess of 30% of its normal water
15 supplies. Upon the declaration by the city of a Phase II Water Supply
16 Shortage condition, the city will implement the mandatory Phase II
17 conservation measures identified in this section.

18 In addition to the prohibited uses of water identified in
19 Sections 25.101 and 25.103, the following additional water
20 conservation requirements apply during a declared Level II Water
21 Supply Shortage:

22 (a) **Watering Days:** Watering or irrigating of lawn, landscape
23 or other vegetated area with potable water is limited to two (2) days
24 per week on a schedule established and posted by the city. During the
25 months of November through March, watering or irrigating of lawn,
26 landscape or other vegetated area with potable water is limited to no
27 more than one (1) day per week on a schedule established and posted
28 by the city. This provision does not apply to landscape irrigation

1 zones that exclusively use very low flow drip type irrigation systems
2 when no emitter produces more than two (2) gallons of water per hour.
3 This provision also does not apply to watering or irrigating by use
4 of a hand-held bucket or similar container, a hand-held hose equipped
5 with a positive self-closing water shut-off nozzle or device, or for
6 very short periods of time for the express purpose of adjusting or
7 repairing an irrigation system.

8 **(b) Obligation to Fix Leaks, Breaks or Malfunctions:** All leaks,
9 breaks, or other malfunctions in the water user's plumbing or
10 distribution system must be repaired within forty-eight (48) hours of
11 notification by the city unless other arrangements are made with the
12 city.

13 **(c) Limits on Filling Ornamental Lakes or Ponds:** Filling or re-
14 filling ornamental lakes or ponds is prohibited, except to the extent
15 needed to sustain aquatic life, provided that such animals are of
16 significant value and have been actively managed within the water
17 feature prior to declaration of a supply shortage level under this
18 article.

19 **(d) Limits on Washing Vehicles:** Using water to wash or clean a
20 vehicle, including but not limited to, any automobile, truck, van,
21 bus, motorcycle, boat or trailer, whether motorized or not, is
22 prohibited except by use of a hand-held bucket or similar container,
23 a hand-held hose equipped with a positive self-closing water shut-of
24 nozzle or device, by high pressure/low volume wash systems, or at a
25 commercial car washing facility that utilizes a re-circulating water
26 system to capture or reuse water.

27 **(e) Limits on Filling Residential Swimming Pools & Spas:** Re-
28 filling of more than one (1) foot and initial filling of residential

1 swimming pools or outdoor spas with potable water is prohibited.

2 **(f) Commercial Nurseries Watering Limitations:** Commercial
3 Nurseries shall be prohibited from watering lawn, landscaped or other
4 turf areas more often than every other day and shall be prohibited
5 from watering between the hours of 10:00 a.m. and 4:00 p.m.

6 **(g) Mandatory Water Restrictions:** No customer shall make,
7 cause, use or permit the use of city water for any purpose in excess
8 of eighty-five percent (85%) of the amount used the same
9 corresponding monthly billing period two (2) years preceding the city
10 council declaring a Phase I Water Supply Shortage. In the case of a
11 newly established business, no restriction shall be required until
12 such time that the business has been established for one (1) year, at
13 which time the preceding year's corresponding monthly billing shall
14 be used to determine the businesses monthly water consumption.

15 **Sec. 25.105. Phase III Water Supply Shortage - Emergency Condition.**

16 A Phase III Water Supply Shortage condition is also referred to
17 as an "Emergency" condition. A Phase III condition exists when the
18 City of Vernon declares a water shortage emergency or when the City
19 Council determines that the City will suffer a shortage of more than
20 50% of its normal water supplies. Upon the declaration of a Phase
21 III Water Supply Shortage condition, the City shall notify its
22 residents and businesses that a significant reduction in consumer
23 demand is necessary to maintain sufficient water supplies for public
24 health and safety and shall implement the mandatory Phase III
25 conservation measures identified in this section.

26 In addition to the prohibited uses of water identified in
27 Sections 25.101, 25.103 and 25.104, the following water conservation
28 requirements apply during a declared Phase III Water Supply Shortage

Emergency:

(a) **No Watering or Irrigating:** Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited. This restriction does not apply to the following categories of use, unless the city has determined that recycled water is available and may be applied to the use:

(1) Maintenance of vegetation, including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self-closing water shut-off nozzle or device;

(2) Maintenance of existing landscape necessary for fire protection;

(3) Maintenance of existing landscape for soil erosion control;

(4) Maintenance of plant materials identified to be rare or essential to the well-being of protected species;

(5) Maintenance of landscape within active public playing fields and school grounds, provided that such irrigation does not exceed two (2) days per week according to the schedule established in Section 25.104(a) and the time restrictions as established in section 25.103(a);

(6) Actively irrigated environmental mitigation projects.

(b) **Obligation to Fix Leaks, Breaks or Malfunctions:** All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within twenty four (24) hours of notification by the city unless other arrangements are made with the city.

(c) **Commercial Nurseries Watering Limitations:** Commercial

1 Nurseries shall be prohibited from watering lawn, landscaped or other
2 turf areas more often than every third (3rd) day and shall be
3 prohibited from watering between the hours of 6:00 a.m. and 6:00 p.m.

4 **(d) Mandatory Water Restrictions:** No customer shall make,
5 cause, use or permit the use of city water for any purpose in excess
6 of seventy-five percent (75%) of the amount used the same
7 corresponding monthly billing period two (2) years preceding the city
8 council declaring a Phase I Water Supply Shortage. In the case of a
9 newly established business, no restriction shall be required until
10 such time that the business has been established for one (1) year, at
11 which time the preceding year's corresponding monthly billing period
12 shall be used to determine the businesses monthly water consumption.

13 **(e) Fire Hydrant Use:** The use of water from a fire hydrant
14 shall be limited to fire fighting and related activities. Other uses
15 of city water for municipal purposes shall be limited to activities
16 necessary to maintain the public health, safety and welfare.

17 **(f) Customer Water Conservation Report:** The city may, by
18 written request, require all commercial and industrial customers
19 using 100 acre feet or more per year of potable water to submit a
20 water conservation plan and quarterly progress reports on such plan.
21 The conservation plan shall include recommendations for increased
22 water savings, including increased water recycling based on
23 feasibility. The quarterly report shall include progress to date on
24 implementation of such recommendations.

25 **Sec. 25.106. Relief from compliance.**

26 * * *

1 (b) The application for relief may include a request that the
2 customer be relieved, in whole or in part, from the city water use
3 curtailment provisions of Sec. 25.104(g) or 25.105(d).

4 * * *

5 **Sec. 25.107. Failure to comply.**

6 (a) For each violation by any customer of the water use
7 curtailment provision of Sec. 25.104(g), a surcharge shall be imposed
8 in an amount equal to fifty percent (50%) of the portions of the
9 water bill that exceeds the respective percentages set in said
10 section. For each violation by any customer of the water use
11 curtailment provision of Sec. 25.105(d), a surcharge shall be imposed
12 in an amount equal to 100 percent (100%) of the portions of the water
13 bill that exceeds the respective percentages set in said section.

14 * * *

15 **Sec. 25.112. State Model Landscaping Ordinance adopted.**

16 The Department of Water Resources State Model Landscaping
17 Ordinance as amended from time to time is adopted by reference and is
18 incorporated as part of this article and shall become effective
19 January 1, 2010.

20 Three (3) copies of the most current Department of Water
21 Resources State Model Landscaping Ordinance are on file in the office
22 of the city clerk.
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Appendix N

Notice of Phase 1 Water Supply Shortage

RESOLUTION NO. 2014-51

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF VERNON DECLARING A PHASE I WATER SUPPLY SHORTAGE PURSUANT TO SECTION 25.103 OF THE VERNON MUNICIPAL CODE

WHEREAS, the State Water Resources Control Board (the "SWRCB") approved Resolution No. 2014-0038 (the "SWRCB Resolution") that adopts California Code of Regulations, Title 23, Sections 863, 864, and 865 in response to the persistent drought conditions in the State of California; and

WHEREAS, Regulation Section No. 865 (b)(1), states that "to promote water conservation, each urban water supplier shall implement all requirements and actions of the stage of its water shortage contingency plan that imposes mandatory restrictions on outdoor irrigation of ornamental landscapes or turf with potable water"; and

WHEREAS, by memorandum dated August 5, 2014, the Director of Public Works, Water and Development Services has recommended the City Council declare a Phase I Water Supply Shortage pursuant to Vernon Municipal Code Section 25.103; and

WHEREAS, the City Council determines that it is likely that the City of Vernon will suffer a shortage in City water supplies up to twenty (20%) percent; and

WHEREAS, the Council desires to declare a Phase I water supply shortage.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF VERNON AS FOLLOWS:

SECTION 1: The City Council of the City of Vernon hereby finds and determines that the above recitals are true and correct.

SECTION 2: The City Council of the City of Vernon finds

that this action is not subject to the California Environmental Quality Act (CEQA), in accordance with (a) CEQA Guidelines Section 15061 (b) (3), the general rule that CEQA only applies to projects that may have an effect on the environment; and (b) Section 15307, because it is an action taken by a regulatory agency to assure the "maintenance, restoration or enhancement" of natural resources and includes procedures to protect the environment.

SECTION 3: The City Council of the City of Vernon hereby declares a Phase I Water Supply Shortage pursuant to Section 25.103 of the Vernon Municipal Code.

SECTION 4: The City Clerk, or Deputy City Clerk, of the City of Vernon shall certify to the passage, approval and adoption of this resolution, and the City Clerk, or Deputy City Clerk, of the City of Vernon shall cause this resolution and the City Clerk's, or Deputy City Clerk's, certification to be entered in the File of Resolutions of the Council of this City.

APPROVED AND ADOPTED this 5th day of August, 2014.



Name: W. Michael McCormick

Title: Mayor / ~~Mayor Pro Tem~~

ATTEST:



Ana Barcia

City Clerk / Deputy City Clerk

APPROVED AS TO FORM:



Scott Porter, Deputy City Attorney

STATE OF CALIFORNIA)
) ss
COUNTY OF LOS ANGELES)

I, **Ana Barcia**, ~~City Clerk~~ / Deputy City Clerk of the City of Vernon, do hereby certify that the foregoing Resolution, being Resolution No. 2014-51, was duly passed, approved and adopted by the City Council of the City of Vernon at a regular meeting of the City Council duly held on Tuesday, August 5, 2014, and thereafter was duly signed by the Mayor or Mayor Pro-Tem of the City of Vernon.

Executed this 7 day of August, 2014, at Vernon, California.




Ana Barcia
~~City Clerk~~ / Deputy City Clerk

(SEAL)

TRANSMITTAL COMMUNICATION

CITY CLERK'S OFFICE

INTEROFFICE MEMORANDUM

DATE: August 7, 2014
TO: S. Kevin Wilson, Director of Public Works, Water & Development Services
FROM: Deborah Juarez, Records Management Assistant 
RE: Resolution No. 2014-51 – A Resolution of the City Council of the City of Vernon
Declaring a Phase I Water Supply Shortage Pursuant to Section 25.103 of the Vernon
Municipal Code

Please find a copy attached of Resolution No. 2014-51 referenced above, which was approved by City Council on August 5, 2014.

Thank you.

Attachment

c: Scott Rigg
Resolution No. 2014-51

STAFF REPORT

RECEIVED

JUL 30 2014



RECEIVED

JUL 29 2014

CITY ADMINISTRATION

A handwritten signature in black ink, appearing to be "M. Wilson", is written over a circular stamp or seal.

**CITY CLERK'S OFFICE STAFF REPORT
DEPARTMENT OF PUBLIC WORKS, WATER AND
DEVELOPMENT SERVICES**

DATE: August 5, 2014

TO: Honorable Mayor and City Council

FROM: Samuel Kevin Wilson, ⁴⁴Director of Public Works, Water and Development Services

RE: State Water Resources Control Board Resolution No. 2014-0038 – Emergency Regulation for Statewide Urban Water Conservation – Recommending City Council Declare a Phase I Water Supply Shortage

Recommendation

It is recommended that the City Council:

1. Find that declaring a Phase I Water Supply Shortage pursuant to Vernon Municipal Code § 25.103 is exempt under the California Environmental Quality Act (CEQA) in accordance with (a) CEQA Guidelines Section 15061 (b)(3), the general rule that CEQA only applies to projects that may have an effect on the environment; and (b) Section 15307, because it is an action taken by a regulatory agency to assure the "maintenance, restoration, or enhancement" of natural resources and includes procedures to protect the environment; and
2. Adopt the attached resolution declaring a Phase I Water Supply Shortage pursuant to Vernon Municipal Code Section 25.103.

Background

In response to persistent drought conditions in the State of California, on July 15, 2014, the State Water Resources Control Board ("SWRCB") approved Resolution No. 2014-0038 (the "SWRCB Resolution") that adopts California Code of Regulations, Title 23, Sections 863, 864, and 865 (the "Regulations"). The SWRCB Resolution mandates that the public take specified actions to conserve water supplies. The Regulations will become effective following submittal to the Office of Administrative Law, likely in early August. The Regulations will remain in effect for 270 days, unless extended by the SWRCB. Failures of individuals to follow the prescribed prohibited activities could result in civil or criminal penalties punishable by a fine up to \$500 for each day the violation occurs.

established and posted by the City. In addition, watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited between the hours of 6:00 a.m. and 6:00 p.m.

(b) Obligation to fix leaks, breaks or malfunctions: All leaks, breaks or malfunctions in the water user's plumbing or distribution system must be repaired within seventy two (72) hours of notification by the City."

Fiscal Impact

Staff anticipates any financial impact would be less than \$50,000 (less than one percent of the City's projected water revenues) because the City imposes minimal irrigated landscaping requirements. The loss in revenue will be offset by a reduction in the demand for Metropolitan Water District surface water that is purchased through the Central Basin Municipal Water District.

SKW/sr

Enclosures

**STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2014-0038**

**TO ADOPT AN EMERGENCY REGULATION
FOR STATEWIDE URBAN WATER CONSERVATION**

WHEREAS:

1. On April 25, 2014, Governor Edmund G. Brown Jr. issued an executive order to strengthen the state's ability to manage water and habitat effectively in drought conditions and called on all Californians to redouble their efforts to conserve water. The executive order finds that the continuous severe drought conditions present urgent challenges across the state including water shortages in communities and for agricultural production, increased wildfires, degraded habitat for fish and wildlife, threat of saltwater contamination, and additional water scarcity if drought conditions continue into 2015. The National Integrated Drought Information System reported that nearly 80% of the state was reported to be under "extreme" drought conditions at the end of June;
2. The executive order refers to the Governor's Proclamation No. 1-17-2014, issued on January 17, 2014, declaring a State of Emergency to exist in California due to severe drought conditions. The January Proclamation notes that the state is experiencing record dry conditions, with 2014 projected to become the driest year on record. Since January, state water officials indicate that reservoirs, rainfall totals and the snowpack remain critically low. This follows two other dry or below average years, leaving reservoir storage at alarmingly low levels. The January Proclamation highlights the State's dry conditions, lack of precipitation and the resulting effects on drinking water supplies, the cultivation of crops, and the survival of animals and plants that rely on California's rivers and streams. The January Proclamation also calls on all Californians to reduce their water usage by 20 percent;
3. There is no guarantee that winter precipitation will alleviate the drought conditions that the executive orders address, which will lead to even more severe impacts across the state if the drought wears on;
4. Water Code section 1058.5 grants the State Water Board the authority to adopt emergency regulations in certain drought years in order to: "prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion, of water, to promote water recycling or water conservation, to require curtailment of diversions when water is not available under the diverter's priority of right, or in furtherance of any of the foregoing, to require reporting of diversion or use or the preparation of monitoring reports";
5. Over 400,000 acres of farmland are expected to be fallowed, thousands of people may be out of work, communities risk running out of drinking water, and fish and wildlife will suffer.

15. Disadvantaged communities may require assistance in increasing water conservation and state agencies should look for opportunities to provide assistance in promoting water conservation;
16. Nothing in the regulations or in the enforcement provisions of the regulations, preclude a local agency from exercising its authority to adopt more stringent conservation measures. Moreover, the Water Code does not impose a mandatory penalty for violations of the regulations adopted by this resolution and local agencies retain their enforcement discretion in enforcing the regulations, to the extent authorized, and may develop their own progressive enforcement practices to encourage conservation.

THEREFORE BE IT RESOLVED THAT:

1. The State Water Board adopts California Code of Regulations, title 23, sections 863, 864, and 865, as appended to this resolution as an emergency regulation;
2. The State Water Board staff will submit the regulation to the Office of Administrative Law (OAL) for final approval;
3. If, during the approval process, State Water Board staff, the State Water Board, or OAL determines that minor corrections to the language of the regulation or supporting documentation are needed for clarity or consistency, the State Water Board Executive Director or designee may make such changes;
4. These regulations shall remain in effect for 270 days after filing with the Secretary of State unless the State Water Board determines that it is no longer necessary due to changed conditions, or unless the State Water Board renews the regulations due to continued drought conditions as described in Water Code section 1058.5;
5. The State Water Board directs staff to provide the Board with monthly updates on the implementation of the emergency regulations and their effect;
6. Directs State Water Board staff to condition funding upon compliance with the emergency regulations, to the extent feasible;
7. Directs State Water Board staff to work with the Department of Water Resources and the Save Our Water campaign to disseminate information regarding the emergency regulations; and
8. Directs State Water Board staff in developing an electronic reporting portal to include data fields so that local agencies may provide monthly reporting data on (i) conservation-related implementation measures or enforcement actions taken by the local agency and (ii) substitution during the drought of potable water with recycled water to extend water supplies.

11. The State Water Board calls on all Californians to take the following additional actions:
 - Further reduce water demand, whether by using less water in daily routines indoors and out, retrofitting appliances and installing greywater and rainwater catchment systems; and
 - Check residential and business water bills to see if there are high charges that may indicate a leak and to fix the leak, if they are able, or contact their local water utility if they need assistance.
12. The State Water Board encourages its staff, the Department of Water Resources, the Public Utilities Commission, urban water suppliers, and other local agencies to look for opportunities to encourage and promote new technologies that reduce water usage, including through timely access to water usage information and behavioral response.
13. The State Water Board encourages all state and local agencies to look for additional opportunities to minimize potable water use in outdoor spaces.
14. The State Water Board encourages investor-owned utilities to expeditiously submit applications for implementation of the regulations to the California Public Utilities Commission.

CERTIFICATION


The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on July 15, 2014.

AYE: Chair Felicia Marcus
 Vice Chair Frances Spivy-Weber
 Board Member Steven Moore
 Board Member Dorene D'Adamo

NAY: None

ABSENT: Board Member Tam M. Doduc

ABSTAIN: None



Jeanine Townsend
Clerk to the Board

PROPOSED TEXT OF EMERGENCY REGULATIONS

Sec. 865 Mandatory Actions by Water Suppliers

(a) The term "urban water supplier," when used in this section, refers to a supplier that meets the definition set forth in Water Code section 10617, except it does not refer to suppliers when they are functioning solely in a wholesale capacity, but does apply to suppliers when they are functioning in a retail capacity.

(b)(1) To promote water conservation, each urban water supplier shall implement all requirements and actions of the stage of its water shortage contingency plan that imposes mandatory restrictions on outdoor irrigation of ornamental landscapes or turf with potable water.

(2) As an alternative to subdivision (b)(1), an urban water supplier may submit a request to the Executive Director for approval of an alternate plan that includes allocation-based rate structures that satisfies the requirements of chapter 3.4 (commencing with section 370) of division 1 of the Water Code, and the Executive Director may approve such an alternate plan upon determining that the rate structure, in conjunction with other measures, achieves a level of conservation that would be superior to that achieved by implementing limitations on outdoor irrigation of ornamental landscapes or turf with potable water by the persons it serves to no more than two days per week.

(c) To promote water conservation, each urban water supplier that does not have a water shortage contingency plan or has been notified by the Department of Water Resources that its water shortage contingency plan does not meet the requirements of Water Code section 10632 shall, within thirty (30) days, limit outdoor irrigation of ornamental landscapes or turf with potable water by the persons it serves to no more than two days per week or shall implement another mandatory conservation measure or measures intended to achieve a comparable reduction in water consumption by the persons it serves relative to the amount consumed in 2013.

(d) In furtherance of the promotion of water conservation each urban water supplier shall prepare and submit to the State Water Resources Control Board by the 15th of each month a monitoring report on forms provided by the Board. The monitoring report shall include the amount of potable water the urban water supplier produced, including water provided by a wholesaler, in the preceding calendar month and shall compare that amount to the amount produced in the same calendar month in 2013. Beginning October 15, 2014, the monitoring report shall also estimate the gallons of water per person per day used by the residential customers it serves. In its initial monitoring report, each urban water supplier shall state the number of persons it serves.

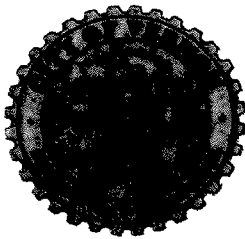
(e) To promote water conservation, each distributor of a public water supply, as defined in Water Code section 350, that is not an urban water supplier shall, within thirty (30) days, take one or more of the following actions:

(1) Limit outdoor irrigation of ornamental landscapes or turf with potable water by the persons it serves to no more than two days per week; or

(2) Implement another mandatory conservation measure or measures intended to achieve a comparable reduction in water consumption by the persons it serves relative to the amount consumed in 2013.

Authority: Wat. Code, § 1058.5.

References: Wat. Code, §§ 102, 104, 105; 350; 10617; 10632.



August 5, 2014

NOTICE OF PHASE 1 WATER SUPPLY SHORTAGE

Due to persistent drought conditions in the State of California, the Vernon City Council declared a Phase 1 Water Supply Shortage, pursuant to Vernon Municipal Code 25.103, at its August 5, 2014 meeting. The following water conservation requirements apply during a declared Phase I Water Supply Shortage and are effective immediately:

1. Limits on watering days: Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to three (3) times per week on a schedule established and posted by the City. **The City has determined that irrigation of landscaped areas may only be performed on Mondays, Wednesdays, and Fridays.** Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited between the hours of 6:00 a.m. and 6:00 p.m. Pacific Standard Time. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.
2. Obligation to fix leaks, breaks or malfunctions: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within seventy-two (72) hours of notification by the City unless other arrangements are made with the City.

In addition, Vernon Municipal Code 25.101, "General Prohibition," provides for water conservation requirements including, but not limited to watering durations of no more than fifteen (15) minutes watering per day per station; excessive water or flow runoff, and washing down hard or paved surfaces except to maintain sanitary conditions. Vernon Municipal Code Section 1.8, "General Penalty; Continuing Violations," allows for fines of up to \$500 per violation for repeat offenders. Additional information on Vernon Municipal Code Sections 1.8, 25.101 and 25.103 are available online at www.cityofvernon.org.

For information on water conservation tips, please go to www.saveourh2o.org, or www.bewaterwise.com. If you have any questions or concerns as they relate to the above-mentioned conservation measures, please contact Scott B. Rigg of my staff by phone at (323) 583-8811 extension 279 or by email at srigg@ci.vernon.ca.us.

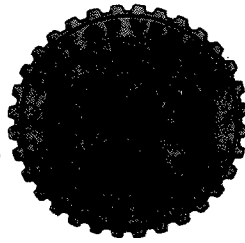
Sincerely,

A handwritten signature in black ink, appearing to read "Samuel Kevin Wilson", is written over a horizontal line.

Samuel Kevin Wilson, P.E.

Director of Public Works, Water and Development Services





5 de agosto 2014

AVISO DE LA FASE 1 ESCASEZ DE AGUA

Debido a la grave sequía en el estado de California, el Consejo Municipal de la Ciudad de Vernon ha declarado Fase 1 Escasez de Abastecimiento de Agua, en conformidad con el Código Municipal 25.103 de Vernon en la reunión del 5 de agosto del 2014. Los siguientes requisitos de conservación de agua se aplican durante una declarada Escasez de la Fase I de Abastecimiento de Agua y están en efecto inmediatamente:

1. Límites en los días de riego: El riego o irrigación del césped, jardín u otra área con vegetación con agua potable se limita a tres (3) veces por semana en un horario establecido y publicado por la Ciudad. **La Ciudad ha determinado que el riego de las zonas ajardinadas sólo puede llevarse a cabo los lunes, miércoles y viernes.** El riego o irrigación del césped, jardín u otra área con vegetación con agua potable está prohibida entre las horas de 6:00 am y 6:00 pm, hora Pacífico. Esta disposición no se aplica a zonas de riego que utilizan exclusivamente sistemas de tipo de riego muy bajos con un goteo flujo el cual ningún emisor producirá más de dos (2) litros de agua por hora. Esta disposición tampoco se aplica para el riego o riego mediante el uso de un cubo de mano o recipiente similar, una manguera de mano equipada con un cierre de boquilla o dispositivo de agua de cierre automático, o por períodos muy cortos con el expreso propósito de ajustar o reparar un sistema de riego.
2. Obligación de reparar fugas, roturas o averías: Todas las fugas, roturas u otros fallos en el sistema de plomería o distribución del uso del agua deben ser reparados dentro de las setenta y dos (72) horas después de notificación por parte de la Ciudad a menos que se hagan otros arreglos con la Ciudad.

Además, el Código Municipal 25.101 de Vernon, "Prohibición general", establece los requisitos de conservación del agua, incluyendo, pero no limitado a la duración de riego de no más de quince (15) minutos de riego por día por estación; exceso de agua o el escurrimiento de flujo, y el lavado de mano dura o superficies pavimentadas, excepto para mantener las condiciones sanitarias. El Código Municipal de Vernon Sección 1.8, "Penalización General; Violaciones Existentes", "permite multas de hasta \$500 por violación a los infractores repetitivos. Información adicional sobre Secciones 1.8, 25.101 y 25.103 del Código Municipal de Vernon se encuentran disponibles en la página de internet, www.cityofvernon.org.

Para obtener información sobre consejos de conservación de agua, por favor vaya a www.saveourh2o.org o www.bewaterwise.com. Si tiene cualquier pregunta o preocupación en relación con las medidas de conservación mencionadas, por favor póngase en contacto con Scott B. Rigg de mi personal por teléfono al (323) 583-8811 extensión 279 o por correo electrónico a srigg@ci.vernon.ca.us.

Atentamente,

Samuel Kevin Wilson, P.E.

Director of Public Works, Water and Development Services



Appendix O

Notice of Phase 2 Water Supply Shortage

RESOLUTION NO. 2015-34

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF VERNON DECLARING A PHASE II WATER SUPPLY SHORTAGE PURSUANT TO SECTION 25.104 OF THE VERNON MUNICIPAL CODE

WHEREAS, in response to persistent drought conditions in the State of California, on July 15, 2014, the State Water Resources Control Board ("SWRCB") approved Resolution No. 2014-0038 that adopted California Code of Regulations, Title 23, Sections 863, 864, and 865 (the "Regulations"); and

WHEREAS, on May 5, 2015, the SWRCB approved Resolution No. 2015-0032 establishing further restrictions on potable water use in response to California's ongoing drought; and

WHEREAS, by memorandum dated June 2, 2015, the Director of Public Works, Water and Development Services has recommended the City Council declare a Phase II Water Supply Shortage pursuant to Vernon Municipal Code Section 25.104; except that provision (a) be modified to permit watering of landscapes to two days a week all year and provision (g), which requires mandatory water reductions, not be required at this time; and

WHEREAS, the City Council of the City of Vernon desires to declare a Phase II Water Supply Shortage.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF VERNON AS FOLLOWS:

SECTION 1: The City Council of the City of Vernon hereby finds and determines that the above recitals are true and correct.

SECTION 2: The City Council of the City of Vernon finds that this action is exempt under the California Environmental Quality Act (CEQA), in accordance with Section 15061(b)(3), the general rule

that CEQA only applies to projects that may have a significant effect on the environment; and (b) Section 15307, because it is an action taken by a regulatory agency, as authorized by state law, to assure the "maintenance, restoration, or enhancement" of natural resources and includes procedures to protect the environment.

SECTION 3: The City Council of the City of Vernon hereby declares a Phase II Water Supply Shortage pursuant to Section 25.104 of the Vernon Municipal Code except that section (a) be modified to read as follows: "(a) *Watering days:* Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to two (2) days per week on a schedule established and posted by the City. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip irrigation zones systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering by hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system. In addition, watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited between the hours of 6:00 a.m. and 6:00 p.m." Also excepting section (g) in its entirety, which requires mandatory water reductions.

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SECTION 4: The City Clerk, or Deputy City Clerk, of the City of Vernon shall certify to the passage, approval and adoption of this resolution, and the City Clerk, or Deputy City Clerk, of the City of Vernon shall cause this resolution and the City Clerk's, or Deputy City Clerk's, certification to be entered in the File of Resolutions of the Council of this City.

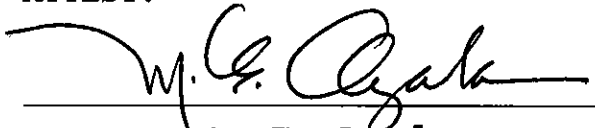
APPROVED AND ADOPTED this 2nd day of June, 2015.



Name: W. Michael McCormick

Title: Mayor / ~~Mayor Pro-Tem~~

ATTEST:



Maria E. Ayala

City Clerk / ~~Deputy City Clerk~~

APPROVED AS TO FORM:




Brian Byun, Deputy City Attorney

STATE OF CALIFORNIA)
) ss
COUNTY OF LOS ANGELES)

I, **Maria E. Ayala**, City Clerk / ~~Deputy City Clerk~~ of the City of Vernon, do hereby certify that the foregoing Resolution, being Resolution No. 2015-34, was duly passed, approved and adopted by the City Council of the City of Vernon at a regular meeting of the City Council duly held on Tuesday, June 2, 2015, and thereafter was duly signed by the Mayor or Mayor Pro-Tem of the City of Vernon.

Executed this 4th day of June, 2015, at Vernon, California.



Maria E. Ayala
City Clerk / ~~Deputy City Clerk~~

(SEAL)


TRANSMITTAL COMMUNICATION

CITY CLERK'S OFFICE

INTEROFFICE MEMORANDUM

DATE: June 9, 2015

TO: S. Kevin Wilson, Director of Public Works, Water & Development Services

FROM: Deborah Juarez, Records Management Assistant 

RE: Resolution No. 2015-34 -- A Resolution of the City Council of the City of Vernon
Declaring a Phase II Water Supply Shortage Pursuant to Section 25.104 of the Vernon
Municipal Code

Please find a copy attached of Resolution No. 2015-34 referenced above, which was approved by City Council on August 5, 2014.

Thank you.

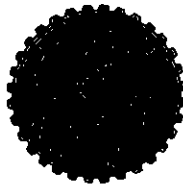
Attachment

c: Scott Rigg
Resolution No. 2015-34

RECEIVED

MAY 27 2015

CITY CLERK'S OFFICE



RECEIVED

MAY 27 2015

CITY ADMINISTRATION

**STAFF REPORT
DEPARTMENT OF PUBLIC WORKS, WATER AND
DEVELOPMENT SERVICES**

DATE: June 2, 2015

TO: Honorable Mayor and City Council

FROM: Samuel Kevin Wilson, ^{SW} Director of Public Works, Water and Development Services
Originator: Scott B. Rigg, Public Works and Water Superintendent *SR*

RE: State Water Resources Control Board Resolution No. 2015-0032 – To Adopt an Emergency Regulation for Statewide Urban Water Conservation – Recommending City Council Declare a Phase II Water Supply Shortage

Recommendation

It is recommended that the City Council:

- A. Find that declaring a Phase II Water Supply Shortage pursuant to Vernon Municipal Code § 25.104 is exempt under the California Environmental Quality Act (CEQA) in accordance with (a) CEQA Guidelines Section 15061 (b)(3), the general rule that CEQA only applies to projects that may have an effect on the environment; and (b) Section 15307, because it is an action taken by a regulatory agency to assure the “maintenance, restoration, or enhancement” of natural resources and includes procedures to protect the environment; and
- B. Adopt the attached resolution declaring a Phase II Water Supply Shortage pursuant to Vernon Municipal Code Section 25.104.

Background

In response to persistent drought conditions in the State of California, on July 15, 2014, the State Water Resources Control Board (“SWRCB”) approved Resolution No. 2014-0038 (the “SWRCB Resolution”) that adopted California Code of Regulations, Title 23, Sections 863, 864, and 865 (the “Regulations”). The SWRCB Resolution mandated that the public take specified actions to conserve water supplies. On May 5, 2015, the SWRCB approved Resolution No. 2015-0032 establishing further restrictions on potable water use in response to California’s ongoing drought.

The Regulations will require the City of Vernon (City), and all other urban water suppliers, to submit to the SWRCB by the 15th of each month, a monitoring report on forms provided by the SWRCB. The monitoring report must include the amount of potable water the urban water supplier produced, including water provided by a wholesaler, in the preceding calendar month, and compare that amount to the amount produced in the same calendar month in 2013. The monitoring report shall specify the population served by the urban water supplier, the percentage of water produced that is used for residential sector, descriptive statistics on water conservation compliance and enforcement efforts, and the number of days that outdoor irrigation is allowed, and monthly commercial, industrial and institutional sector use. The monitoring report shall also estimate the gallons of water per person per day used by the residential customers. In addition, each urban water supplier must reduce its total potable water production by the percentage identified as its conservation standard. Each urban water supplier's conservation standard considers its service area's relative per capita water usage. Water supplier's whose average July through September 2014 R-GPCD was 65 or more but less than 80 shall reduce its total potable water production by 12 percent for each month as compared to the amount used in the same month in 2013. The City was assigned a conservation standard of 12 percent based on the R-GPCD calculations performed by the SWRCB for July, August, and September of 2014. City staff performed the R-GPCD calculation for the above-mention months and came up with an R-GPCD of 63.88. This calculation would place the City a conservation standard of 8 percent. Staff is in the process of challenging the SWRCB's calculation.

Mandatory Water Restrictions

Regulation Sections Nos. 864 and 865 place Emergency Conservation Regulations on end-users (customers and businesses), and urban water suppliers as follows:

- a. To prevent the waste and unreasonable use of water and to promote water conservation, each of the following actions is prohibited, except where necessary to address an immediate health and safety need or to comply with a term or condition in a permit issued by a state or federal agency:
 1. The application of potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;
 2. The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use;
 3. The application of potable water to driveways and sidewalks;
 4. The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system;
 5. The application of potable water to outdoor landscapes during within 48 hours after measurable rainfall;
 6. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drinks are served and/or purchases;
 7. The irrigation with potable water of ornamental turf on public street medians; and
 8. The irrigation with potable water of landscapes outside newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the

California Building Standards Commission and the Department of Housing and Community Development.

9. The taking of any action prohibited in the above sections (a) or failure to take any action required in sections (b) or (c), is an infraction, punishable by a fine of up to five hundred dollars (\$500.00) for each day in which the violation occurs.

Vernon Municipal Code Section 25.101 already regulates the following outdoor potable water activities: watering hours, limits water durations, no excessive water flow or runoff, no washing down hard or paved surfaces, obligation to fix leaks, breaks or malfunctions; re-circulating water required for water fountains and decorative features, limits on washing vehicles, drinking water served upon request only at restaurants, and limits on commercial car wash and laundry systems. In addition, the City is currently under a Phase I Water Supply Shortage.

The City is now mandated to reduce its potable water consumption by twelve (12) percent. As stated earlier, the City is challenging the State's calculations, and believes this reduction goal will be lowered to eight (8) percent. In 2014, the City was able to reduce its water production by six (6) percent. In order to meet the states mandatory requirements additional water conservation measures are necessary beyond the City's current Phase I Water Shortage Requirements For Non-Urban Water Suppliers the State requires that outdoor irrigation of ornamental landscape be performed no more than two times per-week. It is recommended that the Phase II Water Supply Shortage be enacted; except that provision (a) be modified to permit watering of landscapes to two days a week all year and provision (g), which requires mandatory water reductions, not be required at this time. The Phase II requirements would therefore be as follows:

“(a) Limits on water days: Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to two (2) days per week on a schedule established and posted by the City. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system. In addition, watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited between the hours of 6:00 a.m. and 6:00 p.m.

(b) Obligation to fix leaks, breaks or malfunctions: All leaks, breaks or malfunctions in the water user's plumbing or distribution system must be repaired within forty eight (48) hours of notification by the City.”

(c) Limits on filling ornamental lakes or ponds: Filling or refilling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under this article.

(d) Limits on washing vehicles: Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not, is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle

or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a recirculating water system to capture or reuse water.

(e) Limits on filling residential swimming pools and spas: Refilling of more than one (1) foot and initial filling of residential swimming pools or outdoor spas with potable water is prohibited.

(f) Commercial nurseries watering limitations: Commercial Nurseries shall be prohibited from watering lawn, landscaped or other turf areas more often than every other day and shall be prohibited from watering between the hours of 10:00 a.m. and 4:00 p.m.

Fiscal Impact

By implementing Phase II Water Shortage requirements, the City hopes to encourage a two (2) percent reduction in water usage, which would result in two (2) percent loss in revenues of \$162,000 which would be offset by the need to purchase or provide water supplies. The total fiscal impact is anticipated to be less than \$50,000.00.

Attachments

1. Resolution Declaring a Phase II Water Supply Shortage
2. Copy of State Water Resources Control Board Resolution No. 2015-0032

SKW/sr

Enclosures

**STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2015-0032**

**TO ADOPT AN EMERGENCY REGULATION FOR
STATEWIDE URBAN WATER CONSERVATION**

WHEREAS:

1. On April 25, 2014, Governor Edmund G. Brown Jr. issued an executive order (April 2014 Proclamation) to strengthen the State's ability to manage water and habitat effectively in drought conditions, and called on all Californians to redouble their efforts to conserve water. The April 2014 Proclamation finds that the continuous severe drought conditions present urgent challenges across the State, including water shortages in communities and for agricultural production, increased wildfires, degraded habitat for fish and wildlife, threat of saltwater contamination, and additional water scarcity, if drought conditions continue into 2015. The April 2014 Proclamation also suspends the environmental review required by the California Environmental Quality Act to allow the emergency regulation and other actions to take place as quickly as possible;
2. The April 2014 Proclamation refers to the Governor's Proclamation No. 1-17-2014, issued on January 17, 2014, declaring a drought State of Emergency to exist in California due to severe drought conditions (January 2014 Proclamation). The January 2014 Proclamation finds that dry conditions and lack of precipitation present urgent problems to drinking water supplies and cultivation of crops, which put farmers' long-term investments at risk. The conditions also threaten the survival of animals and plants that rely on California's rivers, including many species in danger of extinction. The January 2014 Proclamation also calls on all Californians to reduce their water usage by 20 percent;
3. On December 22, 2014, in light of the continued lack of rain, Governor Brown issued Executive Order B-28-14, which extends the California Environmental Quality Act suspension through May 31, 2016 for Water Code section 13247 and certain activities identified in the January 2014 and April 2014 proclamations;
4. On April 1, 2015, Governor Brown issued a new Executive Order that directs the State Water Board to impose restrictions on urban water suppliers to achieve a statewide 25 percent reduction in potable urban usage through February 2016; require commercial, industrial, and institutional users to implement water efficiency measures; prohibit irrigation with potable water of ornamental turf in public street medians; and prohibit irrigation with potable water outside newly constructed homes and buildings that is not delivered by drip or microspray systems; along with other directives;
5. Water Code section 1058.5 grants the State Water Board the authority to adopt emergency regulations in certain drought years in order to: "prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion, of water, to promote water recycling or water conservation, to require curtailment of diversions when water is not available under the diverter's priority of right, or in furtherance of any of the foregoing, to require reporting of diversion or use or the preparation of monitoring reports";

6. On July 15, 2014, the State Water Board adopted an emergency regulation to support water conservation (Resolution No. 2014-0038), and that regulation became effective July 28, 2014 upon approval by the Office of Administrative Law (OAL);
7. On March 17, 2015, the State Water Board amended and readopted the emergency regulation to support water conservation (Resolution No. 2015-0013), which became effective March 27, 2015 upon approval by OAL;
8. The current emergency regulation has supported Californians' water conservation efforts, with over 125 billion gallons saved from August 2014 through March 2015; however, statewide water use is only nine percent less than the same months in 2013. Achieving a 25 percent reduction in use will require even greater conservation efforts across the state. In particular, many communities must dramatically reduce their outdoor water use;
9. In many areas, 50 percent or more of daily water use is for lawns and outdoor landscaping. Outdoor water use is generally discretionary, and many irrigated landscapes will survive while receiving a decreased amount of water;
10. Although urban water suppliers have placed restrictions on outdoor watering, the State Water Board continues to receive reports of excessive outdoor water use;
11. Water conservation is the easiest, most efficient and most cost-effective way to quickly reduce water demand and extend supplies into the next year, providing flexibility for all California communities. Water saved this summer is water available later in the season or next year, reducing the likelihood of even more severe water shortages should the drought continue;
12. Education and enforcement against water waste is a key tool in conservation programs. When conservation becomes a social norm in a community, the need for enforcement is reduced or eliminated;
13. Public information and awareness is critical to achieving conservation goals, and the Save Our Water campaign, run jointly by the Department of Water Resources (DWR) and the Association of California Water Agencies, is an excellent resource for conservation information and messaging that is integral to effective drought response (<http://saveourwater.com>);
14. Many California communities are facing social and economic hardship due to this drought. The rest of us can make adjustments to our water use, including landscape choices that conserve even more water;
15. The California Constitution declares, at article X, section 2, that the water resources of the state must be put to beneficial use in a manner that is reasonable and not wasteful. Relevant to the current drought conditions, the California Supreme Court has clarified that "what may be a reasonable beneficial use, where water is present in excess of all needs, would not be a reasonable beneficial use in an area of great scarcity and great need. What is a beneficial use at one time may, because of changed conditions, become a waste of water at a later time." (*Tulare Dist. v. Lindsay Strathmore Dist.* (1935) 3 Cal.2d 489, 567.) In support of water conservation, the legislature has, through Water Code section 1011, deemed reductions in water use due to conservation as equivalent

to reasonable beneficial use of that water. Accordingly, this regulation is in furtherance of article X, section 2 during this drought emergency. This temporary emergency regulation is not to be used in any future administrative or judicial proceedings as evidence or finding of waste and unreasonable use of any individual water user or water supplier subject to this regulation, and are not to affect or otherwise limit any rights to water conserved under applicable law, including without limitation, water conserved consistent with Water Code section 1011;

16. Directive two of the Governor's April 1, 2015 Executive Order directs the State Water Board to consider the relative per capita usage of each urban water supplier's service area and require that areas with high per capita use achieve proportionally greater reductions than areas with low per capita use;
17. On April 7, 2015, the State Water Board issued a draft framework proposing increasing levels of required water reduction based upon residential per capita per day use (R-GPCD) for the proposed regulation, and solicited public comments. The Board received over 300 comments on the framework, primarily relating to the levels of required water reduction;
18. On April 18, the State Water Board issued draft regulatory language for public comment based on the April 7 framework and the comments received. The draft regulatory language reflected careful consideration of all comments including those directed at the levels of required reduction. Again, the Board received close to 300 comments;
19. On April 28, 2015, the State Water Board issued a final version of draft regulatory language for comment, followed on April 29 by a formal public notice that it would consider the adoption of the emergency regulation at the Board's regularly-scheduled May 5 and 6, 2015 public meeting, in accordance with applicable State laws and regulations. The State Water Board also distributed for public review and comment a Finding of Emergency that complies with State laws and regulations;
20. As discussed above, the State Water Board is adopting the emergency regulation because of the continuing emergency drought conditions, the need for prompt action to prevent the waste and unreasonable use of water and to promote conservation, and the specific actions called for in the Governor's April 1, 2015 Executive Order; and
21. Nothing in the regulation or in the enforcement provisions of the regulation precludes a local agency from exercising its authority to adopt more stringent conservation measures. Moreover, the Water Code does not impose a mandatory penalty for violations of the regulation adopted by this resolution, and local agencies retain the enforcement discretion in enforcing the regulation to the extent authorized. Local agencies are encouraged to develop their own progressive enforcement practices to promote conservation.

THEREFORE BE IT RESOLVED THAT:

1. The State Water Board adopts California Code of Regulations, title 23, section 866 and re-adopts sections 863, 864, and 865, as appended to this resolution as an emergency regulation;

2. State Water Board staff will submit the regulation to OAL for final approval;
3. If, during the approval process, State Water Board staff, the State Water Board, or OAL determines that minor corrections to the language of the regulation or supporting documentation are needed for clarity or consistency, the State Water Board Executive Director or the Executive Director's designee may make such changes;
4. This regulation shall remain in effect for 270 days after filing with the Secretary of State unless the State Water Board determines that it is no longer necessary due to changed conditions, or unless the State Water Board renews the regulation due to continued drought conditions as described in Water Code section 1058.5;
5. The State Water Board directs staff to provide the Board with monthly updates on the implementation of the emergency regulation and its effect. These updates shall include information regarding the progress of the Building Standards Commission, Department of Housing and Community Development, and other state agencies in the adoption and implementation of emergency regulations or other requirements that implement increased outdoor irrigation efficiency for new construction. These regulations and other requirements will extend existing efficiency standards for new construction to the outdoor environment and ensure that California's new homes are constructed to meet the growing demand with the most efficient standards;
6. The State Water Board directs staff to condition funding upon compliance with the emergency regulation, to the extent feasible;
7. The State Water Board directs staff to work with DWR and the Save Our Water campaign to disseminate information regarding the emergency regulation; and
8. The State Water Board directs staff to update the electronic reporting portal to include data fields for the new reporting required by the emergency regulation.

THEREFORE BE IT FURTHER RESOLVED THAT:

9. The State Water Board shall work with DWR, the Public Utilities Commission, and other agencies to support urban water suppliers' actions to implement rates and pricing structures to incent additional conservation, as required by directive eight in the Governor's April 1, 2015 Executive Order. The Fourth District Court of Appeal's recent Decision in *Capistrano Taxpayer Association Inc. v. City of San Juan Capistrano* (G048969) does not foreclose the use of conservation-oriented rate structures;
10. The State Water Board calls upon water suppliers to:
 - a. ensure that adequate personnel and financial resources exist to implement conservation requirements not only for 2015, but also for another year of drought should it occur. Water suppliers that face budget shortfalls due to reduced sales should take immediate steps to raise necessary revenues in a way that actively promotes continued conservation;
 - b. expedite implementation of new conservation programs by minimizing internal review periods and utilizing emergency authorities, as appropriate;

- c. consider the relative water use and conservation practices of their customers and target those with higher water use to achieve proportionally greater reductions than those with low use;
 - d. minimize financial impacts to low-income customers;
 - e. preserve safe indoor water supplies in areas with very low R-GPCD and where necessary to protect public health and safety;
 - f. promote low-water use methods of preserving appropriate defensible space in fire-prone areas, consistent with local fire district requirements;
 - g. educate customers on the preservation of trees;
 - h. promote on-site reuse of water; and
 - i. promptly notify staff of the supplier's need for an alternate method of compliance pursuant to resolved paragraph 16.
11. The State Water Board calls upon all businesses within California's travel and tourism sectors to inform visitors of California's dire drought situation and actions visitors should take to conserve water;
 12. The State Water Board commends wholesale water agencies that have set aggressive conservation targets for their retail water suppliers;
 13. The State Water Board commends water suppliers that have made investments to boost drought-resistant supplies, such as advanced treated recycled water and desalination. Those investments help to make communities more resilient in the face of drought;
 14. The State Water Board commends the many water suppliers that have already surpassed their 20x2020 conservation targets. Long-term conservation efforts are critical to maintaining economic and social well-being, especially in light of the impacts of climate change on California's hydrology;
 15. During this drought emergency, heightened conservation that extends urban resilience is necessary. The State Water Board's focus is primarily on immediate reductions in outdoor water use. Some short-term conservation efforts, such as landscape conversions and installation of efficient appliances, will also support long-term conservation objectives, and are encouraged wherever possible;
 16. The State Water Board recognizes that some commercial and industrial customers, while accounting for a significant portion of total use in a service area, have already taken steps to significantly reduce their water consumption and cannot further reduce their use without substantial impacts. However, the Board also recognizes that in many areas there are significant opportunities for reductions in water use by industries and commercial enterprises that have yet to take action, especially those with large areas of non-functional turf. The Board directs staff to respond promptly upon receipt of any request for alternate enforceable methods of compliance. If the supplier believes the conservation standard is unachievable due to firm commercial and industrial water use

and residential use reductions that would affect public health and safety, it should provide any supporting information or documentation for an alternate method of compliance; and

17. Some water suppliers have called for further refinement of the tiers to reflect a range of factors that contribute to water use, including but not limited to temperature, lot size, and income. Others have called for an approach that provides greater recognition for early investments in conservation, the development of local, drought resistant water supplies, and health and safety needs. These suggestions and many others are important considerations in the development of a more comprehensive, and long term, conservation framework. The State Water Board directs staff to work with stakeholders on a thoughtful process to devise options for extended and expanded emergency regulations should the drought continue into 2016.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on May 5, 2015.

AYE: Chair Felicia Marcus
Vice Chair Frances Spivy-Weber
Board Member Tam M. Doduc
Board Member Steven Moore
Board Member Dorene D'Adamo

NAY: None

ABSENT: None

ABSTAIN: None



Jeanine Townsend
Clerk to the Board

ADOPTED TEXT OF EMERGENCY REGULATION

Article 22.5. Drought Emergency Water Conservation.

Sec. 863. Findings of Drought Emergency.

(a) The State Water Resources Control Board finds as follows:

(1) On January 17, 2014, the Governor issued a proclamation of a state of emergency under the California Emergency Services Act based on drought conditions;

(2) On April 25, 2014, the Governor issued a proclamation of a continued state of emergency under the California Emergency Services Act based on continued drought conditions;

(3) On April 1, 2015, the Governor issued an Executive Order that, in part, directs the State Board to impose restrictions on water suppliers to achieve a statewide 25 percent reduction in potable urban usage through February, 2016; require commercial, industrial, and institutional users to implement water efficiency measures; prohibit irrigation with potable water of ornamental turf in public street medians; and prohibit irrigation with potable water outside newly constructed homes and buildings that is not delivered by drip or microspray systems;

(4) The drought conditions that formed the basis of the Governor's emergency proclamations continue to exist;

(5) The present year is critically dry and has been immediately preceded by two or more consecutive below normal, dry, or critically dry years; and

(6) The drought conditions will likely continue for the foreseeable future and additional action by both the State Water Resources Control Board and local water suppliers will likely be necessary to prevent waste and unreasonable use of water and to further promote conservation.

Authority: Section 1058.5, Water Code.

References: Cal. Const., Art., X § 2; Sections 102, 104, 105, and 275, Water Code; *Light v. State Water Resources Control Board* (2014) 226 Cal.App.4th 1463.

Sec. 864. End-User Requirements in Promotion of Water Conservation.

(a) To prevent the waste and unreasonable use of water and to promote water conservation, each of the following actions is prohibited, except where necessary to address an immediate health and safety need or to comply with a term or condition in a permit issued by a state or federal agency:

(1) The application of potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;

(2) The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use;

(3) The application of potable water to driveways and sidewalks; and

(4) The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system;

(5) The application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall;

(6) The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;

(7) The irrigation with potable water of ornamental turf on public street medians; and

(8) The irrigation with potable water of landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.

(b) To promote water conservation, operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guestroom using clear and easily understood language.

(c) Immediately upon this subdivision taking effect, all commercial, industrial and institutional properties that use a water supply, any portion of which is from a source other than a water supplier subject to section 865, shall either:

(1) Limit outdoor irrigation of ornamental landscapes or turf with potable water to no more than two days per week; or

(2) Reduce potable water usage supplied by sources other than a water supplier by 25 percent for the months of June 2015 through February 2016 as compared to the amount used from those sources for the same months in 2013.

(d) The taking of any action prohibited in subdivision (a) or the failure to take any action required in subdivisions (b) or (c), is an infraction, punishable by a fine of up to five hundred dollars (\$500) for each day in which the violation occurs. The fine for the infraction is in addition to, and does not supersede or limit, any other remedies, civil or criminal.

Authority: Section 1058.5, Water Code.

References: Cal. Const., Art., X § 2; Sections 102, 104, 105, 275, 350, and 10617, Water Code; *Light v. State Water Resources Control Board* (2014) 226 Cal.App.4th 1463.

Sec. 865. Mandatory Actions by Water Suppliers.

(a) As used in this section:

(1) "Distributor of a public water supply" has the same meaning as under section 350 of the Water Code, except it does not refer to such distributors when they are functioning solely in a wholesale capacity, but does apply to distributors when they are functioning in a retail capacity.

(2) "R-GPCD" means residential gallons per capita per day.

- (3) "Total potable water production" means all potable water that enters into a water supplier's distribution system, excluding water placed into storage and not withdrawn for use during the reporting period, or water exported outside the supplier's service area.
- (4) "Urban water supplier" means a supplier that meets the definition set forth in Water Code section 10617, except it does not refer to suppliers when they are functioning solely in a wholesale capacity, but does apply to suppliers when they are functioning in a retail capacity.

(b) In furtherance of the promotion of water conservation each urban water supplier shall:

(1) Provide prompt notice to a customer whenever the supplier obtains information that indicates that a leak may exist within the end-user's exclusive control.

(2) Prepare and submit to the State Water Resources Control Board by the 15th of each month a monitoring report on forms provided by the Board. The monitoring report shall include the amount of potable water the urban water supplier produced, including water provided by a wholesaler, in the preceding calendar month and shall compare that amount to the amount produced in the same calendar month in 2013. The monitoring report shall specify the population served by the urban water supplier, the percentage of water produced that is used for the residential sector, descriptive statistics on water conservation compliance and enforcement efforts, and the number of days that outdoor irrigation is allowed, and monthly commercial, industrial and institutional sector use. The monitoring report shall also estimate the gallons of water per person per day used by the residential customers it serves.

(c)(1) To prevent the waste and unreasonable use of water and to meet the requirements of the Governor's April 1, 2015 Executive Order, each urban water supplier shall reduce its total potable water production by the percentage identified as its conservation standard in this subdivision. Each urban water supplier's conservation standard considers its service area's relative per capita water usage.

(2) Each urban water supplier whose source of supply does not include groundwater or water imported from outside the hydrologic region in which the water supplier is located, and that has a minimum of four years' reserved supply available may, submit to the Executive Director for approval a request that, in lieu of the reduction that would otherwise be required under paragraphs (3) through (10), the urban water supplier shall reduce its total potable water production by 4 percent for each month as compared to the amount used in the same month in 2013. Any such request shall be accompanied by information showing that the supplier's sources of supply do not include groundwater or water imported from outside the hydrologic region and that the supplier has a minimum of four years' reserved supply available.

(3) Each urban water supplier whose average July-September 2014 R-GPCD was less than 65 shall reduce its total potable water production by 8 percent for each month as compared to the amount used in the same month in 2013.

(4) Each urban water supplier whose average July-September 2014 R-GPCD was 65 or more but less than 80 shall reduce its total potable water production by 12 percent for each month as compared to the amount used in the same month in 2013.

(5) Each urban water supplier whose average July-September 2014 R-GPCD was 80 or more but less than 95 shall reduce its total potable water production by 16 percent for each month as compared to the amount used in the same month in 2013.

(6) Each urban water supplier whose average July-September 2014 R-GPCD was 95 or more but less than 110 shall reduce its total potable water production by 20 percent for each month as compared to the amount used in the same month in 2013.

(7) Each urban water supplier whose average July-September 2014 R-GPCD was 110 or more but less than 130 shall reduce its total potable water production by 24 percent for each month as compared to the amount used in the same month in 2013.

(8) Each urban water supplier whose average July-September 2014 R-GPCD was 130 or more but less than 170 shall reduce its total potable water production by 28 percent for each month as compared to the amount used in the same month in 2013.

(9) Each urban water supplier whose average July-September 2014 R-GPCD was 170 or more but less than 215 shall reduce its total potable water production by 32 percent for each month as compared to the amount used in the same month in 2013.

(10) Each urban water supplier whose average July-September 2014 R-GPCD was 215 or more shall reduce its total potable water production by 36 percent for each month as compared to the amount used in the same month in 2013.

(d)(1) Beginning June 1, 2015, each urban water supplier shall comply with the conservation standard specified in subdivision (c).

(2) Compliance with the requirements of this subdivision shall be measured monthly and assessed on a cumulative basis.

(e)(1) Each urban water supplier that provides potable water for commercial agricultural use meeting the definition of Government Code section 51201, subdivision (b), may subtract the amount of water provided for commercial agricultural use from its potable water production total, provided that any urban water supplier that subtracts any water provided for commercial agricultural use from its total potable water production shall:

(A) Impose reductions determined locally appropriate by the urban water supplier, after considering the applicable urban water supplier conservation standard specified in subdivision (c), for commercial agricultural users meeting the definition of Government Code section 51201, subdivision (b) served by the supplier;

(B) Report its total potable water production pursuant to subdivision (b)(2) of this section, the total amount of water supplied for commercial agricultural use, and shall identify the reduction imposed on its commercial agricultural users and each recipient of potable water for commercial agricultural use;

(C) Certify that the agricultural uses it serves meet the definition of Government Code section 51201, subdivision (b); and

(D) Comply with the Agricultural Water Management Plan requirement of paragraph 12 of the April 1, 2015 Executive Order for all commercial agricultural water served by the supplier that is subtracted from its total potable water production.

(2) Submitting any information pursuant to subdivision (e)(1)(B) or (C) of this section that is found to be materially false by the board is a violation of this regulation, punishable by civil liability of up to five hundred dollars (\$500) for each day in which the violation occurs. Every day that the error goes uncorrected constitutes a separate violation. Civil liability for the violation is in addition to, and does not supersede or limit, any other remedies, civil or criminal.

(f)(1) To prevent waste and unreasonable use of water and to promote water conservation, each distributor of a public water supply that is not an urban water supplier shall take one or more of the following actions:

(A) Limit outdoor irrigation of ornamental landscapes or turf with potable water by the persons it serves to no more than two days per week; or

(B) Reduce by 25 percent reduction its total potable water production relative to the amount produced in 2013.

(2) Each distributor of a public water supply that is not an urban water supplier shall submit a report by December 15, 2015, on a form provided by the Board, that either confirms compliance with subdivision (f)(1)(A) or identifies total potable water production, by month, from June through November, 2015, and total potable water production, by month, for June through November 2013.

Authority: Section 1058.5, Water Code.

References: Cal. Const., Art., X § 2; Sections 102, 104, 105, 275, 350, 1846, 10617 and 10632, Water Code; *Light v. State Water Resources Control Board* (2014) 226 Cal.App.4th 1463.

Sec. 866. Additional Conservation Tools.

(a)(1) To prevent the waste and unreasonable use of water and to promote conservation, when a water supplier does not meet its conservation standard required by section 865 the Executive Director, or the Executive Director's designee, may issue conservation orders requiring additional actions by the supplier to come into compliance with its conservation standard.

(2) A decision or order issued under this article by the board or an officer or employee of the board is subject to reconsideration under article 2 (commencing with section 1122) of chapter 4 of part 1 of division 2 of the California Water Code.

(b) The Executive Director, or his designee, may issue an informational order requiring water suppliers, or commercial, industrial or institutional properties that receive any portion of their supply from a source other than a water supplier subject to section 865, to submit additional information relating to water production, water use or water conservation. The failure to provide the information requested within 30 days or any additional time extension granted is a violation subject to civil liability of up to \$500 per day for each day the violation continues pursuant to Water Code section 1846.

Authority: Section 1058.5, Water Code.

References: Cal. Const., Art., X § 2; Sections 100, 102, 104, 105, 174, 186, 187, 275, 350, 1051, 1122, 1123, 1825, 1846, 10617 and 10632, Water Code; *Light v. State Water Resources Control Board* (2014) 226 Cal.App.4th 1463.

RESOLUTION NO.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF VERNON DECLARING A PHASE II WATER SUPPLY SHORTAGE PURSUANT TO SECTION 25.104 OF THE VERNON MUNICIPAL CODE

WHEREAS, in response to persistent drought conditions in the State of California, on July 15, 2014, the State Water Resources Control Board ("SWRCB") approved Resolution No. 2014-0038 that adopted California Code of Regulations, Title 23, Sections 863, 864, and 865 (the "Regulations"); and

WHEREAS, on May 5, 2015, the SWRCB approved Resolution No. 2015-0032 establishing further restrictions on potable water use in response to California's ongoing drought; and

WHEREAS, by memorandum dated June 2, 2015, the Director of Public Works, Water and Development Services has recommended the City Council declare a Phase II Water Supply Shortage pursuant to Vernon Municipal Code Section 25.104; except that provision (a) be modified to permit watering of landscapes to two days a week all year and provision (g), which requires mandatory water reductions, not be required at this time; and

WHEREAS, the City Council of the City of Vernon desires to declare a Phase II Water Supply Shortage.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF VERNON AS FOLLOWS:

SECTION 1: The City Council of the City of Vernon hereby finds and determines that the above recitals are true and correct.

SECTION 2: The City Council of the City of Vernon finds that this action is exempt under the California Environmental Quality Act (CEQA), in accordance with Section 15061(b)(3), the general rule

that CEQA only applies to projects that may have a significant effect on the environment; and (b) Section 15307, because it is an action taken by a regulatory agency, as authorized by state law, to assure the "maintenance, restoration, or enhancement" of natural resources and includes procedures to protect the environment.

SECTION 3: The City Council of the City of Vernon hereby declares a Phase II Water Supply Shortage pursuant to Section 25.104 of the Vernon Municipal Code except that section (a) be modified to read as follows: "(a) *Watering days:* Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to two (2) days per week on a schedule established and posted by the City. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip irrigation zones systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering by hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system. In addition, watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited between the hours of 6:00 a.m. and 6:00 p.m." Also excepting section (g) in its entirety, which requires mandatory water reductions.

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SECTION 4: The City Clerk, or Deputy City Clerk, of the City of Vernon shall certify to the passage, approval and adoption of this resolution, and the City Clerk, or Deputy City Clerk, of the City of Vernon shall cause this resolution and the City Clerk's, or Deputy City Clerk's, certification to be entered in the File of Resolutions of the Council of this City.

APPROVED AND ADOPTED this 2nd day of June, 2015.

Name: _____

Title: Mayor / Mayor Pro-Tem

ATTEST:

City Clerk / Deputy City Clerk

APPROVED AS TO FORM:



Brian Byun, Deputy City Attorney

STATE OF CALIFORNIA)
) ss
COUNTY OF LOS ANGELES)

I, _____, City Clerk / Deputy City Clerk of the City of Vernon, do hereby certify that the foregoing Resolution, being Resolution No. _____, was duly passed, approved and adopted by the City Council of the City of Vernon at a regular meeting of the City Council duly held on Tuesday, June 2, 2015, and thereafter was duly signed by the Mayor or Mayor Pro-Tem of the City of Vernon.

Executed this ____ day of June, 2015, at Vernon, California.

City Clerk / Deputy City Clerk

(SEAL)

City of Vernon

Samuel Kevin Wilson, Director of Public Works, Water & Development Services
4305 Santa Fe Ave., Vernon, CA 90058
(323) 583-8811 FAX (323) 826-1435



June 4, 2015

NOTICE OF PHASE II WATER SUPPLY SHORTAGE

Due to continued drought conditions in the State of California, the Vernon City Council declared a Phase II Water Supply Shortage, pursuant to Vernon Municipal Code 25.104, at its June 2, 2015 meeting. The following water conservation requirements apply during a declared Phase II Water Supply Shortage and are effective immediately:

1. Limits on watering days: Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to two (2) times per week on a schedule established and posted by the City. **The City has determined that irrigation of landscaped areas may only be performed on Mondays and Thursdays.** Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited between the hours of 6:00 a.m. and 6:00 p.m. Pacific Standard Time. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.
2. Obligation to fix leaks, breaks or malfunctions: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by the City unless other arrangements are made with the City.
3. Limits on washing: Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not, is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a recirculating water system to capture or reuse water.

In addition, Vernon Municipal Code 25.101, "General Prohibition," provides for water conservation requirements including, but not limited to watering durations of no more than fifteen (15) minutes watering per day per station; excessive water or flow runoff, and washing down hard or paved surfaces except to maintain sanitary conditions. Vernon Municipal Code Section 1.8, "General Penalty; Continuing Violations," allows for fines of up to \$500 per violation for repeat offenders. Additional information on Vernon Municipal Code Sections 1.8, 25.101 and 25.104 are available online at www.cityofvernon.org.

For information on water conservation tips, please go to www.saveourh2o.org, or www.bewaterwise.com. If you have any questions or concerns as they relate to the above-mentioned conservation measures, please contact Scott B. Rigg of my staff by phone at (323) 583-8811 extension 279 or by email at srigg@ci.vernon.ca.us.

Sincerely,

Samuel Kevin Wilson, P.E.

Director of Public Works, Water and Development Services

June 4, 2015

AVISO DE LA FASE 2 DE LA ESCASEZ DE ABASTECIMIENTO DE AGUA

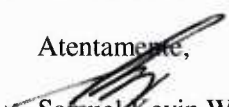
Debido a la persistencia de la sequía en el estado de California, en la reunión del 2 de Junio del 2015, el Consejo de la Ciudad de Vernon declaró efectiva la Fase 2 de la escasez de abastecimiento de agua, con conformidad a la Sección 25.103 del Código Municipal de la Ciudad de Vernon. Los siguientes requisitos de conservación de agua se aplicarán durante la vigencia de la Fase 2 de la escasez de abastecimiento de agua y serán efectivos inmediatamente:

1. Límites en los días de riego: riego o irrigación del césped, paisaje u otra área con vegetación con agua potable se limita a dos (2) veces por semana en un horario establecido y publicado por el Ayuntamiento. **La Ciudad ha determinado que el riego de las zonas ajardinadas sólo puede llevarse a cabo los Lunes y Jueves.** Riego o irrigación del césped, paisaje u otra área con vegetación con agua potable está prohibida entre las horas de 6:00 am y 6:00 pm, hora del Pacífico. Esta disposición no se aplica a zonas de riego u otra área con vegetación que utilizan exclusivamente sistemas de riego de goteo con flujo muy bajos que no producen más de dos (2) galones de agua por hora. Esta disposición tampoco se aplica para el riego mediante el uso de un cubeta de mano o recipiente similar, una manguera de mano equipada con un cierre de boquilla o dispositivo de agua de cierre automático, o por períodos muy cortos de tiempo con el propósito de ajustar o reparar un sistema de riego.
2. Obligación de reparar fugas, roturas o averías: Todas las fugas, roturas u otros fallos en el sistema de plomería o distribución del uso del agua debe ser reparado dentro de las cuarenta y ocho (48) horas siguientes a la notificación por parte del Ayuntamiento al menos que se hagan otros arreglos con el Ayuntamiento de la Ciudad.
3. Límites para lavar vehículos: Usar agua para lavar o limpiar vehículos incluyendo pero no limitado a automóviles, camiones de carga, camionetas van, autobuses de pasajeros, motocicletas, lanchas, o remolques, motorizados o sin motor, es totalmente prohibido con la excepción del uso de una cubeta de mano o recipiente similar, una manguera de mano equipada con un cierre de boquilla o dispositivo de agua de cierre automático, el uso de un sistema de lavado de alta presión y bajo volumen o el uso de establecimientos de autolavado comercial que usen un sistema de recirculación de agua para capturar o reusar agua.

Además, la Sección 25.101 del Código Municipal de la Ciudad de Vernon, "Prohibición general", establece los requisitos de conservación del agua, incluyendo, pero no limitado a la duración de riego de no más de quince (15) minutos de riego por día por estación; uso excesivo de agua o el escurrimiento de flujo, y el lavado de mano dura o superficies pavimentadas, excepto para mantener las condiciones sanitarias. La Sección 1.8 del Código Municipal de la Ciudad de Vernon, "Pena General; Continuando Violaciones," permite multas de hasta \$ 500 por violación a los infractores reincidentes. Información adicional sobre las secciones 1.8, 25.101 y 25.103 del Código Municipal de la Ciudad de Vernon se encuentran disponibles en línea en www.cityofvernon.org.

Para obtener información sobre consejos de conservación de agua, por favor vaya a www.saveourh2o.org o www.bewaterwise.com. Si tiene cualquier pregunta o preocupación en relación con las medidas de conservación mencionadas, por favor póngase en contacto con Scott B. Rigg de mi personal por teléfono al (323) 583-8811 extensión 279 o por correo electrónico a srigg@ci.vernon.ca.

Atentamente,


Samuel Kevin Wilson, P.E.

Director de Obras Públicas, Agua y Servicios de Desarrollo

Appendix P

CII Water Audits



**PUBLIC WORKS, WATER AND DEVELOPMENT
SERVICES DEPARTMENT
MEMORANDUM**

TO: A.J. Wilson, Interim City Administrator

FROM: Scott B. Rigg, Public Works and Water Superintendent *SR*

DATE: February 3, 2016

SUBJECT: Authorization to Issue Notice of Available Water Audits for Industrial Customers

The Department of Public Works, Water and Development Services is seeking authorization to send a Notice of Available Water Audits to the City of Vernon's top 25 water users. A draft of the subject letter is herein attached.

Background

On January 17, 2014, Governor Edmund G. Brown Jr. issued Proclamation No. 1-17-2014, declaring a State of Emergency to exist in California under the Emergency Services Act due to severe drought conditions. In response to the Proclamation, the City of Vernon ("City") declared a Phase I Water Supply Shortage. On May 5, 2015, the State Water Board adopted Resolution No. 2015-0032, an Emergency Regulation for Statewide Urban Water Conservation. The Resolution requires that urban water suppliers prepare and submit to the State Water Board by the 15th of each month a monitoring report detailing the total amount of potable water produced compared to the amount produced in the same calendar month in 2013. The State Board also assigned a conservation number to each water supplier. The City was assigned an eight percent (8%) conservation number. That means that the City will have to achieve, at minimum, an eight percent (8%) reduction in water use from the amount produced in the same calendar month in 2013. The results of a purveyor's water use are calculated on a cumulative basis. The reporting was made mandatory by the State Board in June of 2015. The City commenced the reporting in accordance with the State Board requirements. In review of the cumulative reporting for the months of June and July, the total savings equated to just 1.440%. This obviously fell short of the eight percent (8%) conservation goal. Much of this short-fall was a result of the City rehabilitating wells which requires extensive flushing. However, other factors could make the conservation goal hard to achieve especially if the drought regulations are extended by the State Board. For example, the City has minimal outdoor landscape areas making reductions in water use more difficult; and industrial customers typically run efficient operations as they are profit driven. With this information in hand, the City applied for Alternative Compliance through the State Board. The State Board approved the City's request on August 7, 2015. The Alternative Compliance requirements are attached for your review. One of the requirements of the Alternative Compliance is for the City to offer at least seven (7) water efficiency audits per-month. In this pursuit, the City solicited bids from qualified consultants to perform water audits for the top 25 water customers. The City

received two proposals from qualified consultants. The proposal costs were significantly higher than the City anticipated. For example, the average cost to perform commercial audit would be approximately \$2,000.00 per audit or \$50,000.00 for the top 25 customers. Obviously, this is not a cost effective methodology in terms of reducing the water consumption within the confines of the City. As an alternative to this, the City proposed to the State Board that it prepare a boilerplate letter to its top 25 water customers that would illustrate the potential benefits of a water audit including reduced water demand and wastewater discharges; benchmarking, and funding opportunities. The State Board approved this method of compliance.

Enclosures

Notice of Available Water Audits for Industrial Businesses



COMMUNITY SERVICES & WATER DEPARTMENT
Samuel Kevin Wilson, Director of Community Services & Water
4305 Santa Fe Avenue, Vernon, California 90058
Telephone (323) 583-8811 Fax (323) 826-1435

February 8, 2016

NOTICE OF AVAILABLE WATER AUDITS FOR INDUSTRIAL BUSINESSES


The City of Vernon (City) declared a Phase II Water Supply Shortage on June 2, 2015. As part of its ongoing conservation efforts, the City researched strategies that industrial customers can use to conserve precious water supplies and reduce operating costs at the same time. Water audits are an effective method to account for all water usage within your facility in order to identify opportunities to improve water use efficiency. Benefits from implementing of Best Management Practices (BMP) may include lower utility costs, energy savings and reduced process costs. It will also provide information helpful in the implementation of related Industrial BMP's such as Water Waste Reduction BMP, the Industrial Submetering BMP, Cooling Tower BMP, and the Industrial Alternative Sources and Reuse of Process Water.

Moreover, facility water audits include accurate measurement of all water entering the facility, the inventory and calculation of all on-site water uses, any unused water sources or waste streams that may be available, calculation of water related costs and identification of potential water efficiency measures. The information derived from the water audit can be used to develop a comprehensive conservation program to implement specific water saving measures throughout your facility.

There are a number of consulting firms that provide water audits in the Greater Los Angeles region. Although the City cannot recommend a specific consultant, it can assist you in identifying a pool of consultants who perform such work. The cost of water audits will vary among consultants and will also depend on the size of your facility.

If you would like more information regarding the availability of water audits for industrial water businesses, please contact me by email at srigg@ci.vernon.ca.us or by phone at (323) 583-8811 extension 279.

Sincerely,


Scott B. Rigg, MPA
Public Works and Water Superintendent

Exclusively Industrial



COMMUNITY SERVICES & WATER DEPARTMENT
Samuel Kevin Wilson, Director of Community Services & Water
4305 Santa Fe Avenue, Vernon, California 90058
Telephone (323) 583-8811 Fax (323) 826-1435

January 14, 2016

Dr. Matthew S. Buffleben, PE
Chief, Special Investigations Unit
Office of Enforcement
State Water Resources Control Board

Re: December 2015 Report – Alternative Compliance

Mr. Buffleben:

The City of Vernon (City), in its continued effort to reduce water usage, has provided its field staff with drought awareness training. As such, field staff has been directed to be more cognizant of potential water-wasters and report and/or council identified wasters to the principles of sound water conservation practices. The City also performed an in-house audit of its facilities to ensure Best Management Practices are adhered to. This audit extended to City Hall, Miscellaneous City Buildings, and four (4) fire stations. Additionally, a meeting with the City's landscape contractor to review their practices in terms of irrigating landscape and to discuss strategies to reduce water dependence. The City, as a result of this meeting, may consider replacing existing plant with a more drought resistant variety.

As you are aware, the City forwarded to the State Water Resources Control Board a draft letter to its Top 25 Water Customers for your review. The letter, upon your approval, will be sent to the above-mentioned customers and included on the City's website. I will personally contact the Top 25 Water Customers prior to sending the subject letter to discuss available programs in detail.

Exclusively Industrial

The City has been working closely with CBMWD in terms of identifying industrial customers who may have taken advantage of available rebates reflected on the City's website. To date, other than our previous correspondence regarding Farmer John, no City industrial customers have participated in rebate programs.

Sincerely,

A handwritten signature in black ink, appearing to read "S. B. Rigg".

Scott B. Rigg, MPA
Public Works and Water Superintendent



COMMUNITY SERVICES & WATER DEPARTMENT
Samuel Kevin Wilson, Director of Community Services & Water
4305 Santa Fe Avenue, Vernon, California 90058
Telephone (323) 583-8811 Fax (323) 826-1435

February 11, 2016

Dr. Matthew S. Buffleben, PE
Chief, Special Investigations Unit
Office of Enforcement
State Water Resources Control Board

Re: January 2016 Report – Alternative Compliance

Mr. Buffleben:

The City of Vernon (City), in effort to conserve precious water supplies, recently issued letters to its top 25 water consumers advising them of available water audits for industrial businesses. The City is in the process of following up with the subject businesses by phone to identify conservation strategies and long-term plans to operate in a more efficient and effective fashion. Moreover, the City's conservation strategies appear to be paying dividends. For the month of January 2016 the City realized a nineteen percent (19%) reduction in overall water production as compared with January of 2013. This far exceeds the established "conservation number" of eight percent (8%). Additionally, the City's cumulative average is now at eight percent (8%). Thus, the City is now meeting its conservation number.

The City has been working diligently with CBMWD in terms of identifying industrial customers who may have taken advantage of available rebates reflected on the City's website. To date, other than our previous correspondence regarding Farmer John, no City industrial customers have participated in rebate programs.

Sincerely,

Scott B. Rigg, MPA
Public Works and Water Superintendent

Enclosures

Exclusively Industrial

**WATER CONSERVATION STANDARD
SWRCB**

MONTH	2013 WATER PRODUCTION (AF)	2015 WATER PRODUCTION (AF)	SAVINGS ACHIEVED GOAL (8%)	CUMMULATIVE SAVINGS
Jun-15	659.25	699.45	-6%	-6%
Jul-15	691.88	632.16	9%	1.440%
Aug-15	649.4	610.69	5.96	2.91
Sep-15	621.87	606.64	2.44	2.8
Oct-15	673.13	632.26	6.07	3.46
Nov-15	628.43	528.13	16	5.78
Dec-15	610.67	534.45	13	6.41
Jan-16	685.14	554.39	19	8.07
Feb-16				

5219.77

4798.17

1.087866833



PUBLIC WORKS, WATER & DEVELOPMENT SERVICES

4305 Santa Fe Avenue, Vernon, California 90058
Telephone (323) 583-8811 Fax (323) 826-1435

March 14, 2016

Dr. Matthew S. Buffleben, PE
Chief, Special Investigations Unit
Office of Enforcement
State Water Resources Control Board

Re: February 2016 Report – Alternative Compliance

Mr. Buffleben:

As you will recall in the January 2016 Alternative Compliance Report, the City of Vernon (City) issued letters to its top 25 water consumers advising them of available water audits for industrial businesses. The City, to date, received one inquiry from a Mark House of Millennium Products, Inc. Mr. House was seeking contact information regarding various consulting firms who specialize in water and energy audits. The City provided Mr. House with the requested contact information. Moreover, the City's conservation strategies appear to be paying dividends. For the month of February 2016, the City realized a fifteen percent (15%) reduction in overall water production as compared with February of 2013. This far exceeds the established "conservation number" of eight percent (8%). Additionally, the City's cumulative average is now at eight point eight six percent (8.86%). Thus, the City is now meeting its conservation number.

The City has been working diligently with CBMWD in terms of identifying industrial customers who may have taken advantage of available rebates reflected on the City's website. To date, other than our previous correspondence regarding Farmer John, no City industrial customers have participated in rebate programs.

Sincerely,

Scott B. Rigg, MPA
Public Works and Water Superintendent
Enclosures

Exclusively Industrial

Rigg, Scott

From: Mark House <mark@drinkgts.com>
Sent: Thursday, March 10, 2016 1:46 PM
To: Rigg, Scott
Subject: Water Audits and Recycling

Scott,

Nice to talk to you regarding water audits. We will look into this opportunity with the information you can supply. In addition, I'm looking for a way to recycle used tea bags. This is all biodegradable and hopefully can go somewhere other than a landfill.

If you can help me network with both a water audit and recycling tea bags that would be great.

I really appreciate your help.

Thanks.

Mark House
VP Operations
Millennium Products, Inc.
www.GTSkombucha.com
[310-499-8762](tel:310-499-8762)





WaterWise Consulting, Inc.

"Conserving our natural resources for future generations"

October 22, 2015

City of Vernon
Attn: Scott Rigg, Public Works and Water Superintendent
4305 S. Santa Fe Ave.
Vernon, CA 90058

Re: CII Water Evaluations

Dear Mr. Rigg,

WaterWise Consulting, Inc. (WaterWise) is proud to submit its proposal to the City of Vernon (City) to provide Commercial, Industrial and Institutional (CII) Water Use Evaluations. WaterWise has been involved with managing and implementing water conservation programs for fourteen (14) years and has built a wealth of knowledge and skills that are unmatched in the industry.

WaterWise has had the opportunity to successfully manage a wide variety of multi-faceted programs. This has enabled it to not only utilize its technical expertise in water conservation, but also gain professional experience and knowledge in successful program management. WaterWise has successfully conducted over thirty thousand residential and commercial evaluations focusing on customer service, accurate reporting, and technical expertise. WaterWise has also installed over thirty thousand high efficiency spray nozzles and five hundred weather based irrigation controllers. In addition, WaterWise has successfully developed, implemented, and managed various landscape, turf, and irrigation device rebate programs.

Throughout the proposal, WaterWise will reveal its familiarity with the scope of work required under this Request for Proposal (RFP) and its capability of performing timely and quality work to achieve the objectives of the City.

WaterWise appreciates this opportunity and looks forward to working with City.

If you have any questions, please contact me using the information provided below:

Sincerely,

Ajay Dhawan

Ajay Dhawan
President
1147 S. Grand Ave.
Glendora, CA 91740
(626) 335-7888
adhawan@waterwise-consulting.com

Fee Schedule:

Survey Type	Fee
Residential Water Survey (RWS)	\$175.00 Per Survey
Large Landscape Survey (includes up to 32 stations)	\$1,500.00 Per Survey
Each Additional Station	\$20.00
Commercial Survey	\$2,000.00 Per Survey
Institutional Survey	\$2,500.00 Per Survey

Hourly Rates	Fee
Project Manager	\$125 per hour
Project Supervisor	\$75 per hour
Graphic Design	\$75 per hour
Administration	\$35 per hour

*Payment is due within 30 days from the date submitted to the Program Manager (Lifan Xu). WaterWise understands that there is a cut off date to submit invoices for prompt payment based on the City's Check Processing Schedule.

Rigg, Scott

From: Abel Favela <AFavela@rhainc.com>
Sent: Monday, October 19, 2015 2:40 PM
To: Rigg, Scott
Cc: Serrano, Anthony; Gabriel Peredo
Subject: 25 Customer
Attachments: Top 25 Water Customers Vernon Pricing V2.xlsx

Scot,

Attached you will find a pricing calculator that we put together for the top 25 water customers in Vernon.

- The square footages that we could not find online was estimated using Google Maps.
- Based on the three Tiers, the total amount to audit all 25 customers comes out to
\$ 276,295.00

Abel Favela



PUBLIC WORKS, WATER & DEVELOPMENT SERVICES

4305 Santa Fe Avenue, Vernon, California 90058
Telephone (323) 583-8811 Fax (323) 826-1435

April 15, 2016

Dr. Matthew S. Buffleben, PE
Chief, Special Investigations Unit
Office of Enforcement
State Water Resources Control Board

Re: March 2016 Report – Alternative Compliance

Mr. Buffleben:

As previously noted in the February 2016 Alternative Compliance Report, the City of Vernon (City) issued letters to its top 25 water consumers advising them of available water audits for industrial businesses. The City, to date, has received one inquiry from a Mark House of Millennium Products, Inc. Mr. House was seeking contact information regarding various consulting firms who specialize in water and energy audits. The City provided Mr. House with the requested contact information. Moreover, the City's conservation strategies appear to be paying dividends. For the month of March 2016, the City realized an 8.22 percent reduction in overall water production as compared with March of 2013. This exceeds the established "conservation number" of eight percent (8%). Additionally, the City's cumulative average is now at eight point eight six percent (9.57%). Thus, the City is currently meeting its conservation number.

The City has been working diligently with CBMWD in terms of identifying industrial customers who may have taken advantage of available rebates reflected on the City's website. To date, other than our previous correspondence regarding Farmer John, no City industrial customers have participated in rebate programs. Additionally, the City will be contacting the Metropolitan Water District to seek grant funding for industrial water audits. Grant funding will allow the City to perform in-depth industrial audits, and further explore the potential of water and energy savings and recycled water opportunities.

Sincerely,

Scott B. Rigg, MPA
Public Works and Water Superintendent
Enclosures

Exclusively Industrial

Appendix Q

Notice of Public Hearing

CALIFORNIA NEWSPAPER SERVICE BUREAU

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LISA POPE
CITY OF VERNON CITY CLERK
4305 SANTA FE AVE
VERNON, CA 90058

COPY OF NOTICE

Notice Type: GPN GOVT PUBLIC NOTICE

Ad Description

Notice of Public Hearing - 2020 Urban Water Management Plan

To the right is a copy of the notice you sent to us for publication in the HUNTINGTON PARK BULLETIN. Please read this notice carefully and call us with any corrections. The Proof of Publication will be filed with the County Clerk, if required, and mailed to you after the last date below. Publication date(s) for this notice is (are):

05/20/2021 , 05/27/2021

An invoice will be sent after the last date of publication. If you prepaid this order in full, you will not receive an invoice.

PRE# 3473148

NOTICE OF CITY COUNCIL PUBLIC HEARING

The City Council of the City of Vernon will conduct a public hearing, which you may attend, at Vernon City Hall, City Council Chamber, 4305 Santa Fe Avenue, Vernon, CA 90058, or via Zoom Webinar at <http://www.cityofvernon.org/webinar-cc>, in accordance with Governor Newsom's Executive Order N-29-20 on **Tuesday, June 15, 2021, at 9:00 a.m.** (or as soon thereafter as the matter can be heard), to:

Consider Adoption of the 2020 Urban Water Management Plan (UWMP)

The Draft 2020 UWMP will be available for public review on the City's website at www.cityofvernon.org. A hard copy will also be available for public review during normal business hours at the Customer Service counter located at City Hall, 4305 Santa Fe Avenue, Vernon, CA 90058, between the hours of 7:00 a.m. and 5:30 p.m. Monday through Thursday.

Please send your comments or questions to:
Joanna Moreno, Assistant Civil Engineer
City of Vernon Public Utilities Department
4305 Santa Fe Avenue, Vernon, CA 90058
(323) 583-8811 Ext. 888 Email: jmoreno@ci.vernon.ca.us

PROPOSED CEQA FINDING: Staff will recommend that the City Council find that the proposed action is exempt from California Environmental Quality Act (CEQA) review, in accordance with CEQA Guidelines § 15061(b)(3), the general rule that CEQA only applies to activities that may have a significant effect on the environment, because the 2020 Urban Water Management Plan (UWMP) is merely an update to the 2015 UWMP.

If you challenge the adoption of this plan or the CEQA documentation or finding, or any provision thereof in Court, you may be limited to raising only those issues you or someone else raised at the hearing described in this notice or in written correspondence delivered to the City of Vernon at, or prior to, the meeting.

In compliance with the Americans with Disabilities Act (ADA), if you need special assistance to participate in the meeting, please contact the Office of the City Clerk at (323) 583-8811 ext. 546.

The hearing may be continued, adjourned, or cancelled and rescheduled to a stated time and place without further notice of a public hearing.

Dated: May 17, 2021

/s/
Lisa Pope, City Clerk

5/20, 5/27/21
PRE-3473148#
HUNTINGTON PARK BULLETIN





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Water Division



UPDATE May 14, 2020

For customers that have been closed for a prolonged period of time, please review the Guidance Documents and Checklist below released by the EPA. The guidance document and checklist helps assist building owners and managers in addressing water stagnation following extended closures due to the COVID-19 response.

- [Guidance Document - Maintaining Building Water Quality](#)
- [Checklist for Maintaining Building Water](#)

- [Public Review Draft 2020 Urban Water Management Plan](#)
- [2019 VERNON WATER RATE STUDY](#)
- [2019 ANNUAL WATER QUALITY REPORT](#)
- [NOTICE OF PHASE II WATER SUPPLY SHORTAGE](#)

- [NOTICE OF PHASE II PRESENTATION](#)
- [NOTICE OF VOLUMETRIC CHARGE PASS THROUGH ADJUSTMENT](#)
- [CERTIFICATION OF SELF-CERTIFIED CONSERVATION STANDARD](#)
- [WATER SUPPLY RELIABILITY CERTIFICATION FORM: WORKSHEET 1](#)
- [WATER SUPPLY RELIABILITY CERTIFICATION FORM: WORKSHEET 2](#)
- [MISCELLANEOUS CHARGES](#)
- [POLICY GOVERNING THE ACCEPTANCE AND TUBULATION OF UTILITY RATE](#)

Governor of the State of California declares drought. [Click here](#) for water saving tips. Please do your part. Click on images below to enlarge



[Vernon Water Rates](#)
[Water Service Area](#)
[Index](#)
[City Map](#)
[Customer Evaluation](#)
[2010 Urban](#)
[Management Plan](#)
[Volume 1](#)
[2010 Urban](#)
[Management Plan](#)
[Volume 2 &](#)
[Appendices](#)
[Landscape](#)
[Ordinance](#)

The Water Department provides potable drinking water for the City at some of the lowest rates in the region, maintaining a system of wells, reservoirs and piping systems. The division oversees the administration and maintenance of this system and the construction of new water service.

The Water Department manages the City's state-of-the-art water system, serving more than 1,000 customers and distributing approximately 2.8 billion gallons of water annually. Known for its high-quality and safety, Vernon's water system was awarded the highest possible rating by the Insurance Service Organization, a leading analyst of government utilities. The system also offers some of the lowest water rates in the area.

The Vernon water distribution system has an average pressure of about 75 pounds per square inch, and consists of 243,624 linear feet of pipe, eight wells, six ground-level reservoirs, one elevated tank and a below-ground reservoir. The system has a total storage capacity of 16.7 million gallons. In addition to Vernon's water system, the City has a direct connection to the Metropolitan Water District, which provides a supplemental source and emergency supply of water.

The Water Department's staff is responsible for constructing new service and maintaining the various components of the system, including wells, reservoirs and pipelines. The division produces annual public reports on water rates and quality. It also oversees the Urban Water Management Plan, a document that guides the City's long-term water strategy and holds contingency plans for water shortages.

The Vernon Water Department provides service for the majority of the City. Small areas in the northeast and southeast of the city are served by California Water Service and Maywood Mutual No. 3, respectively.

Follow Us



phone. 323 . 583 . 8811
address. 4305 S. Santa Fe Ave. Vernon, CA 90058
city hours. Monday through Thursday, 7:00am to 5:30pm



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Appendix R

Resolution of Adoption

RESOLUTION NO. 2021-18

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF VERNON
ADOPTING THE CITY OF VERNON 2020 URBAN WATER
MANAGEMENT PLAN

SECTION 1. Recitals.

- A. The Urban Water Management Planning Act ("Act"), (California Water Code Sec. 10610, et seq.) requires designated urban water suppliers to prepare and adopt an Urban Water Management Plan ("Plan"), and to update the Plan at least once every five years on or before July 1, in years ending in six and one.
- B. The Act applies to public and privately-owned water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or that supply more than 3,000 acre-feet of water annually.
- C. The City is an urban supplier of water within the scope of the Act and is required to prepare, adopt, and periodically update its Plan.
- D. On June 7, 2016, the City Council adopted Resolution No. 2016-26 approving and adopting the City's Plan.
- E. Pursuant to California Water Code Section 10621, the City has prepared an updated Plan in accordance with legal requirements and had undertaken certain coordination, public comment, and other procedures in relation to such Plan.
- F. Prior to adopting this Resolution, the City Council conducted a duly noticed public hearing in accordance with California Water Code Section 10642.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF VERNON AS FOLLOWS:

SECTION 2. The City Council of the City of Vernon hereby finds and determines that the above recitals are true and correct.

SECTION 3. The City Council of the City of Vernon finds that this action is exempt under the California Environmental Quality Act (CEQA) in accordance with Water Code Section 10652, which exempts the preparation and adoption of urban water management plans from CEQA requirements, and CEQA Guideline Section 15061(b)(3), the general rule that CEQA only applies to activities that may have a significant effect on the environment, because the plan referenced herein is merely an update of the existing 2015 Urban Water Management Plan.

SECTION 4. The City Council of the City of Vernon further finds that all persons have had the opportunity to be heard or to file written comments to the proposed Plan and, after due consideration of any and all evidence submitted at the public hearing, hereby adopts the City of Vernon 2020 Urban Water Management Plan, a copy of which is attached hereto as Exhibit A.

SECTION 5. The City Council of the City of Vernon hereby authorizes and directs the General Manager of the Public Utilities Department to implement the water conservation programs as detailed in the Plan and to carry out effective and equitable water conservation programs.

SECTION 6. The City Council of the City of Vernon hereby authorizes and directs the General Manager of the Public Utilities Department to submit a copy of the Plan within 30 days to the necessary parties in accordance with California Water Code Section 10644.

SECTION 7. The City Clerk shall certify the passage and adoption of this resolution and enter it into the book of original resolutions.

APPROVED AND ADOPTED this 15th day of June, 2021.

DocuSigned by:

Melissa Ybarra

C0A5DCE4B14F4FA...

MELISSA YBARRA, Mayor

ATTEST:

DocuSigned by:

Lisa Pope

LISA POPE, City Clerk
(seal)

APPROVED AS TO FORM:

DocuSigned by:

Arnold M. Alvarez-Glasman

C02D9C16E7A148A...

ARNOLD M. ALVAREZ-GLASMAN,
Interim City Attorney

I CERTIFY THAT THE FOREGOING RESOLUTION NO. 2021-18 was passed and adopted by the City Council of the City of Vernon at the Regular meeting on June 15, 2021 by the following vote:

AYES: 5 Council Members: Larios, Lopez, Merlo, Davis, Ybarra
NOES: 0
ABSENT: 0
ABSTAIN: 0

DocuSigned by:

Lisa Pope

9F43A1B6C2E44A8...

LISA POPE, City Clerk
(seal)

Appendix S

DWR UWMP Checklist for Completeness

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	§1.2
x	x	Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Executive Summary
x	x	Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	§2.2

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	§2.5.2
x	x	Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	§2.5.2 & Appendix Q
x		Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	§2.5.1

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
	*	Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	N/A
x	x	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	§3.1 – §3.6
x	x	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	§3.4
x	x	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	§3.5.1
x	x	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	§3.5.2
x	x	Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	§3.5.1
x	x	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	§3.6

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	§4.3.1
x	x	Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	§4.3.3 & Appendix J
x	x	Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System Water Use	§4.3.1 & Appendix A (Submittal Table 4-5)
x	x	Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	§4.3.1
x	optional	Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	§4.3.3 & Appendix J
x	optional	Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	§4.4
x	x	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	§4.5 & §7.2.1.1

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x		Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	§5.3 – §5.7
x		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	§5.8.1
	*	Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	N/A
x		Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	§5.8.2

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x		Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5-year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	§5.3.2 & §5.6
x		Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	§5.8 & Appendix A
x	x	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	§7.2.3
x	x	Sections 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, <i>including changes in supply due to climate change.</i>	System Supplies	§7.2.1

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	§6.2 – §6.8
x	x	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	§6.9
x	x	Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	§6.10
x	x	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	§6.3
x	x	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	§6.3.2 & Appendix H
x	x	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	§6.3.1

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	§6.3.2 & Appendix H
x	x	Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	§6.3
x	x	Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	§6.3.3
x	x	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	§6.10

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	§6.8
x	x	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	§6.6.4
x	x	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	§6.6.3
x	x	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	§6.6.4
x	x	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	§6.6.4, §6.6.5, & §6.10

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Section 6.2.5	10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	§6.6.6
x	x	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	§6.6.6
x	x	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	§6.7
x	x	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (Recycled Water)	§6.6.2
x	x	Section 6.2.8, Section 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	§6.9

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	§6.12 & Appendix T
x	x	Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	§7.2
x	x	Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	§7.2.4
x	x	Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	§7.2.3

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	§7.3
x	x	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	§7.3
x	x	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	§7.2.3 & §7.3
x	x	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	§7.3

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	§7.3
x	x	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Chapter 8 & Appendix K-M
x	x	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	§8.2
x	x	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	§8.11

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	§8.3
x	x	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	§8.3
x	x	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	§8.4

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	§8.4
x	x	Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	§8.5.1
x	x	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	§8.5.2
x	x	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	§8.5.3
x	x	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	§8.5.4

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	§8.5.7
x	x	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	§8.5.6
x	x	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	§8.6
x	x	Section 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	§8.6
x		Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	§8.7

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	§8.8
x	x	Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	§8.8
x	x	Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	§8.8
x	x	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	§8.9
x	x	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	§8.9

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x		Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought	Water Shortage Contingency Planning	§8.9
x		Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	§8.10
x		Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	§8.12
x	x	Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	§8.13 & §10.5

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	§8.13 & §10.6
	*	Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	N/A
x		Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	§9.4
x		Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	§10.4

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	§10.3.1 & Appendix D
x	x	Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	§10.5
x	x	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	§10.3.2, §10.4, & Appendix Q
x	x	Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	§10.3 & §10.4
x	x	Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	§10.4.2 & Appendix R

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	§10.5
x	x	Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	§10.5
x	x	Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	§10.5.1
x	x	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	§10.6

UWMP Checklist

Retail	Wholesale	Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	UWMP Location
x	x	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	§10.6
x	x	Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	N/A
x	x	Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	§10.7.2

Appendix T

Energy Intensity Analysis

Urban Water Supplier: City of Vernon

Water Delivery Product (If delivering more than one type of product use Table O-1C)

Retail Potable Deliveries

Table O-1A: Recommended Energy Reporting - Water Supply Process Approach

Enter Start Date for Reporting Period	1/1/2020		Urban Water Supplier Operational Control							
End Date	12/31/2020									
<input type="checkbox"/> Is upstream embedded in the values reported?			Water Management Process					Non-Consequential Hydropower (if applicable)		
Water Volume Units Used		Extract and Divert	Place into Storage	Conveyance	Treatment	Distribution	Total Utility	Hydropower	Net Utility	
Volume of Water Entering Process		AF	6,687				4,266	4266	4266	
Energy Consumed (kWh)		N/A	167,440,408				6,160,880	173601288	173601288	
Energy Intensity (kWh/vol.)		N/A	25039.7	0.0	0.0	0.0	1444.2	40694.2	40694.2	

Quantity of Self-Generated Renewable Energy

kWh

Data Quality (Estimate, Metered Data, Combination of Estimates and Metered Data)

Metered Data

Data Quality Narrative:

All energy and water volume data are metered.

Narrative:

Energy use in the water system falls into two categories: groundwater production and distribution. Wells discharge directly into the system with a portion of production used to fill storage. Water is pumped from storage into the system by booster pumps.

Urban Water Supplier:

City of Vernon

Table O-2: Recommended Energy Reporting - Wastewater & Recycled Water					
Enter Start Date for Reporting Period		Urban Water Supplier Operational Control			
End Date		Water Management Process			
<input type="checkbox"/> Is upstream embedded in the values reported?		Collection / Conveyance	Treatment	Discharge / Distribution	Total
Volume of Water Units Used		AF			
Volume of Wastewater Entering Process (volume units selected above)					0
Wastewater Energy Consumed (kWh)					0
Wastewater Energy Intensity (kWh/volume converted to MG)		0.0	0.0	0.0	0.0
Volume of Recycled Water Entering Process (volume units selected above)					0
Recycled Water Energy Consumed (kWh)					0
Recycled Water Energy Intensity (kWh/volume converted to MG)		0.0	0.0	0.0	0.0

Quantity of Self-Generated Renewable Energy related to recycled water and wastewater operationskWh**Data Quality** (Estimate, Metered Data, Combination of Estimates and Metered Data)**Data Quality Narrative:****Narrative:**

N/A. Wastewater and recycled water within the City of Vernon are handled by the Los Angeles County Sanitation Districts and CBMWD, respectively.

Appendix U

Natural Hazard Mitigation Plan

City of Vernon

Natural Hazards Mitigation Plan

October 20, 2004



Prepared under contract with:

*Emergency Planning Consultants
San Diego, California
Carolyn J. Harshman, President*

Special Recognition

The Disaster Management Area Coordinators (DMAC) of Los Angeles County prepared a plan template that was utilized by the City of Vernon in preparing this Natural Hazards Mitigation Plan. The City extends special recognition to DMAC Executive Director Michael Martinet for his editing contribution to the Hazard-Specific Sections of the Template. The DMAC template was based on the Mitigation Plan from Clackamas County, Oregon. The City is grateful to DMAC and the Clackamas County Natural Hazards Mitigation Committee for their contributions to this project.

Special Thanks

Hazard Mitigation Planning Team:
City of Vernon

- Kevin Wilson, Community Services & Water Department
- Sherwood Natsuhara, Community Services & Water Department
- Sergio Canales, Planning Division
- Manuel Garcia, Light and Power Department
- Carlos Fandino, Light and Power Department
- Carol Childers, Light and Power Department
- Lewis Pozzebon, Environmental Health
- Rory Moore, Fire Department
- Dave Kimes, Fire Department
- Sol Benudiz, Police Department
- Danny Calleros, Police Department

Office of Disaster Management, Area E: Fan Abel, Coordinator

Acknowledgements

City of Vernon City Council

- Leonis C. Malburg, Mayor
- Thomas A. Ybarra, Mayor Pro-Tem
- Hilario Gonzales, Council Member
- William Davis, Council Member
- Michael McCormick, Council Member

Mapping

Other than Internet-sourced maps, the City of Vernon provided all of the maps included in this plan.

Consulting Services

Project Management and Planning Services for this project were provided under contract with Emergency Planning Consultants -

Project Management Services:	Carolyn J. Harshman, President
Planning Services:	Carolyn J. Harshman, President

List of Natural Hazards Mitigation Plan Tables, Maps, and Photos

	Type of Table, Map, or Photo	Section of the Plan
Map 1-1	Base Map of City of Vernon	Section 1: Introduction
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Note: The maps in this plan were provided by the City of Vernon or were acquired from public Internet sources. Care was taken in the creation of these maps, but they are provided "as is". The City of Vernon cannot accept any responsibility for any errors, omissions or positional accuracy, and therefore, there are no warranties that accompany these products (the maps). Although information from land surveys may have been used in the creation of these products, in no way does this product represent or constitute a land survey. Users are cautioned to field verify information on this product before making any decisions.

City of Vernon Natural Hazards Mitigation Plan

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Executive Summary: Hazard Mitigation Action Plan

The City of Vernon Natural Hazards Mitigation Plan includes resources and information to assist City residents, public and private sector organizations, and others interested in participating in planning for natural hazards. The mitigation plan provides a list of activities that may assist City of Vernon in reducing risk and preventing loss from future natural hazard events. The action items address multi-hazard issues, as well as activities for earthquakes, flooding, and windstorms.

How is the Plan Organized?

The Mitigation Plan contains a Mitigation Actions Matrix, background on the purpose and methodology used to develop the mitigation plan, a profile of City of Vernon, sections on three natural hazards that occur within the City, and a number of appendices. All of the sections are described in detail in Section 1, Introduction.

Who Participated in Developing the Plan?

The City of Vernon Natural Hazards Mitigation Plan is the result of a collaborative planning effort between City of Vernon citizens, public agencies, non-profit organizations, the private sector, and regional and state organizations. Public participation played a key role in development of goals and action items. Public outreach activities were conducted to include City of Vernon businesses and residents in plan development. A project Planning Team guided the process of developing the plan.

The Hazard Mitigation Planning Team was comprised of the following representatives:

City of Vernon	Kevin Wilson, Community Services & Water Department
	Sherwood Natsuhara, Community Services & Water Department
	Sergio Canales, Planning Division
	Manuel Garcia, Light and Power Department
	Carlos Fandino, Light and Power Department
	Carol Childers, Light and Power Department
	Lewis Pozzebon, Environmental Health
	Rory Moore, Fire Department
	Dave Kimes, Fire Department
	Sol Benudiz, Police Department
	Danny Calleros, Police Department

	Martha Valenzuela, Finance Department
Emergency Planning Consultants	Carolyn J. Harshman, President

What is the Plan Mission?

The mission of the City of Vernon Natural Hazards Mitigation Plan is to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from natural hazards. This can be achieved by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide the City towards building a safer, more sustainable community.

What are the Plan Goals?

The plan goals describe the overall direction that City of Vernon agencies, organizations, and citizens can take to work toward mitigating risk from natural hazards. The goals are stepping-stones between the broad direction of the mission statement and the specific recommendations outlined in the action items.

Protect Life and Property

Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to losses from natural hazards.

Reduce losses and repetitive damages for chronic hazard events while promoting insurance coverage for catastrophic hazards.

Increase Public Awareness

Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.

Enhance Natural Systems

Balance land use planning with natural hazard mitigation to protect life, property, and the environment.

Preserve, rehabilitate, and enhance natural systems to serve natural hazard mitigation functions.

Encourage Partnerships and Implementation

Strengthen communication and coordinate participation among and within public agencies, citizens, non-profit organizations, business, and industry to gain a vested interest in implementation.

Encourage leadership within public and private sector organizations to prioritize and implement local hazard mitigation activities.

Maximize Emergency Services

Establish policy to ensure mitigation projects for critical facilities, services, and infrastructure.

Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry.

Coordinate and integrate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

How are the Action Items Organized?

The action items are a listing of activities in which City agencies and citizens can be engaged to reduce risk. Each action item includes an estimate of the timeline for implementation.

The action items are organized within the following Mitigation Actions Matrix (see Executive Summary-Attachment 1), which lists all of the multi-hazard and hazard-specific action items included in the Mitigation Plan. Data collection and research and the public participation process resulted in the development of these action items (see Appendix B: Public Participation). The Matrix includes the following information for each action item:

Coordinating Organization. The coordinating organization is the public agency with regulatory responsibility to address natural hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring, and evaluation. Coordinating organizations may include local, county, or regional agencies that are capable of or responsible for implementing activities and programs.

Timeline. Action items include both short and long-term activities. Each action item includes an estimate of the timeline for implementation.

Plan Goals Addressed. The plan goals addressed by each action item are included as a way to monitor and evaluate how well the mitigation plan is achieving its goals once implementation begins. The plan goals are organized into the following five areas:

Protect Life and Property
Public Awareness
Natural Systems
Partnerships and Implementation
Emergency Services

How Will the Plan be Implemented, Monitored, and Evaluated?

The Plan Maintenance Section of this document details the formal process that will ensure that the City of Vernon Natural Hazards Mitigation Plan remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing a plan revision every five years. This section describes how the City will integrate public participation throughout the plan maintenance process. Finally, this section includes an explanation of how the City of Vernon government intends to incorporate the mitigation strategies outlined in this Plan into existing planning mechanisms such as the City's General Plan, Capital Improvement Plans, and Building & Safety Codes.

Plan Adoption

Adoption of the Natural Hazards Mitigation Plan by the local jurisdiction's governing body is one of the prime requirements for approval of the plan. Once the plan is completed, the City Council will be responsible for adopting the Mitigation Plan. The local agency governing body has the responsibility and authority to promote sound public policy regarding natural hazards. The City Council will periodically need to re-adopt the plan as it is revised to meet changes in the natural hazard risks and exposures in the community. The approved Natural Hazard Mitigation Plan will be significant in the future growth and development of the community.

Coordinating Body

The existing City of Vernon Emergency Operations Center Direction & Control Group (Direction & Control Group) will be responsible for coordinating implementation of Plan action items and undertaking the formal review process. The City Administrator (or other authority) will assign representatives from City agencies, including, but not limited to, the current Hazard Mitigation Planning Team members.

Convener

The City Council will adopt the Mitigation Plan and the Direction & Control Group will take responsibility for plan implementation. The Administrator (or his assigned designee) will serve as a convener to facilitate the Group meetings, and will assign tasks such as updating and presenting the Plan to the members of the committee. Plan implementation and evaluation will be a shared responsibility among all of the Group members.

Implementation through Existing Programs

City of Vernon addresses statewide planning goals and legislative requirements through its General Plan, Capital Improvement Plans, and City Building & Safety Codes. The Natural Hazards Mitigation Plan provides a series of recommendations that are closely related to the goals and objectives of these existing planning programs. City of Vernon

will have the opportunity to implement recommended mitigation action items through existing programs and procedures.

Economic Analysis of Mitigation Projects

The Federal Emergency Management Agency's approaches to identify costs and benefits associated with natural hazard mitigation strategies or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis. Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later. Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating natural hazards can provide decision makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Formal Review Process

The City of Vernon Natural Hazards Mitigation Plan will be evaluated on an annual basis to determine the effectiveness of programs, and to reflect changes in land development or programs that may affect mitigation priorities. The evaluation process includes a firm schedule and time line, and identifies the local agencies and organizations participating in plan evaluation. The convener will be responsible for contacting the Direction & Control Group members and organizing the annual meeting. Group members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan.

Continued Public Involvement

City of Vernon is dedicated to involving the public directly in the continual review and updates of the Natural Hazards Mitigation Plan. Copies of the plan will be catalogued and made available at City Hall.

City of Vernon Mitigation Action Matrix

Natural Hazard	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed				
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
Multi-Hazard Action Items								
MH #1-1	Integrate the goals and action items from the Natural Hazards Mitigation Plan into existing regulatory documents and programs, where appropriate.	Community Services	5 years				X	
MH #1-2	Identify and pursue funding opportunities to develop and implement local mitigation activities.	Individual Department	Ongoing				X	
MH #1-3	Establish a formal role for the EOC Direction & Control Group to develop a sustainable process for implementing, monitoring, and evaluating citywide mitigation activities.	EOC Direction & Control Group	Ongoing				X	
MH #1-4	Develop inventories of at-risk buildings and infrastructure and prioritize mitigation projects.	Community Services	5 years	X			X	
MH #1-5	Develop, enhance, and implement education programs aimed at mitigating natural hazards, and	EOC Direction & Control Group	Ongoing	X	X		X	

City of Vernon Mitigation Action Matrix

Natural Hazard	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed				
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
	reducing the risk to citizens, public agencies, private property owners, businesses, and schools.							
MH #1-6	Update SEMS Multi-Hazard Functional Plan	EOC Direction & Control Group	5 years				X	X
MH #1-7	Continue SEMS training and exercises	EOC Direction & Control Group	Ongoing	X			X	X
MH #1-8	Educate the public about emergency sheltering and evacuation procedures.	Health & Police Dept.			X			
MH #1-9	After MHFP is updated, and insure that they formally adopt the updated EOP.	EOC Direction & Control Group	Ongoing					X
MH #1-10	Establish an offsite Emergency Communications Center (ECC) and Emergency Operations Center (EOC) at Fire Station #1. In the event the primary sites must be vacated, the offsite backup centers can be rapidly mobilized in a secured facility. Both centers will	EOC Direction & Control Group	Ongoing					X

City of Vernon Mitigation Action Matrix

Natural Hazard	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed				
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
	duplicate the primary points of operation.							
MH #1-11	Ensure that when completed, there is a capability to communicate with all EOC agencies with redundant backups in voice and data communications.	EOC Direction & Control Group	Ongoing					X
MH #1-12	Train in-house shelter staff to work as a shelter team with courses including the American Red Cross's Introduction to Disasters, Shelter Operations, Mass Care and Donations Management.	Health Department	1-2 years					X
MH #1-13	Identify and prioritize needs for additional shelter supplies to include but not be limited to additional cots, blankets and shelter kits.	EOC Direction & Control Group	Ongoing	X				X
MH #1-14	Train EMS, fire fighters, law enforcement, public works, healthcare providers and other support personnel in Unified Command using the Incident	EOC Direction & Control Group	Ongoing	X				X

City of Vernon Mitigation Action Matrix

Natural Hazard	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed				
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
	Management System (IMS) model. By understanding the role of each discipline will result in a cohesive performance of their assigned tasks yielding an overall emergency response that is not only effective, but also rapid with optimal outcome.							
MH #1-15	Conduct annual tabletop disaster exercises with local law enforcement, emergency managers, county officials, and other disaster response agencies.	EOC Direction & Control Group	Ongoing					X
MH #1-16	Incorporate the training goals and objectives used by fire/EMS, law enforcement, public works, healthcare providers and other support personnel into selected hazardous material team training. This will foster the unified command relationship that will serve as the incident management blueprint for all disaster response.	Fire Department	Ongoing					X

City of Vernon Mitigation Action Matrix

Natural Hazard	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed				
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
MH #1-17	Develop a list of available training opportunities and distribute the list to all local emergency responders.	EOC Direction & Control Group	Ongoing					X
MH #1-18	Develop strategies for debris management for all events.	Community Services	2 years					X
MH #1-19	Coordinate the maintenance of emergency transportation routes through communication among the county roads department, neighboring jurisdictions, and the State Department of Transportation.	Community Services	Ongoing	X				X
MH #1-20	Determine what kinds of minor repairs and temporary protection activities (e.g., temporary roofing, protect against loss of life/injury, shoring, protect contents) can be done in the immediate aftermath of a disaster.	Community Services	5 years	X				X
MH #1-21	Conduct a full review of the Natural Hazards Mitigation Plan every 5 years by evaluating mitigation successes, failures, and areas that	EOC Direction & Control Group	5 years				X	

City of Vernon Mitigation Action Matrix

Natural Hazard	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed				
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
	were not addressed.							
MH #1-22	Enhance response capability of municipal fire, police, and emergency medical services personnel to special populations.	Police & Fire Dept.	Ongoing	X				
MH #1-23	Routine maintenance of the community's infrastructure will be done to minimize the potential for system failure due to a disaster.	Community Services & Light and Power	Ongoing	X				
MH #1-24	Partner with other organizations and agencies with similar goals to promote building codes that are more disaster resistant at the local level.	Community Services	Ongoing	X				
MH #1-25	Adoption of California Building Code by the City and amend to enhance seismic requirements as deemed necessary.	City Council / Community Services	Ongoing	X				
MH #1-26	Ensure compliance of regulations that require that any building that	Community Services	Ongoing	X				

City of Vernon Mitigation Action Matrix

Natural Hazard	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed				
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
	has been substantially damaged, for any reason, must be brought into compliance with appropriate regulations.							
MH #1-27	Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe weather events.	Community Services	Ongoing	X				
MH #1-28	Review current building codes and standards to determine adequacy for disaster restoration of properties.	Community Services	Ongoing	X				
MH #1-29	Continue to enforce the California Building Code.	Community Services	Ongoing	X				
MH #1-30	Monitor trees and branches in public areas at risk of breaking or falling in wind and sand storms. Prune or thin trees or branches when they would pose an immediate threat to	Community Services	Ongoing	X				

City of Vernon Mitigation Action Matrix

Natural Hazard	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed				
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
	property, utility lines or other significant structures or critical facilities in the Community.							
MH #1-31	Enroll Planning and Zoning, Emergency Services personnel in the Emergency Management Institute's "Digital Hazard Data" course to provide them the skills and knowledge to use digital flood data and other hazard data.	EOC Direction & Control Group	5 years					X
MH #1-32	Provide adequate and consistent enforcement of ordinances and codes within and between jurisdictions.	Community Services	Ongoing	X	X			
MH #1-33	Coordinate and integrate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures.	EOC Direction & Control Group	Ongoing					X
MH #1-34	Evaluate mitigation policies and programs and provide a mechanism to update and revise the mitigation	EOC Direction & Control Group	2 years					X

City of Vernon Mitigation Action Matrix

Natural Hazard	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed				
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
	plan.							
MH #1-35	Continue to maintain ongoing Reverse 9-1-1 System.	Police Department	Ongoing	X				
MH #1-36	Identify bridges at risk from flood or earthquake hazards, identify enhancements, and implement projects needed to reduce the risks.	Community Services	Ongoing	X				
MH #1-37	Develop strategies to mitigate risk to critical facilities, or to utilize alternative facilities should natural hazards events cause damages to the facilities in question.	Fire, Police, Community Services, Health, Final Light & Power	5 years					X
MH #1-38	Improve communication between Police and Community Services road departments to work together to prioritize and identify strategies to deal with road problems.	Police and Community Services	Ongoing	X				
MH #1-39	Establish protocol for communication between Vernon Light & Power and Community Services to assure rapid restoration of transportation	Light & Power and Community Services	Ongoing	X				X

City of Vernon Mitigation Action Matrix

Natural Hazard	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed				
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
	capabilities.							
MH #1-40	Develop a Preliminary Damage Assessment (PDA) process and review PDA data to identify planning concerns.	Community Services, Police Dept., and Fire Dept.	Ongoing	X				
MH #1-41	Compile a directory of out-of-area contractors to help with repairs/reconstruction so that restoration occurs in a timely manner.	Community Services	5 years	X				X
MH #1-42	Monitor studies to determine sufficient information to identify disaster-prone areas such as floodplains, earthquake fault lines, storm surge zones, etc.	Community Services	Ongoing	X				
MH #1-43	Encourage retrofit of highway bridges.	Community Services	Ongoing	X				
MH #1-44	Encourage railroad companies to retrofit railway bridges/facilities	Community Services	Ongoing	X				
MH #1-45	Install and improve backup power in critical facilities.	Community Services	Ongoing					X

City of Vernon Mitigation Action Matrix

Natural Hazard	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed				
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
MH #1-46	Improve water systems to assist with fire protection.	Community Services	Ongoing					X
MH #1-47	Review priorities for restoration of the community's infrastructure and vital public facilities following a disaster.	EOC Direction & Control Group	As needed					X
MH #1-48	Encourage review and amendment of structural measures for dams, dikes, and levees by U.S. Army Corps of Engineers and LA County Public Works.	Community Services	Ongoing					X
MH #1-49	Determine how, when, and under what circumstances the City will demolish structures.	Community Services	Ongoing	X				
MH #1-50	Continue enhancement of GIS setup and provide training on said setup to all pertinent community personnel.	Community Services	Ongoing					X
MH #1-51	Utility and communications systems supporting emergency services operations to determine if retrofit or relocation to withstand the impacts	Light & Power, Police, Community Services	Ongoing					X

City of Vernon Mitigation Action Matrix

Natural Hazard	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed				
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
	of disasters. Is necessary.							
MH #1-52	Encourage the development of mutual aid systems at the local level, including the Emergency Management Assistance Compact.	Police, Fire and Community Services	Ongoing					X
MH #1-53	Conduct interim planning to locate, set up, and manage temporary sites where government functions can continue their operations during recovery.	EOC Direction & Control Group	Ongoing					X
MH #1-54	Conduct a study of damaged vital public facilities and utilities and determine if they should be redesigned or relocated to avoid future disruptions.	Community Services	Ongoing					X
MH #1-55	Allocate City resources and assistance to mitigation projects when possible.	EOC Direction & Control Group	Ongoing	X				
MH #1-56	Develop a database that identifies each property that has received damage due to hazards identified	Community Services	3-5 years					X

City of Vernon Mitigation Action Matrix

Natural Hazard	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed				
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
	within this mitigation plan. The database should also include a tax identification number of the property, a description of the property damage, the value of damage, and links to photographs of the damage.							
MH #1-57	Record and maintain all tax parcel information and floodplain locations in a GIS system in order to build the community's capability to generate maps when needed.	Community Services	Ongoing		X			
MH #1-58	Write and administer appropriate grants to enhance all agencies/departments' incident response capabilities.	Individual Departments	Ongoing					X
MH #1-59	Engage the private sector to contribute to disaster preparedness and loss reduction at the local level.	EOC Direction & Control Group	Ongoing	X				
Earthquake Action Items								
EQ	Develop Earthquake Transportation	Community Services	5 years	X			X	

City of Vernon Mitigation Action Matrix

Natural Hazard	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed				
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
#2-1	Evacuation Routes and incorporate into appropriate planning documents.							
EQ #2-2	Identify funding sources for structural and nonstructural retrofitting of structures that are identified as seismically vulnerable.	Community Services	Ongoing		X		X	
EQ #2-3	Encourage seismic strength evaluations of critical facilities in the City to identify vulnerabilities for mitigation of public infrastructure, and critical facilities to meet current seismic standards.	Community Services	Ongoing	X				X
EQ #2-4	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices.	Fire Department	Ongoing	X	X			
EQ #2-5	Minimize earthquake damage risk by retrofitting critical facilities.	Community Services	Ongoing	X				
Flood Action Items								
FLD	Maintain Reverse 911 System as a	Police Department	1-2	X			X	

City of Vernon Mitigation Action Matrix

Natural Hazard	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed				
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
#3-1	flood warning systems.		years					
FLD #3-2	Work with U.S. Army Corps of Engineers to enhance data and mapping information within the City; identify and map flood-prone areas.	Community Services	Ongoing	X				
FLD #3-3	Identify surface water drainage deficiencies for all parts of the City.	Community Services	Ongoing	X				
FLD #3-4	Establish a framework to compile and coordinate storm water management plans and data throughout the City.	Community Services	3-5 years	X			X	
FLD #3-5	Understand the National Flood Insurance Program (NFIP) requirements for new construction and substantially improved buildings.	Community Services	Ongoing	X				
FLD #3-6	Maintain the flood-carrying capacity of rivers and protect the health, welfare, and safety of the public in such a way that is viewed as being mutually compatible and consistent with sustainable development.	Community Services	Ongoing	X				

City of Vernon Mitigation Action Matrix

Natural Hazard	Action Item	Coordinating Organization	Timeline	Plan Goals Addressed				
				Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
Windstorm Action Items								
WS #4-1	Develop and implement programs to keep trees from threatening lives, property, and public infrastructure during windstorm events.	Community Services	Ongoing				X	X
WS #4-2	Continue strategies for debris management for windstorm events.	Community Services	Ongoing				X	X
WS #4-3	Encourage development and enforcement of wind-resistant building siting and construction codes.	Community Services	Ongoing	X	X			

Section 1

Introduction

Throughout history, the residents of City of Vernon have dealt with the various natural hazards affecting the area. Photos, journal entries, and newspapers from the 1900's show that the residents of the area dealt with earthquakes, flooding, and windstorms.

Although there were fewer people in the area, the natural hazards adversely affected the lives of those who depended on the land and climate conditions for food and welfare. As the population of the City continues to increase, the exposure to natural hazards creates an even higher risk than previously experienced.

The City of Vernon is located in the central portion of Los Angeles County, just east of downtown Los Angeles. The City offers the benefits of living in a Mediterranean type of climate. The City is characterized by its “exclusively industrial” land use that makes the area so attractive to manufacturing industries from around the world. However, the potential impacts of natural hazards associated with the terrain make the environment and population vulnerable to natural disasters.

The City is subject to earthquakes, flooding, and windstorms. It is impossible to predict exactly when these disasters will occur, or the extent to which they will affect the area. However, with careful planning and collaboration among public agencies, private sector organizations, and citizens within the community, it is possible to minimize the losses that can result from these natural disasters.

City of Vernon most recently experienced destruction during the 1987 Whittier Narrows Earthquake.

Why Develop a Mitigation Plan?

As the cost of damage from natural disasters continues to increase, the community realizes the importance of identifying effective ways to reduce vulnerability to disasters. Natural hazard mitigation plans assist communities in reducing risk from natural hazards by identifying resources, information, and strategies for risk reduction, while helping to guide and coordinate mitigation activities throughout the City.

The plan provides a set of action items to reduce risk from natural hazards through education and outreach programs and to foster the development of partnerships, and implementation of preventative activities such as land use programs that restrict and control development in areas subject to damage from natural hazards.

The resources and information within the Mitigation Plan:

- (1) Establish a basis for coordination and collaboration among agencies and the public in City of Vernon;

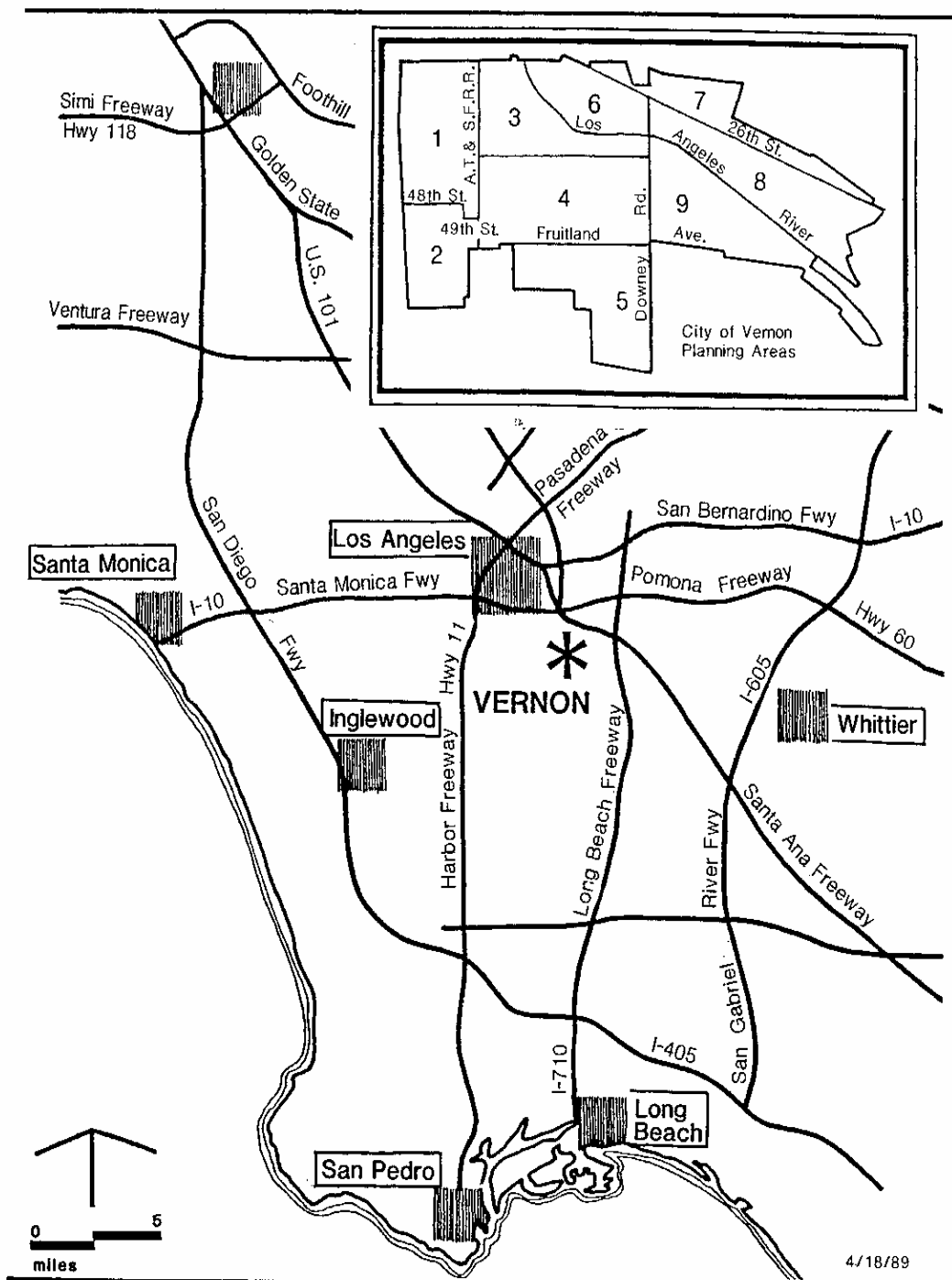
- (2) Identify and prioritize future mitigation projects; and
- (3) Assist in meeting the requirements of federal assistance programs.

The mitigation plan works in conjunction with other City plans, including the Multi-Hazard Functional Plan.

Whom Does the Mitigation Plan Affect?

The City of Vernon Natural Hazards Mitigation Plan affects the entire City. Map 1-1 shows major roads in the City of Vernon. This plan provides a framework for planning for natural hazards. The resources and background information in the plan is applicable City-wide, and the goals and recommendations can lay groundwork for other local mitigation plans and partnerships.

Map 1-1: Base Map of City of Vernon (Source: City of Vernon General Plan)



Natural Hazard Land Use Policy in California

Planning for natural hazards should be an integral element of any city's land use planning program. All California cities and counties have General Plans and the implementing ordinances that are required to comply with the statewide planning regulations.

The continuing challenge faced by local officials and state government is to keep the network of local plans effective in responding to the changing conditions and needs of California's diverse communities, particularly in light of the very active seismic region in which we live.

This is particularly true in the case of planning for natural hazards where communities must balance development pressures with detailed information on the nature and extent of hazards.

Planning for natural hazards, calls for local plans to include inventories, policies, and ordinances to guide development in hazard areas. These inventories should include the compendium of hazards facing the community, the built environment at risk, the personal property that may be damaged by hazard events and most of all, the people who live in the shadow of these hazards.

Support for Natural Hazard Mitigation

All mitigation is local, and the primary responsibility for development and implementation of risk reduction strategies and policies lies with local jurisdictions. Local jurisdictions, however, are not alone. Partners and resources exist at the regional, state and federal levels. Numerous California state agencies have a role in natural hazards and natural hazard mitigation. Some of the key agencies include:

- The Governor's Office of Emergency Services (OES) is responsible for disaster mitigation, preparedness, response, recovery, and the administration of federal funds after a major disaster declaration;
- The Southern California Earthquake Center (SCEC) gathers information about earthquakes, integrates this information on earthquake phenomena, and communicates this to end-users and the general public to increase earthquake awareness, reduces economic losses, and save lives.
- The California Division of Forestry (CDF) is responsible for all aspects of wildland fire protection on private, state, and administers forest practices regulations, including landslide mitigation, on non-federal lands.
- The California Division of Mines and Geology (DMG) is responsible for geologic hazard characterization, public education, the development of partnerships aimed at reducing risk, and exceptions (based on science-based refinement of tsunami inundation zone delineation) to state mandated tsunami zone restrictions; and

- The California Division of Water Resources (DWR) plans, designs, constructs, operates, and maintains the State Water Project; regulates dams; provides flood protection and assists in emergency management. It also educates the public, serves local water needs by providing technical assistance

Plan Methodology

Information in the Mitigation Plan is based on research from a variety of sources. Staff from the City of Vernon conducted data research and analysis, facilitated Planning Team meetings and public outreach activities, and developed the final mitigation plan. The research methods and various contributions to the plan include:

Input from the Planning Team:

The Planning Team convened several times to guide development of the Mitigation Plan. The Team played an integral role in developing the mission, goals, and action items for the Mitigation Plan. The Team consisted of representatives of seven City departments, including:

- City of Vernon Community Services & Water Department
- City of Vernon Light and Power
- City of Vernon Health Department
- City of Vernon Fire Department
- City of Vernon Police Department
- City of Vernon Finance Department
- City of Vernon Emergency Operations Center

Stakeholder Interviews:

City staff distributed copies of the Plan draft to various agencies and/or specialists from organizations interested in natural hazards planning. The data and support gained from the review process was very valuable to the overall planning effort. A complete listing of all stakeholders is located in Appendix B: Public Participation. Stakeholders interviewed for the plan included representatives from:

State and federal guidelines and requirements for mitigation plans:

Following are the Federal requirements for approval of a Natural Hazards Mitigation Plan:

- Open public involvement, with public meetings that introduce the process and project requirements.
- The public must be afforded opportunities for involvement in: identifying and assessing risk, drafting a plan, and public involvement in approval stages of the plan.
- Community cooperation, with opportunity for other local government agencies, the business community, educational institutions, and non-profits to participate in the process.

- Incorporation of local documents, including the local General Plan, the Zoning Ordinance, the Building Codes, and other pertinent documents.

The following components must be part of the planning process:

- Complete documentation of the planning process
- A detailed risk assessment on hazard exposures in the community
- A comprehensive mitigation strategy, which describes the goals & objectives, including proposed strategies, programs & actions to avoid long-term vulnerabilities
- A plan maintenance process, which describes the method and schedule of monitoring, evaluating and updating the plan and integration of the Natural Hazards Mitigation Plan into other planning mechanisms
- Formal adoption by the City Council
- Plan Review by both State OES and FEMA

These requirements are spelled out in greater detail in the following plan sections and supporting documentation.

Public participation opportunities were created through use of local media, the City's website, distribution of a Draft of the Natural Hazards Plan, and the City Council public meeting.

Through its consultant, Emergency Planning Consultants, the City had access to numerous existing mitigation plans from around the country, as well as current FEMA hazard mitigation planning standards (386 series).

Other reference materials consisted of county and city mitigation plans, including:

Clackamas County (Oregon) Natural Hazards Mitigation Plan
 Six County (Utah) Association of Governments
 Upper Arkansas Area Risk Assessment and Hazard Mitigation Plan
 Urbandale-Polk County, Iowa Plan
 Hamilton County, Ohio Plan
 Natural Hazard Planning Guidebook from Butler County, Ohio

Hazard specific research: City of Vernon staff collected data and compiled research on three hazards: earthquakes, flooding, and windstorms. Research materials came from the City General Plan, the City's Threat Assessment contained in the Multi-Hazard Functional Plan, and state agencies including OES and CDF.

The City of Vernon staff identified current mitigation activities, resources and programs, and potential action items from research materials and stakeholder interviews.

Public Input

The City of Vernon encouraged public participation and input in the Natural Hazards Mitigation Plan by publishing notices and posting on the internet. During the review

period for the Draft Plan, copies of the Plan were distributed to interested agencies and individuals. Agencies were encouraged to review public copies of the Plan Draft and participate in the City Council public meeting, which was held on October 20, 2004.

The resources and information cited in the mitigation plan provide a strong local perspective and help identify strategies and activities to make City of Vernon more disaster resistant.

How Is the Plan Used?

Each section of the mitigation plan provides information and resources to assist people in understanding the City and the hazard-related issues facing citizens, businesses, and the environment. Combined, the sections of the plan work together to create a document that guides the mission to reduce risk and prevent loss from future natural hazard events.

The structure of the plan enables people to use a section of interest to them. It also allows City government to review and update sections when new data becomes available. The ability to update individual sections of the mitigation plan places less of a financial burden on the City. Decision-makers can allocate funding and staff resources to selected pieces in need of review, thereby avoiding a full update, which can be costly and time-consuming. New data can be easily incorporated, resulting in a natural hazards mitigation plan that remains current and relevant to City of Vernon.

The Mitigation Plan is organized into three parts. Part I contains an executive summary, Mitigation Actions Matrix, introduction, and plan maintenance section. Part II contains a community profile, risk assessment, and hazard-specific sections. Part III includes the appendices. Each section of the plan is described below.

Part I: Mitigation Actions

Executive Summary: Hazard Mitigation Action Plan

The Action Plan provides an overview of the mitigation plan mission, goals, and action items.

Attachment 1: Mitigation Actions Matrix

The plan action items are included in this section, and address multi-hazard issues, as well as hazard-specific activities that can be implemented to reduce risk and prevent loss from future natural hazard events.

Section 1: Introduction

The Introduction describes the background and purpose of developing the mitigation plan for City of Vernon.

Section 2: Plan Maintenance

This section provides information on plan implementation, monitoring and evaluation.

Part II: Hazard Analysis

Section 3: Community Profile

This section presents the history, geography, demographics, and socioeconomics of the City of Vernon. It serves as a tool to provide an historical perspective of natural hazards in the City.

Section 4: Risk Assessment

This section provides information on hazard identification, vulnerability and risk associated with natural hazards in City of Vernon.

Sections 5-7: Hazard Specific Sections

Hazard-Specific Sections on the three chronic hazards is addressed in this plan. Chronic hazards occur with some regularity and may be predicted through historic evidence and scientific methods. The chronic hazards addressed in the plan include:

Section 5: Earthquake
Section 6: Flooding
Section 7: Windstorm

Each of the hazard-specific sections includes information on the history, hazard causes and characteristics, and hazard assessment.

Part III: Resources

The plan appendices are designed to provide users of the City of Vernon Natural Hazards Mitigation Plan with additional information to assist them in understanding the contents of the mitigation plan, and potential resources to assist them with implementation.

Appendix A: Plan Resource Directory

The resource directory includes City, regional, state, and national resources and programs that may be of technical and/or financial assistance to City of Vernon during plan implementation.

Appendix B: Public Participation

This appendix includes specific information on the various public processes used during development of the plan.

Appendix C: Benefit/Cost Analysis

This section describes FEMA's requirements for benefit cost analysis in natural hazards mitigation, as well as various approaches for conducting economic analysis of proposed mitigation activities.

Appendix D: List of Acronyms

This section provides a list of acronyms for City, regional, state, and federal agencies and organizations that may be referred to within the City of Vernon Natural Hazards Mitigation Plan.

Appendix E: Glossary

This section provides a glossary of terms used throughout the plan.

Section 2:

Plan Maintenance

The Plan Maintenance Section of this document details the formal process that will ensure that the Natural Hazards Mitigation Plan remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing a plan revision every five years. This section describes how the City will integrate public participation throughout the plan maintenance process. Finally, this Section includes an explanation of how the City of Vernon government intends to incorporate the mitigation strategies outlined in this Plan into existing planning mechanisms such as the City's General Plan, Capital Improvement Plans, and Building and Safety Codes.

Monitoring and Implementing the Plan

Plan Adoption

The City Council will be responsible for adopting the Natural Hazards Mitigation Plan. This governing body has the authority to promote sound public policy regarding natural hazards. Once the plan has been adopted, the City's Director of Community Services and Water will be responsible for submitting it to the State Hazard Mitigation Officer at The Governor's Office of Emergency Services. The Governor's Office of Emergency Services will then submit the plan to the Federal Emergency Management Agency (FEMA) for review. This review will address the federal criteria outlined in FEMA Interim Final Rule 44 CFR Part 201. Upon acceptance by FEMA, the City will gain eligibility for Hazard Mitigation Grant Program funds.

Coordinating Body

The City's existing Emergency Operations Center Direction & Control Group (EOC Direction & Control Group) will be responsible for coordinating implementation of plan action items and undertaking the formal review process. The City Administrator (or other authority) will assign representatives from City agencies, including, but not limited to, the current Hazard Mitigation Planning Team members. The EOC Direction & Control Group consists of the following representatives:

- Mayor
- City Administrator
- City Attorney
- Police Chief
- Fire Chief
- Battalion Chief
- Police Captain
- Director of Community Services
- Operations Manager of Light and Power

- Risk Manager
- Finance Manager
- Secretary of the E.O.C.

The EOC Direction & Control Group will meet no less than quarterly. These meetings will provide an opportunity to discuss the progress of the action items and maintain the partnerships that are essential for the sustainability of the mitigation plan.

Convener

The City Council will adopt the Natural Hazards Mitigation Plan, and the EOC Direction & Control Group will take responsibility for plan implementation. The City Administrator (or his designee) will serve as a convener to facilitate the Group meetings, and will assign tasks such as updating and presenting the Plan to the members of the Group. Plan implementation and evaluation will be a shared responsibility among all of the Group members.

Implementation through Existing Programs

The City addresses statewide planning goals and legislative requirements through its General Plan, Capital Improvement Plans, and City Building and Safety Codes. The Natural Hazards Mitigation Plan provides a series of recommendations - many of which are closely related to the goals and objectives of existing planning programs. The City will have the opportunity to implement recommended mitigation action items through existing programs and procedures.

The City's Building & Safety Department is responsible for administering the Building & Safety Codes. In addition, the Group will work with other agencies at the state level to review, develop and ensure Building & Safety Codes that are adequate to mitigate or prevent damage by natural hazards. This is to ensure that life-safety criteria are met for new construction.

The goals and action items in the mitigation plan may be achieved through activities recommended in the City's Capital Improvement Plans (CIP). Various City departments develop CIP plans, and review them on an annual basis. Upon annual review of the CIPs, the Group will work with the City departments to identify action items in the Natural Hazards Mitigation Plan consistent with CIP planning goals and integrate them where appropriate.

Within one year of formal adoption of the Mitigation Plan, the recommendations listed above will be incorporated into the process of existing planning mechanisms at the City level. The meetings of the EOC Direction & Control Group will provide an opportunity for members to report back on the progress made on the integration of mitigation planning elements into the City's planning documents and procedures.

Economic Analysis of Mitigation Projects

FEMA's approaches to identify the costs and benefits associated with natural hazard mitigation strategies, measures, or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis.

Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later.

Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating natural hazards can provide decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Given federal funding, the EOC Direction & Control Group will use a FEMA-approved benefit/cost analysis approach to identify and prioritize mitigation action items. For other projects and funding sources, the Committee will use other approaches to understand the costs and benefits of each action item and develop a prioritized list. For more information regarding economic analysis of mitigation action items, please see Appendix C: Benefit/Cost Analysis.

Evaluating and Updating the Plan

Formal Review Process

The Natural Hazards Mitigation Plan will be evaluated on an annual basis to determine the effectiveness of programs, and to reflect changes in land development or programs that may affect mitigation priorities. The evaluation process includes a firm schedule and timeline, and identifies the local agencies and organizations participating in plan evaluation. The convener or designee will be responsible for contacting the EOC Direction & Control Group members and organizing the annual meeting.

Group members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan.

The Group will review the goals and action items to determine their relevance to changing situations in the City, as well as changes in State or Federal policy, and to ensure they are addressing current and expected conditions. The Group will also review the Risk Assessment portion of the Plan to determine if this information should be updated or modified, given any new available data. The coordinating organizations responsible for the various action items will report on the status of their projects, the success of various implementation processes, difficulties encountered, success of coordination efforts, and which strategies should be revised.

The convener will assign the duty of updating the plan to one or more of the Group members. The designated Group members will have three months to make appropriate

changes to the Plan before submitting it to the members, and presenting it to the City Council (or other authority). The Group will also notify all holders of the City's Plan when changes have been made. Every five years the updated Plan will be submitted to the State Hazard Mitigation Officer and the Federal Emergency Management Agency for review.

Continued Public Involvement

The City is dedicated to involving the public directly in review and updates of the Natural Hazards Mitigation Plan. The EOC Direction & Control Group members are responsible for the annual review and update of the plan.

The public will also have the opportunity to provide feedback about the Plan. Copies of the Plan will be catalogued and kept at all of the appropriate agencies in the City. The plan also includes the address and the phone number of the City Planning Division, responsible for keeping track of public comments on the Plan.

In addition, copies of the Plan and any proposed changes will be posted on the City's website. This site will also contain an email address and phone number to which people can direct their comments and concerns.

A public meeting will also be held after each annual evaluation or as deemed necessary by the EOC Direction & Control Group. The meetings will provide the public a forum for which they can express its concerns, opinions, or ideas about the Plan.

Section 3:

Community Profile

Why Plan for Natural Hazards in City of Vernon?

Natural hazards impact citizens, property, the environment, and the economy of City of Vernon. Earthquakes, flooding, and windstorms have exposed City of Vernon residents and businesses to the financial and emotional costs of recovering after natural disasters. The risk associated with natural hazards increases as more people move to areas affected by natural hazards.

Even in those communities that are essentially “built-out” i.e., have little or no vacant land remaining for development; population density continues to increase when low density housing is replaced with medium and high density development projects.

The inevitability of natural hazards, and the growing population and activity within the City create an urgent need to develop strategies, coordinate resources, and increase public awareness to reduce risk and prevent loss from future natural hazard events. Identifying the risks posed by natural hazards, and developing strategies to reduce the impact of a hazard event can assist in protecting life and property of citizens and communities. Local residents and businesses can work together with the City to create a natural hazards mitigation plan that addresses the potential impacts of hazard events.

Geography and the Environment

Vernon is unusual among cities in California and in the nation because of its specialized, industrial character. As an exclusively industrial city, Vernon is able to focus on the needs and desires of the industrial community.

City of Vernon has an area of 5.1 square miles and is located in central core of Los Angeles County. The City is bounded on the north and west by Los Angeles, on the east by the Commerce and Bell, and on the south by Huntington Park and Maywood. Vernon is three miles southeast of downtown Los Angeles and 15 miles north of the major harbor and port facilities in San Pedro (see Section 1: Introduction, Map 1-1).

Elevations in the City are approximately 100 feet above sea level. The terrain of the City is flat.

The City is within two miles of four major freeways and is the site of Hobart Yard, which is a major rail terminal for Los Angeles. According to Vernon’s General Plan, the City’s location in the second largest market in the nation and its proximity to the center of the region’s transportation network have been major factors in attracting new industry in the past and continue to be assets today.

The City is surrounded by Interstate 710 to the east, Interstate 5 to the north, Interstate 110 to the west and Interstate 105 to the south.

The City is served by four railroads, operating 114 miles of railroad lines within the City's boundaries. Two of the lines are transcontinental systems: Burlington Northern Santa Fe and Union Pacific. The third, the Los Angeles Junction Railroad, provides an intra-city belt system. As a result, virtually every industry and business is on a direct transcontinental rail line. The fourth line is maintained by Amtrak, a national rail service that passes through the northern portion of the City.

Community Profile

The City of Vernon is as rich in history. The area comprising the City of Vernon was planned as an industrial city when it was incorporated in 1905.

The following excerpt information was taken from "City of Vernon," prepared by Pete Moruzzi for the Los Angeles Conservancy tour publication Cruising Industrial Los Angeles, October 1997.

Vernon was founded and incorporated in 1905 by James J. and Thomas J. Furlong, both ranchers, and John B. Leonis, rancher and merchant. John Leonis was of Basque origin, coming to Southern California in 1880 to work for his Uncle Miguel Leonis whose original 1862 adobe dwelling in Calabasas was designated City of Los Angeles Cultural-Historic Monument #1. John Leonis established his own ranch on unincorporated county land southeast of Downtown. Recognizing the significance of the three major railroads running through the area, he convinced railroad executives to run spur tracks off the main lines and incorporated the adjacent three miles as an "exclusively industrial" city named after a dirt road, Vernon Avenue, crossing its center.

While waiting for industry to develop in the area, the founders of the city thought of marketing Vernon as a "Sporting Town." In 1907, on land leased from Leonis, Entrepreneur Jack Doyle opened what was billed as the "longest bar in the world." It had 37 bartenders, 37 cash registers and a sign advising "if your children need shoes, don't buy booze." Next door Doyle opened the Vernon Avenue Arena where 20-round world championship fights were held starting in 1908. Soon after, the Pacific Coast (baseball) League built a ballpark with its left field corner abutting Doyle's bar and its own entrance into the park. The Vernon Tigers won three Consecutive league pennants. Last call for Doyle's Bar was June 30, 1919 when over 1,000 people swilled their last pre-Prohibition drink. The Chamber of Commerce now sits atop Doyle's onetime empire.

After 1919, Vernon went back to being exclusively industrial. Two giant stockyards, one owned by John Leonis, opened with meat packing quickly becoming Vernon's signature industry. Twenty-seven slaughterhouses lined Vernon Avenue from Soto Street to Downey Road until the late 1960s. Said one

longtime Boyle Heights Resident, "we could smell Vernon in the evenings at our home."

In the 1920s and 30s, heavy industries such as steel (U.S. and Bethlehem), aluminum (Alcoa), glass (Owens), can-making (American Can) and automobile production (Studebaker) grew in the City. The 1940s and 50s added aerospace contractors (Norris Industries), box and paper manufacturers, drug companies (Brunswick), and food processors (General Mills, Kal Kan). Giant meat packers (Farmer John and Swift) continued to grow. A strong, unionized labor force meant excellent middle class incomes for thousands of families.

In 1932, the City differed with Southern California Edison over industrial rates for electricity, John Leonis orchestrated a Vernon bond measure to authorize the construction of the city's own Light & Power plant, which is still operational today. Low-cost power and water, along with low taxes, attracted businesses to Vernon. Later, economical factors including, the free flow of capital and labor across borders had, by 1980, utterly transformed Vernon's industrial face.

Today smaller industrial/commercial establishments including fashion design, garment-making, film production, electronics, and waste recycling are characteristic of the business community in Vernon.

Major Rivers

The Los Angeles River runs through the northeasterly part of the City. The River does not have any particular impact on the City of Vernon. Normally this River channel is dry and only carries a significant water flow during a major rainstorm. The River channel is part of the County Flood Control District and the City is protected by a levee wall to a height of 10 to 15 feet in certain portions of the City.

Climate

Average temperatures in the City of Vernon range from an average low of 47.1 degrees in the winter months to average high of 82.4 degrees in the summer months. However the temperatures can vary over a wide range, particularly when the Santa Ana winds blow, bringing higher temperatures and very low humidity.

Rainfall in the city averages 14.8 inches of rain per year. But the term "average" means very little in this region as the annual rainfall during this time period has ranged from only 4.35 inches in 2001-2002 to 38.2 inches in 1883-1884.

Furthermore, actual rainfall in Southern California tends to fall in large amounts during sporadic and often heavy storms rather than consistently over storms at somewhat regular intervals. In short, rainfall in Southern California might be characterized as feast or famine within a single year. Because the metropolitan basin is largely built out, water originating in higher elevation communities can have a sudden impact on adjoining

communities that have a lower elevation.

Minerals and Soils

The characteristics of the minerals and soils present in City of Vernon indicate that potential types of hazards that may occur. Rock hardness and soil characteristics can determine whether or not an area will be prone to geologic hazards such as earthquakes, liquefaction and landslides.

The surface material includes unconsolidated, fine-grained deposits of silt, sand, and recent flood plain deposits. Torrential flood events can introduce large deposits of sand and gravel. Sandy silt and silt containing clay are moderately dense and firm, and are primarily considered to be prone to liquefaction, an earthquake related hazard. Understanding the geologic characteristics of City of Vernon is an important step in hazard mitigation and avoiding at-risk development.

Other Significant Geologic Features

City of Vernon, like most of the Los Angeles Basin, lie over the area of one or more known earthquake faults, and potentially many more unknown faults, particularly so-called lateral or blind thrust faults.

The major faults that have the potential to affect the greater Los Angeles Basin, and therefore the City of Vernon are the:

- San Andreas
- Newport Inglewood
- Palos Verdes and
- Whittier Narrows

The Los Angeles Basin has a history of powerful and relatively frequent earthquakes, dating back to the powerful 8.0+ 1857 San Andreas Earthquake which did substantial damage to the relatively few buildings that existed at the time. Paleoseismological research indicates that large (8.0+) earthquakes occur on the San Andreas fault at intervals between 45 and 332 years with an average interval of 140 years¹. Other lesser faults have also caused very damaging earthquakes since 1857. Notable earthquakes include the 1933 Long Beach Earthquake of 1933, the 1971 San Fernando Earthquake, the 1987 Whittier Earthquake and the 1994 Northridge Earthquake.

In addition, many areas in the Los Angeles Basin have sandy soils that are subject to liquefaction. The City of Vernon has liquefaction zones and is discussed in Section 5: Earthquake.

¹ Peacock, Simon M.,
<http://aamc.geo.lsa.umich.edu/eduQuakes/EQpredLab/EQprediction.peacock.html>

Population and Demographics

City of Vernon has a resident population of about 90 in an area of 5.10 square miles. The daytime working population is approximately 45,000. As noted in the MHFP Threat Assessment, the population of the City is less at risk during non-working hours, as the nighttime population in the City of Vernon is considerably less.

Of the 1,200 business establishments with the City, approximately 700 of them produce, store, handle, dispose of, treat, or recycle some form of hazardous materials. As a result of mandates from the State of California, the Vernon City Council has designated, through Ordinance No. 961 that the Health and Environmental Control Section, in conjunction with the Fire Department, implement a program to register and monitor all of these hazardous materials establishments.

The possibility of pipeline rupture is an additional concern in the City of Vernon. A pipeline rupture that occurs in a heavily populated industrial area can result in considerable loss of life and property. In addition, the release of toxic materials into the atmosphere, surface and/or groundwater supplies pose serious health consequences and are of special concern. See Section 5: Earthquake for additional discussion on the topic of pipeline ruptures.

In the 1987 publication, Fire Following Earthquake issued by the All Industry Research Advisory Council, Charles Scawthorn explains how a post-earthquake urban conflagration would develop. The conflagration would be started by fires resulting from earthquake damage, but made much worse by the loss of pressure in the fire mains, caused by either lack of electricity to power water pumps, and /or loss of water pressure resulting from broken fire mains.

Furthermore, increased density can affect risk. For example, narrower streets are more difficult for emergency service vehicles to navigate, the higher ratio of residents to emergency responders affects response times, and homes located closer together increase the chances of fires spreading.

Natural hazards do not discriminate, but the impacts in terms of vulnerability and the ability to recover vary greatly among the population. According to Peggy Stahl of the Federal Emergency Management Agency (FEMA) Preparedness, Training, and Exercise Directorate, 80% of the disaster burden falls on the public, and within that number, a disproportionate burden is placed upon special needs groups: women, children, minorities, and the poor.²

Vulnerable populations, including seniors, disabled citizens, women, and children, as well as those people living in poverty, may be disproportionately impacted by natural hazards.

² www.fema.gov

Examining the reach of hazard mitigation policies to special needs populations may assist in increasing access to services and programs. FEMA's Office of Equal Rights addresses this need by suggesting that agencies and organizations planning for natural disasters identify special needs populations, make recovery centers more accessible, and review practices and procedures to remedy any discrimination in relief application or assistance.

The cost of natural hazards recovery can place an unequal financial responsibility on the general population when only a small proportion may benefit from governmental funds used to rebuild private structures. Discussions about natural hazards that include local citizen groups, insurance companies, and other public and private sector organizations can help ensure that all members of the population are a part of the decision-making processes.

Land and Development

Development in Southern California from the earliest days was a cycle of boom and bust. The Second World War however dramatically changed that cycle. Military personnel and defense workers came to Southern California to fill the logistical needs created by the war effort. The available housing was rapidly exhausted and existing commercial centers proved inadequate for the influx of people. Immediately after the war, construction began on the freeway system, and the face of Southern California was forever changed. Home developments and shopping centers sprung up everywhere and within a few decades the central basin of Los Angeles County was virtually built out. This pushed new development further and further away from the urban center.

The City of Vernon is fully developed with predominately industrial uses. Therefore the daytime population density is not expected to increase. However, in light of the manufacturing and industrial uses, the service loads on the built infrastructure, including roads, water supply, sewer services and storm drains increase with each passing year.

The City of Vernon General Plan addresses the use and development of private land, including residential and commercial areas. This plan is one of the City's most important tools in addressing environmental challenges including transportation and air quality; growth management; conservation of natural resources; clean water and open spaces.

The environment of most Los Angeles County cities is nearly identical with that of their immediate neighbors and the transition from one incorporated municipality to another is seamless to most people. Seamless too are the exposures to the natural hazards that affect all of Southern California.

Housing and Community Development

	City of Vernon
Development Type	
Residential	0.2%
Commercial/Industrial	99.8%
Housing Type	
Single-Family	73.1%
Multi-Residential (5-9 units)	7.7%
Multi-Residential (20+ units)	19.2%
Mobilehomes	0%
Housing Statistics	
Total Available Housing Units	26
Owner-Occupied Housing	16%
Average Household Size	3.64
Median Home Value	\$225,000

There are fewer than 25 homes and only one apartment building in the City. There are 1,200 industrial uses located in the City.

Existing Land Uses

Land Use	Acres	Percent Total
Manufacturing	1,221.00	37.7%
Warehousing	488.00	15.1%
Trucking	383.00	11.8%
Retail	22.00	0.7%
Commercial	55.00	1.7%
City	42.00	1.3%
Residential	0.61	0.0%
Streets, Railroad ROW And Spur Lines, Utilities ROW, Los Angeles River	962.00	29.7%
Vacant	64.00	2.0%
TOTAL	3,238.00*	100 %

*Total has been rounded.

Source: General Plan

Mitigation activities are needed at the business level to ensure the safety and welfare of workers and limit damage to industrial infrastructure. Employees are highly mobile, commuting from surrounding areas to industrial and business centers. This creates a greater dependency on roads, communications, accessibility and emergency plans to reunite people with their families. Before a natural hazard event, large and small businesses can develop strategies to prepare for natural hazards, respond efficiently, and prevent loss of life and property.

Transportation and Commuting Patterns

Private automobiles are the dominant means of transportation in Southern California and in the City of Vernon. However, the City of Vernon meets its public transportation needs through a mixture of a regional transit system and various city contracted bus systems. The Metropolitan Transportation Authority (MTA) provides both bus and light rail service to the City of Vernon and to the Los Angeles County metropolitan area. The Metro Rail System is part of a multimodal transportation system developed by the Los Angeles County Transportation Authority.

Metrolink is a commuter train network that connects long-distance commuters from outlying communities to Union Station in downtown Los Angeles. The Metrolink commuter train runs through the northern portion of the City of Vernon, along the railroad yard north of 26th Street.

As stated in the City's General Plan, the City of Vernon is served by the Interstates 5, 10 and 710, connecting the city to adjoining parts of Los Angeles County. The City's 47.6 mile road system includes 10.3 miles of major arterial highways and 37.3 miles of minor arterials, collectors, and local roads, and 5 city bridges. As daily transit rises, there is an increased risk that a natural hazard event will disrupt the travel plans of residents and businesses across the region, as well as local, regional and national commercial traffic.

Localized flooding can render roads unusable. A severe winter storm has the potential to disrupt the daily driving routine of hundreds of thousands of people. Natural hazards can disrupt automobile traffic and shut down local and regional transit systems.

Section 4:

Risk Assessment

What is a Risk Assessment?

Conducting a risk assessment can provide information: on the location of hazards, the value of existing land and property in hazard locations, and an analysis of risk to life, property, and the environment that may result from natural hazard events. Specifically, the three levels of a risk assessment are as follows:

1) Hazard Identification

This is the description of the geographic extent, potential intensity and the probability of occurrence of a given hazard. Maps are frequently used to display hazard identification data. The City of Vernon identified three major hazards that affect this geographic area. These hazards – earthquakes, flooding, and windstorm - were identified through an extensive process that utilized input from the Hazard Mitigation Planning Team. The geographic extent of each of the identified hazards has been identified by the City of Vernon utilizing the maps contained in the City's General Plan and the MHFP Threat Assessment, and are illustrated in the tables, maps, and photos listed on page iii.

2) Profiling Hazard Events

The maps help to describe the causes and characteristics of each hazard and what part of the City's population, infrastructure, and environment may be vulnerable to each specific hazard. A profile of each hazard discussed in this plan is provided in each hazard section. For a full description of the history of hazard specific events, please see the appropriate hazard chapter.

3) Vulnerability Assessment/Inventorying Assets

This is a combination of hazard identification with an inventory of the existing (or planned) property development(s) and population(s) exposed to a hazard. Critical facilities are of particular concern because these facilities provide critical products and services to the general public that are necessary to preserve the welfare and quality of life in the City and fulfill important public safety, emergency response, and/or disaster recovery functions. The critical facilities have been identified and are illustrated in Table 4-2. In addition, this Table indicates vulnerabilities to the various identified hazards.

4) Risk Analysis

Estimating potential losses involves assessing the damage, injuries, and financial costs likely to be sustained in a geographic area over a given period of time. This level of analysis involves using mathematical models. The two measurable components of risk analysis are magnitude of the harm that may result and the likelihood of the harm occurring. Describing vulnerability in terms of dollar losses provides the community and the state with a common framework in which to measure the effects of hazards on assets.

5) Assessing Vulnerability/ Analyzing Development Trends

This step provides a general description of land uses and development trends within the community so that mitigation options can be considered in land use planning and future land use decisions. This plan provides comprehensive description of the character of City of Vernon in the Community Profile. This description includes the geography and environment, population and demographics, land use and development, housing and community development, employment and industry, and transportation and commuting patterns. Analyzing these components of City of Vernon can help in identifying potential problem areas and can serve as a guide for incorporating the goals and ideas contained in this mitigation plan into other community development plans.

Hazard assessments are subject to the availability of hazard-specific data. Gathering data for a hazard assessment requires a commitment of resources on the part of participating organizations and agencies. Each hazard-specific section of the plan includes a section on hazard identification using data and information from City, County or State agency sources.

Regardless of the data available for hazard assessments, there are numerous strategies the City can take to reduce risk. These strategies are described in the action items detailed in each hazard section of this Plan. Mitigation strategies can further reduce disruption to critical services, reduce the risk to human life, and alleviate damage to personal and public property and infrastructure. Action items throughout the hazard sections provide recommendations to collect further data to map hazard locations and conduct hazard assessments.

Federal Requirements for Risk Assessment

Recent federal regulations for hazard mitigation plans outlined in 44 CFR Part 201 include a requirement for risk assessment. This risk assessment requirement is intended to provide information that will help communities to identify and prioritize mitigation activities that will reduce losses from the identified hazards. There are three hazards profiled in the mitigation plan, including earthquake, flooding, and windstorm. The Federal criteria for risk assessment and information on how the City of Vernon Natural Hazards Mitigation Plan meets those criteria is outlined in Table 4-1 below.

Table 4-1: Federal Criteria for Risk Assessment

Section 322 Plan Requirement	How is this addressed?
Identifying Hazards	Each hazard section includes an inventory of the best available data sources that identify hazard areas. To the extent data are available; the existing maps identifying the location of the hazard were utilized. The Executive Summary and the Risk Assessment sections of the plan include a list of the hazard maps.
Profiling Hazard Events	Each hazard section includes documentation of the history, and causes and characteristics of the hazard in the City.
Assessing Vulnerability: Identifying Assets	Where data is available, the vulnerability assessment for each hazard addressed in the mitigation plan includes an inventory of all publicly owned land within hazardous areas. Each hazard section provides information on vulnerable areas in the City in the Community Issues section. Each hazard section also identifies potential mitigation strategies.
Assessing Vulnerability: Estimating Potential Losses:	The Risk Assessment Section of this mitigation plan identifies key critical facilities in the City and includes a map of these facilities. Vulnerability assessments have been completed for the hazards addressed in the plan.
Assessing Vulnerability: Analyzing Development Trends	The Community Profile Section of this plan provides a description of the development trends in the City, including the geography and environment, population and demographics, land use and development, housing and community development, employment and industry, and transportation and commuting patterns.

Critical and Essential Facilities

Facilities critical to government response and recovery activities (i.e., life safety and property and environmental protection) include: 911 centers, emergency operations centers, police and fire stations, public works facilities, communications centers, sewer and water facilities, hospitals, bridges and roads, shelters, and shelters. Also, facilities that, if damaged, could cause serious secondary impacts may also be considered "critical." A hazardous material facility is one example of this type of critical facility.

Critical and essential facilities are those facilities that are vital to the continued delivery of key government services or that may significantly impact the public's ability to recover from the emergency. These facilities may include: buildings such as the jail, law enforcement center, public services building, and other public facilities such as schools. The following table illustrates the critical and essential facilities serving the City of

Vernon.

Table 4-2: City of Vernon Critical and Essential Facilities Vulnerable to Hazards

EQ	Flood	Wind	Facility	Address
X	N/A	X	Civic Center/Police Station	4305 Santa Fe Avenue
X	N/A	X	Public Works Facility	4305 Santa Fe Avenue
X	N/A	X	Light and Power Control Center	2715 50 th Street
X	N/A	X	Fire Station #1	3375 Fruitland Avenue
X	N/A	X	Fire Station #2	4301 Santa Fe Avenue
X	X	X	Fire Station #3	2800 Soto Street
X	N/A	X	Fire Station #4	4530 Bandini Boulevard

Summary

Natural hazard mitigation strategies can reduce the impacts concentrated at large employment and industrial centers, public infrastructure, and critical facilities. Natural hazard mitigation for industries and employers may include developing relationships with emergency management services and their employees before disaster strikes, and establishing mitigation strategies together. Collaboration among the public and private sector to create mitigation plans and actions can reduce the impacts of natural hazards.

Section 5: Earthquake Hazards in the City of Vernon

Why Are Earthquakes a Threat to the City of Vernon?

The most recent significant earthquake event affecting Southern California was the January 17th 1994 Northridge Earthquake. At 4:31 A.M. on Monday, January 17, a moderate but very damaging earthquake with a magnitude of 6.7 struck the San Fernando Valley. In the following days and weeks, thousands of aftershocks occurred, causing additional damage to affected structures.

57 people were killed and more than 1,500 people seriously injured. For days afterward, thousands of homes and businesses were without electricity; tens of thousands had no gas; and nearly 50,000 had little or no water. Approximately 15,000 structures were moderately to severely damaged, which left thousands of people temporarily homeless. 66,500 buildings were inspected. Nearly 4,000 were severely damaged and over 11,000 were moderately damaged. Several collapsed bridges and overpasses created commuter havoc on the freeway system. Extensive damage was caused by ground shaking, but earthquake triggered liquefaction and dozens of fires also caused additional severe damage. This extremely strong ground motion in large portions of Los Angeles County resulted in record economic losses.

However, the earthquake occurred early in the morning on a holiday. This circumstance considerably reduced the potential effects. Many collapsed buildings were unoccupied, and most businesses were not yet open. The direct and indirect economic losses ran into the 10's of billions of dollars.

Historical and geological records show that California has a long history of seismic events. Southern California is probably best known for the San Andreas Fault, a 400 mile long fault running from the Mexican border to a point offshore, west of San Francisco. "Geologic studies show that over the past 1,400 to 1,500 years large earthquakes have occurred at about 130 year intervals on the southern San Andreas Fault. As the last large earthquake on the Southern San Andreas occurred in 1857, that section of the fault is considered a likely location for an earthquake within the next few decades."¹

But San Andreas is only one of dozens of known earthquake faults that crisscross Southern California. Some of the better known faults include the Newport-Inglewood, Whittier, Chatsworth, Elsinore, Hollywood, Los Alamitos, Puente Hills, and Palos Verdes faults. Beyond the known faults, there are a potentially large number of "blind" faults that underlie the surface of Southern California. One such blind fault was involved in the 1987 Whittier Narrows Earthquake.

Although the most famous of the faults, the San Andreas, is capable of producing an earthquake with a magnitude of 8+ on the Richter Scale, some of the "lesser" faults have the potential to inflict greater damage on the urban core of the Los Angeles Basin. Seismologists believe that a 6.0 earthquake on the Newport-Inglewood would result in far more death and destruction than a "great" quake on the San Andreas, because the San Andreas is relatively remote from the urban centers of Southern California.

For decades, partnerships have flourished between the USGS, Cal Tech, the California Geological Survey and universities to share research and educational efforts with Californians. Tremendous earthquake mapping and mitigation efforts have been made in California in the past two decades, and public awareness has risen remarkably during this time. Major federal, state, and local government agencies and private organizations support earthquake risk reduction, and have made significant contributions in reducing the adverse impacts of earthquakes. Despite the progress, the majority of California communities remain unprepared because there is a general lack of understanding regarding earthquake hazards among Californians.

Table 5-1: Earthquake Events in the Southern California Region

Southern California Region Earthquakes with a Magnitude 5.0 or Greater			
1769	Los Angeles Basin	1916	Tejon Pass Region
1800	San Diego Region	1918	San Jacinto
1812	Wrightwood	1923	San Bernardino Region
1812	Santa Barbara Channel	1925	Santa Barbara
1827	Los Angeles Region	1933	Long Beach
1855	Los Angeles Region	1941	Carpenteria
1857	Great Fort Tejon Earthquake	1952	Kern County
1858	San Bernardino Region	1954	W. of Wheeler Ridge
1862	San Diego Region	1971	San Fernando
1892	San Jacinto or Elsinore Fault	1973	Point Mugu
1893	Pico Canyon	1986	North Palm Springs
1894	Lytle Creek Region	1987	Whittier Narrows
1894	E. of San Diego	1992	Landers
1899	Lytle Creek Region	1992	Big Bear
1899	San Jacinto and Hemet	1994	Northridge
1907	San Bernardino Region	1999	Hector Mine
1910	Glen Ivy Hot Springs		

Source:

http://geology.about.com/gi/dynamic/offsite.htm?site=http%3A%2F%2Fpasadena.wr.usgs.gov%2Finfo%2Fcahist_eqs.html

To better understand the earthquake hazard, the scientific community has looked at historical records and accelerated research on those faults that are the sources of the earthquakes occurring in the Southern California region. Historical earthquake records can generally be divided into records of the pre-instrumental period and the instrumental period. In the absence of instrumentation, the detection of earthquakes is based on observations and felt reports, and is dependent upon population density and distribution. Since California was sparsely populated in the 1800s, the detection of pre-instrumental earthquakes is relatively difficult. However, two very large earthquakes, the Fort Tejon in 1857 (7.9) and the Owens Valley in 1872 (7.6) are evidence of the tremendously damaging potential of earthquakes in Southern California. In more recent times two 7.3 earthquakes struck Southern California, in Kern County (1952) and Landers (1992). The damage from these four large earthquakes was limited because they occurred in areas which were sparsely populated at the time they happened. The seismic risk is much more severe today than in the past because the population at risk is in the millions, rather than a few hundred or a few thousand persons.

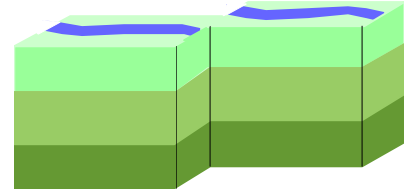
History of Earthquake Events in Southern California

Since seismologists started recording and measuring earthquakes, there have been tens of thousands of recorded earthquakes in Southern California, most with a magnitude below three. No community in Southern California is beyond the reach of a damaging earthquake. Figure 5-1 describes the historical earthquake events that have affected Southern California.

Figure 5-1: Causes and Characteristics of Earthquakes in Southern California

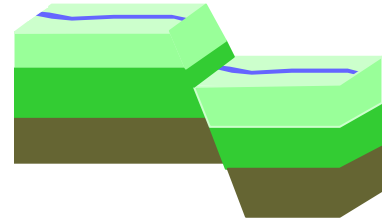
Earthquake Faults

A fault is a fracture along between blocks of the earth's crust where either side moves relative to the other along a parallel plane to the fracture.



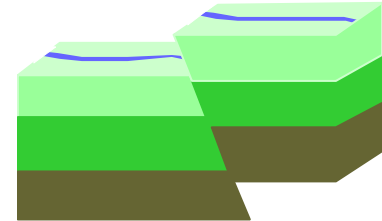
Strike-slip

Strike-slip faults are vertical or almost vertical rifts where the earth's plates move mostly horizontally. From the observer's perspective, if the opposite block looking across the fault moves to the right, the slip style is called a right lateral fault; if the block moves left, the shift is called a left lateral fault.



Dip-slip

Dip-slip faults are slanted fractures where the blocks mostly shift vertically. If the earth above an inclined fault moves down, the fault is called a normal fault, but when the rock above the fault moves up, the fault is called a reverse fault. Thrust faults have a reverse fault with a dip of 45 ° or less.



Dr. Kerry Sieh of Cal Tech has investigated the San Andreas Fault at Palmett Creek. “The record at Palmett Creek shows that rupture has recurred about every 130 years, on average, over the past 1500 years. But actual intervals have varied greatly, from less than 50 years to more than 300. The physical cause of such irregular recurrence remains unknown.”² Damage from a great quake on the San Andreas would be widespread throughout Southern California.

Earthquake Related Hazards

Ground shaking, landslides, liquefaction, and amplification are the specific hazards associated with earthquakes. The severity of these hazards depends on several factors, including soil and slope conditions, proximity to the fault, earthquake magnitude, and the type of earthquake.

Ground Shaking

Ground shaking is the motion felt on the earth's surface caused by seismic waves generated by the earthquake. It is the primary cause of earthquake damage. The strength of ground shaking depends on the magnitude of the earthquake, the type of fault, and distance from the epicenter (where the earthquake originates). Buildings on poorly consolidated and thick soils will typically see more damage than buildings on consolidated soils and bedrock.

Earthquake-Induced Landslides

Earthquake-induced landslides are secondary earthquake hazards that occur from ground shaking. They can destroy the roads, buildings, utilities, and other critical facilities necessary to respond and recover from an earthquake. Many communities in Southern California have a high likelihood of encountering such risks, especially in areas with steep slopes.

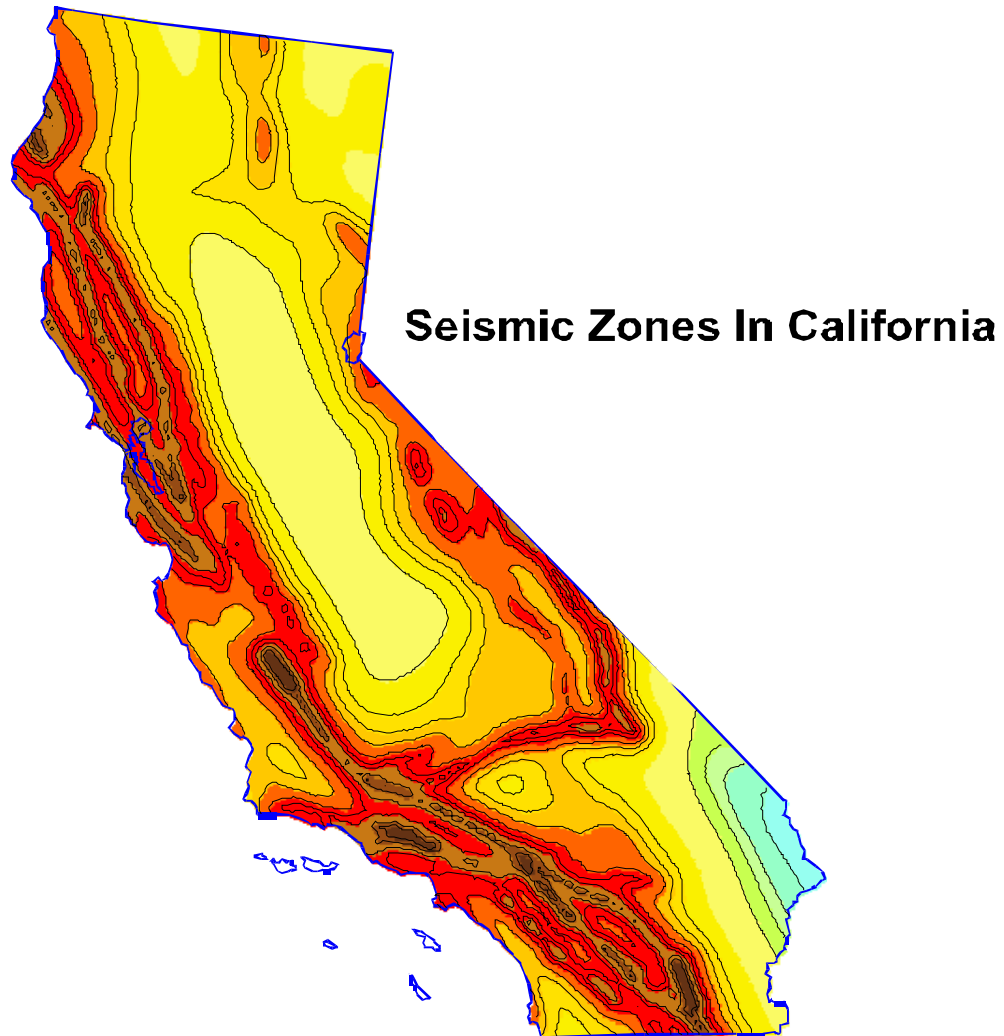
Liquefaction

Liquefaction occurs when ground shaking causes wet granular soils to change from a solid state to a liquid state. This results in the loss of soil strength and the soil's ability to support weight. Buildings and their occupants are at risk when the ground can no longer support these buildings and structures. Many communities in Southern California are built on ancient river bottoms and have sandy soil. In some cases this ground may be subject to liquefaction, depending on the depth of the water table.

Amplification

Soils and soft sedimentary rocks near the earth's surface can modify ground shaking caused by earthquakes. One of these modifications is amplification. Amplification increases the magnitude of the seismic waves generated by the earthquake. The amount of amplification is influenced by the thickness of geologic materials and their physical properties. Buildings and structures built on soft and unconsolidated soils can face greater risk.³ Amplification can also occur in areas with deep sediment filled basins and on ridge tops.

Map 5-1: Seismic Zones in California



Darker Shaded Areas indicate Greater Potential Shaking

Source: USGS Website

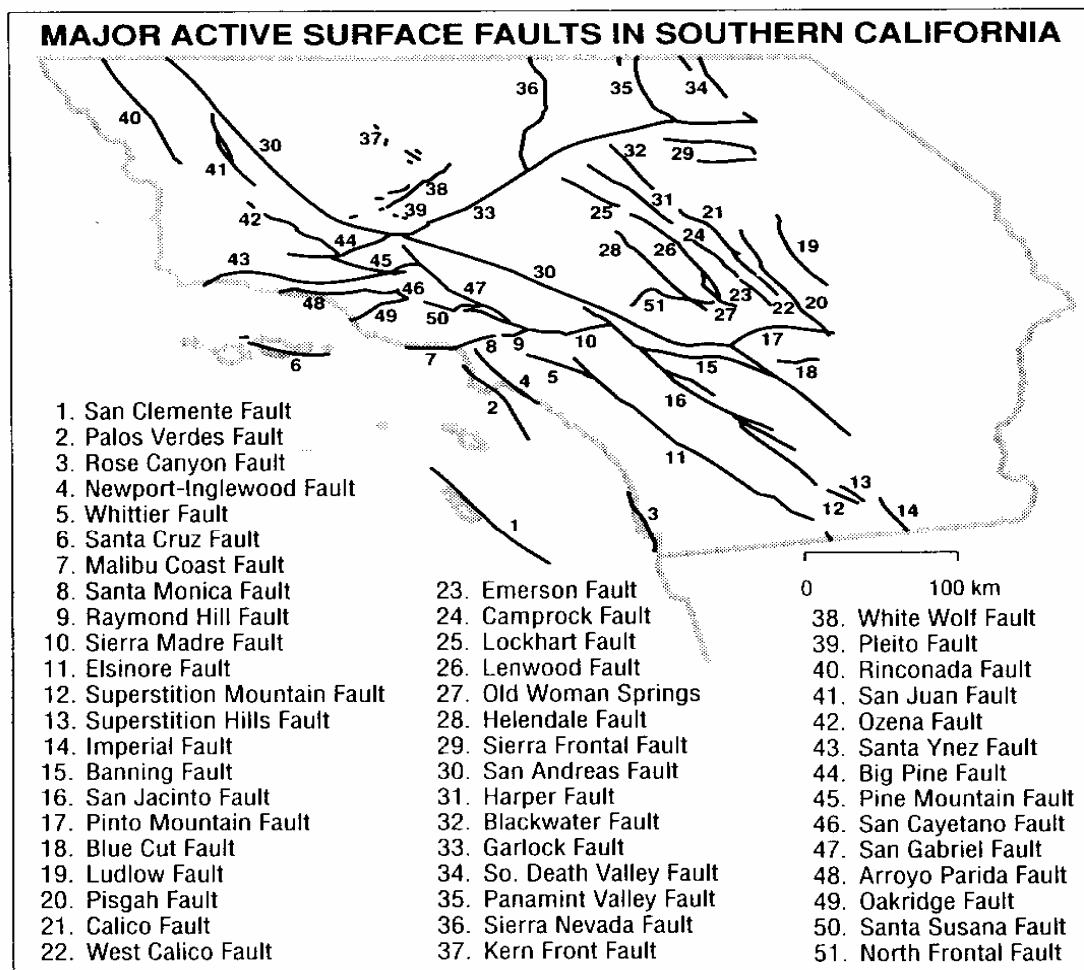
Earthquake Hazard Assessment

Hazard Identification

In California, many agencies are focused on seismic safety issues: the State's Seismic Safety Commission, the Applied Technology Council, Governor's Office of Emergency Services, United States Geological Survey, Cal Tech, the California Geological Survey as well as a number of universities and private foundations.

These organizations, in partnership with other state and federal agencies, have undertaken a rigorous program in California to identify seismic hazards and risks including active fault identification, bedrock shaking, tsunami inundation zones, ground motion amplification, liquefaction, and earthquake induced landslides. Seismic hazard maps have been published and are available for many communities in California through the State Division of Mines and Geology. Map 5-2 illustrates the known earthquake faults in Southern California.

Map 5-2: Major Active Surface Faults in Southern California



Source: Adapted from the map of major active Southern California surface faults published in "Seismic Hazards in Southern California: Probable Earthquakes, 1994-2024," Southern California Earthquake Center.

In California, each earthquake is followed by revisions and improvements in the Building Codes. The 1933 Long Beach Earthquake resulted in the Field Act, affecting school construction. The 1971 Sylmar Earthquake brought another set of increased structural standards. Similar re-evaluations occurred after the 1989 Loma Prieta and 1994 Northridge Earthquakes. These code changes have resulted in stronger and more earthquake resistant structures.

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. This state law was a direct result of the 1971 San Fernando Earthquake, which was associated with extensive surface fault ruptures that damaged numerous homes, commercial buildings, and other structures. Surface rupture is the most easily avoided seismic hazard.⁴

The Seismic Hazards Mapping Act, passed in 1990, addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically induced landslides.⁵ The State Department of Conservation operates the Seismic Mapping Program for California.

Extensive information is available at their website:

<http://gmw.consrv.ca.gov/shmp/index.htm>

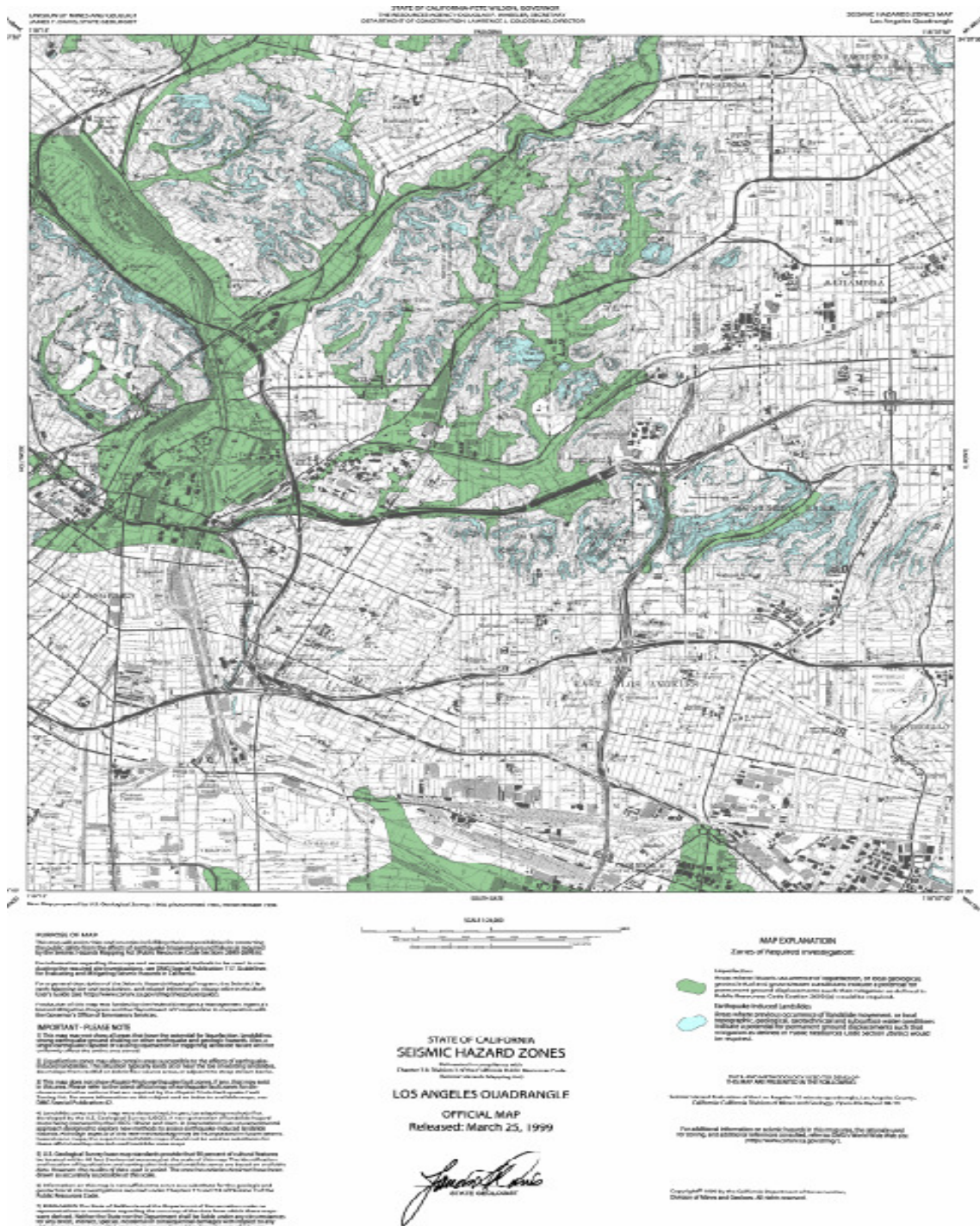
Vulnerability Assessment

The effects of earthquakes span a large area, and large earthquakes occurring in many parts of the Southern California region would probably be felt throughout the region. However, the degree to which the earthquakes are felt, and the damages associated with them may vary. At risk from earthquake damage are large stocks of old buildings and bridges; many high tech and hazardous materials facilities; extensive sewer, water, and natural gas pipelines; earth dams; petroleum pipelines; and other critical facilities and private property located in the county. The relative or secondary earthquake hazards, which are liquefaction, ground shaking, amplification, and earthquake-induced landslides, can be just as devastating as the earthquake.

The California Geological Survey has identified areas most vulnerable to liquefaction. Liquefaction occurs when ground shaking causes wet granular soils to change from a solid state to a liquid state. This results in the loss of soil strength and the soil's ability to support weight. Buildings and their occupants are at risk when the ground can no longer support these buildings and structures.

Much of the City is in a liquefaction-prone area as shown on Map 5-3: Liquefaction and EQ-Induced Landslide Area – Los Angeles Quadrangle and Map 5-4: Southgate Quadrangle.

Map 5-3: Liquefaction and EQ-Induced Landslide Areas in the City of Vernon
(Source: California Seismic Hazard Map – Los Angeles Quadrangle)
(Key: Green indicates area prone to liquefaction following earthquakes; Blue indicates area prone to landslides following earthquakes)



Southern California has many active landslide areas, and a large earthquake could trigger accelerated movement in these slide areas, in addition to jarring loose other unknown areas of landslide risk.

Risk Analysis

Risk analysis is the third phase of a hazard assessment. Risk analysis involves estimating the damage and costs likely to be experienced in a geographic area over a period of time⁶. Factors included in assessing earthquake risk include population and property distribution in the hazard area, the frequency of earthquake events, landslide susceptibility, buildings, infrastructure, and disaster preparedness of the region. This type of analysis can generate estimates of the damages to the region due to an earthquake event in a specific location. FEMA's software program, HAZUS, uses mathematical formulas and information about building stock, local geology and the location and size of potential earthquakes, economic data, and other information to estimate losses from a potential earthquake.⁷ The HAZUS software is available from FEMA at no cost.

For greater Southern California there are multiple worst case scenarios, depending on which fault might rupture, and which communities are in proximity to the fault. But damage will not necessarily be limited to immediately adjoining communities. Depending on the hypocenter of the earthquake, seismic waves may be transmitted through the ground to unsuspecting communities. In the 1994 Northridge Earthquake, Santa Monica suffered extensive damage, even though there was a range of mountains between it and the origin of the earthquake.

Damages for a large earthquake almost anywhere in Southern California are likely to run into the billions of dollars. Although building codes are some of the most stringent in the world, ten's of thousands of older existing buildings were built under much less rigid codes. California has laws affecting unreinforced masonry buildings (URM's) and although many building owners have retrofitted their buildings, hundreds of pre-1933 buildings still have not been brought up to current standards. The City of Vernon has 69 unreinforced masonry buildings.

Non-structural bracing of equipment and contents is often the most cost-effective type of seismic mitigation. Inexpensive bracing and anchoring may be the most cost effective way to protect expensive equipment. Non-structural bracing of equipment and furnishings will also reduce the chance of injury for the occupants of a building.

Community Earthquake Issues

What is Susceptible to Earthquakes?

Earthquake damage occurs because humans have built structures that cannot withstand severe shaking. Buildings, airports, schools, and lifelines (highways and utility lines) suffer damage in earthquakes and can cause death or injury to humans. The welfare of homes, major businesses, and public infrastructure is very important. Addressing the

reliability of buildings, critical facilities, and infrastructure, and understanding the potential costs to government, businesses, and individuals as a result of an earthquake, are challenges faced by the city.

Dams

There are a total of 103 dams in Los Angeles County, owned by 23 agencies or organizations, ranging from the Federal government to Homeowner's Associations.⁸ These dams hold billions of gallons of water in reservoirs. Releases of water from the major reservoirs are designed to protect Southern California from flood waters and to store domestic water. Seismic activity can compromise the dam structures, and the resultant flooding could cause catastrophic flooding. Following the 1971 Sylmar earthquake the Lower Van Norman Dam showed signs of structural compromise, and tens of thousands of persons had to be evacuated until the dam could be drained. The Dam was never refilled.

According to the City's MHFP Threat Assessment, the entire City is vulnerable to dam failure (see Section 6: Flooding).

Buildings

The built environment is susceptible to damage from earthquakes. Buildings that collapse can trap and bury people. Lives are at risk and the cost to clean up the damages is great. In most California communities, including the City of Vernon, many buildings were built before 1993 when building codes were not as strict. In addition, retrofitting is not required except under certain conditions and can be expensive. Therefore, the number of buildings at risk remains high. The California Seismic Safety Commission makes annual reports on the progress of the retrofitting of unreinforced masonry buildings.

Infrastructure and Communication

Residents in the City of Vernon commute frequently by automobiles and public transportation such as buses and light rail. An earthquake can greatly damage bridges and roads, hampering emergency response efforts and the normal movement of people and goods. Damaged infrastructure strongly affects the economy of the community because it disconnects people from work, school, food, and leisure, and separates businesses from their customers and suppliers.

Bridge Damage

Even modern bridges can sustain damage during earthquakes, leaving them unsafe for use. Some bridges have failed completely due to strong ground motion. Bridges are a vital transportation link - with even minor damages making some areas inaccessible. Because bridges vary in size, materials, location and design, any given earthquake will affect them differently. Bridges built before the mid-1970's have a significantly higher risk of suffering structural damage during a moderate to large earthquake compared with those built after 1980 when design improvements were made.

Much of the interstate highway system was built in the mid to late 1960's. The bridges in the City of Vernon are state, county, city or privately owned (including railroad bridges). CalTrans has retrofitted most bridges on the freeway systems; however there are still some county maintained bridges that are not retrofitted. The FHWA requires that bridges on the National Bridge Inventory be inspected every 2 years. CalTrans checks when the bridges are inspected because they administer the Federal funds for bridge projects.

Damage to Lifelines

Lifelines are the connections between communities and outside services. They include water and gas lines, transportation systems, electricity, and communication networks. Ground shaking and amplification can cause pipes to break open, power lines to fall, roads and railways to crack or move, and radio and telephone communication to cease. Disruption to transportation makes it especially difficult to bring in supplies or services. Lifelines need to be usable after earthquake to allow for rescue, recovery, and rebuilding efforts and to relay important information to the public.

As mentioned in Section: Community Profile, the City of Vernon is particularly vulnerable to pipeline ruptures because of the abundance of pipelines serving the industrial facilities. The City has several small natural gas pipelines and taps. The pipeline posing the greatest threat is a 26" diameter pipeline located on Downey Road. It runs north and south, the entire length of Downey Road, continuing into the City of Los Angeles to the north; to the south to Malburg Way, and into the City of Huntington Park.

There are also several small gasoline pipelines running throughout the City. The one of greatest concern is a 12" diameter pipeline owned by Mobil Oil, running from the western boundary of the City at Alameda Street; east on Slauson Avenue to Santa Fe Avenue; north to 38th Street; and east into the Mobil Oil Treatment Plant.

Disruption of Critical Services

Critical facilities include police stations, fire stations, hospitals, shelters, and other facilities that provide important services to the community. These facilities and their services need to be functional after an earthquake event. Some critical facilities are housed in older buildings that are not up to current seismic codes. See Section 4, Risk Assessment for critical and essential facilities vulnerable to earthquakes.

Businesses

Seismic activity can cause great loss to businesses, both large-scale corporations and small retail shops. When a company is forced to stop production for just a day, the economic loss can be tremendous, especially when its market is at a national or global level. Seismic activity can create economic loss that presents a burden to large and small shop owners who may have difficulty recovering from their losses.

Forty percent of businesses do not reopen after a disaster and another twenty-five percent fail within one year according to the Federal Emergency Management Agency (FEMA).

Similar statistics from the United States Small Business Administration indicate that over ninety percent of businesses fail within two years after being struck by a disaster.⁹

Individual Preparedness

Because the potential for earthquake occurrences and earthquake related property damage is relatively high in the City of Vernon, increasing individual preparedness is a significant need. Strapping down heavy furniture, water heaters, and expensive personal property, as well as being earthquake insured, and anchoring buildings to foundations are just a few steps individuals can take to prepare for an earthquake.

Death and Injury

Death and injury can occur both inside and outside of buildings due to collapsed buildings falling equipment, furniture, debris, and structural materials. Downed power lines and broken water and gas lines can also endanger human life.

Fire

Downed power lines or broken gas mains may trigger fires. When fire stations suffer building or lifeline damage, quick response to extinguish fires is less likely. Furthermore, major incidents will demand a larger share of resources, and initially smaller fires and problems will receive little or insufficient resources in the initial hours after a major earthquake event. Loss of electricity may cause a loss of water pressure in some communities, further hampering fire fighting ability.

Debris

After damage to a variety of structures, much time is spent cleaning up bricks, glass, wood, steel or concrete building elements, office and home contents, and other materials. Developing a strong debris management strategy is essential in post-disaster recovery. Disasters do not exempt the City of Vernon from compliance with AB 939 regulations.

Existing Mitigation Activities

Existing mitigation activities include current mitigation programs and activities that are being implemented by county, regional, state, or federal agencies or organizations.

City of Vernon Codes

Implementation of earthquake mitigation policy most often takes place at the local government level. The City of Vernon Building Division enforces building codes pertaining to earthquake hazards and has amended the California Building Code to take into account the findings from the Northridge Earthquake.

The following sections of the California Building Code address the earthquake hazard:

- 1606.2.1 (Distribution of Horizontal Shear);
- 1605.2.2 (Stability against Overturning);
- 1626 (Seismic);
- 1605.2.3 (Anchorage); and
- 1630, 1631, 1632, 1633 deal with specific seismic design.

The City of Vernon Planning Division enforces the zoning and land use regulations relating to earthquake hazards.

Generally, these codes seek to discourage development in areas that could be prone to flooding, landslide, wildfire and / or seismic hazards; and where development is permitted, that the applicable construction standards are met. Developers in hazard-prone areas may be required to retain a qualified professional engineer to evaluate level of risk on the site and recommend appropriate mitigation measures.

Coordination among Building Officials

The City of Vernon Building Code sets the minimum design and construction standards for new buildings. On September 8, 2002 the City of Vernon adopted the most recent seismic standards in its building code, which requires that new buildings be built at a higher seismic standard.

The City of Vernon also requires that site-specific seismic hazard investigations be performed for new essential facilities, major structures, hazardous facilities, and special occupancy structures such as schools, hospitals, and emergency response facilities.

Businesses/Private Sector

Natural hazards have a devastating impact on businesses. In fact, of all businesses which close following a disaster, more than forty-three percent never reopen, and an additional twenty-nine percent close for good within the next two years.¹⁰ The Institute of Business and Home Safety has developed “Open for Business”, which is a disaster planning toolkit to help guide businesses in preparing for and dealing with the adverse affects natural hazards. The kit integrates protection from natural disasters into the company's risk reduction measures to safeguard employees, customers, and the investment itself. The guide helps businesses secure human and physical resources during disasters, and helps to develop strategies to maintain business continuity before, during, and after a disaster occurs.

Hospitals

“The Alfred E. Alquist Hospital Seismic Safety Act (“Hospital Act”) was enacted in 1973 in response to the moderate Magnitude 6.6 Sylmar Earthquake in 1971 when four major hospital campuses were severely damaged and evacuated. Two hospital buildings collapsed killing forty seven people. Three others were killed in another hospital that nearly collapsed.

In approving the Act, the Legislature noted that: “Hospitals, that house patients who have less than the capacity of normally healthy persons to protect themselves, and that must be reasonably capable of providing services to the public after a disaster, shall be designed and constructed to resist, insofar as practical, the forces generated by earthquakes, gravity and winds.” (Health and Safety Code Section 129680)

When the Hospital Act was passed in 1973, the State anticipated that, based on the regular and timely replacement of aging hospital facilities, the majority of hospital buildings would be in compliance with the Act's standards within 25 years. However, hospital buildings were not, and are not, being replaced at that anticipated rate. In fact, the great majority of the State's urgent care facilities are now more than 40 years old.

The moderate Magnitude 6.7 Northridge Earthquake in 1994 caused \$3 billion in hospital-related damage and evacuations. Twelve hospital buildings constructed before the Act were cited (red tagged) as unsafe for occupancy after the earthquake. Those hospitals that had been built in accordance with the 1973 Hospital Act were very successful in resisting structural damage. However, nonstructural damage (for example, plumbing and ceiling systems) was still extensive in those post-1973 buildings.

Senate Bill 1953 ("SB 1953"), enacted in 1994 after the Northridge Earthquake, expanded the scope of the 1973 Hospital Act. Under SB 1953, all hospitals are required, as of January 1, 2008, to survive earthquakes without collapsing or posing the threat of significant loss of life. The 1994 Act further mandates that all existing hospitals be seismically evaluated, and retrofitted, if needed, by 2030, so that they are in substantial compliance with the Act (which requires that the hospital buildings be reasonably capable of providing services to the public after disasters). SB 1953 applies to all urgent care facilities (including those built prior to the 1973 Hospital Act) and affects approximately 2,500 buildings on 475 campuses.

SB 1953 directed the Office of Statewide Health Planning and Development ("OSHPD"), in consultation with the Hospital Building Safety Board, to develop emergency regulations including "...earthquake performance categories with sub gradations for risk to life, structural soundness, building contents, and nonstructural systems that are critical to providing basic services to hospital inpatients and the public after a disaster." (Health and Safety Code Section 130005)

The Seismic Safety Commission Evaluation of the State's Hospital Seismic Safety Policies

In 2001, recognizing the continuing need to assess the adequacy of policies, and the application of advances in technical knowledge and understanding, the California Seismic Safety Commission created an Ad Hoc Committee to re-examine the compliance with the Alquist Hospital Seismic Safety Act. The formation of the Committee was also prompted by the recent evaluations of hospital buildings reported to OSHPD that revealed that a large percentage (40%) of California's operating hospitals are in the highest category of collapse risk."¹¹

California Earthquake Mitigation Legislation

California is painfully aware of the threats it faces from earthquakes. Dating back to the 19th Century, Californians have been killed, injured, and lost property as a result of earthquakes. As the State's population continues to grow, and urban areas become even more densely developed, the risk will continue to increase. For decades the legislature has passed laws to strengthen the built environment and protect the citizens. Table 5-2 provides a sampling of some of the 200 plus laws in the State's codes.

Table 5-2: Partial List of the Over 200 California Laws on Earthquake Safety

Government Code Section 8870-8870.95	Creates Seismic Safety Commission.
Government Code Section 8876.1-8876.10	Established the California Center for Earthquake Engineering Research.
Public Resources Code Section 2800-2804.6	Authorized a prototype earthquake prediction system along the Central San Andreas Fault near the City of Parkfield.
Public Resources Code Section 2810-2815	Continued the Southern California Earthquake Preparedness Project and the Bay Area Regional Earthquake Preparedness Project.
Health and Safety Code Section 16100-16110	The Seismic Safety Commission and State Architect will develop a state policy on acceptable levels of earthquake risk for new and existing state-owned buildings.
Government Code Section 8871-8871.5	Established the California Earthquake Hazards Reduction Act of 1986.
Health and Safety Code Section 130000-130025	Defined earthquake performance standards for hospitals.
Public Resources Code Section 2805-2808	Established the California Earthquake Education Project.
Government Code Section 8899.10-8899.16	Established the Earthquake Research Evaluation Conference.
Public Resources Code Section 2621-2630 2621.	Established the Alquist-Priolo Earthquake Fault Zoning Act.
Government Code Section 8878.50-8878.52 8878.50.	Created the Earthquake Safety and Public Buildings Rehabilitation Bond Act of 1990.
Education Code Section 35295-35297 35295.	Established emergency procedure systems in kindergarten through grade 12 in all the public or private schools.
Health and Safety Code Section 19160-19169	Established standards for seismic retrofitting of unreinforced masonry buildings.
Health and Safety Code Section 1596.80-1596.879	Required all child day care facilities to include an Earthquake Preparedness Checklist as an attachment to their disaster plan.
Source: http://www.leginfo.ca.gov/calaw.html	

Earthquake Education

Earthquake research and education activities are conducted at several major universities in the Southern California region, including Cal Tech, USC, UCLA, UCSB, UCI, and UCSB. The local clearinghouse for earthquake information is the Southern California Earthquake Center located at the University of Southern California, Los Angeles, CA 90089, Telephone: (213) 740-5843, Fax: (213) 740-0011, Email: SCEinfo@usc.edu, Website: <http://www.scec.org>. The Southern California Earthquake Center (SCEC) is a community of scientists and specialists who actively coordinate research on earthquake

hazards at nine core institutions, and communicate earthquake information to the public. SCEC is a National Science Foundation (NSF) Science and Technology Center and is co-funded by the United States Geological Survey (USGS).

In addition, Los Angeles County along with other Southern California counties, sponsors the Emergency Survival Program (ESP), an educational program for learning how to prepare for earthquakes and other disasters. Many school districts have very active emergency preparedness programs that include earthquake drills and periodic disaster response team exercises.

End Notes

¹ <http://pubs.usgs.gov/gip/earthq3/when.html>

² <http://www.gps.caltech.edu/~sieh/home.html>

³ Planning for Natural Hazards: The California Technical Resource Guide, Department of Land Conservation and Development (July 2000)

⁴ <http://www.consrv.ca.gov/CGS/rghm/ap/>

⁵ Ibid

⁶ Burby, R. (Ed.) Cooperating with Nature: Confronting Natural Hazards with Land Use Planning for Sustainable Communities (1998), Washington D.C., Joseph Henry Press.

⁷ FEMA HAZUS <http://www.fema.gov/hazus/hazus2.htm> (May 2001).

⁸ Source: Los Angeles County Public Works Department, March 2004

⁹ http://www.chamber101.com/programs_committee/natural_disasters/DisasterPreparedness/Forty.htm

¹⁰ Institute for Business and Home Safety Resources (April 2001),

¹¹ http://www.seismic.ca.gov/pub/CSSC_2001-04_Hospital.pdf

Section 6: Flooding Hazards in the City of Vernon

Why are Floods a Threat to the City of Vernon?

The City of Vernon is bisected by the Los Angeles River, which is channelized but potentially susceptible to overflow flooding events. Urban flooding poses a perhaps a greater threat to life and safety, and can cause damage to public and private property.

History of Flooding in the City of Vernon

The City of Vernon is susceptible to flooding resulting from overflow of the channelized Los Angeles River or from excessive rainfall. Since the rivers channelization, the City has been spared significant impact from major flooding, however the potential for urban flooding is worthy of consideration.

There are a number of rivers in the Southern California region, but the river with the best recorded history is the Los Angeles River. The flood history of the Los Angeles River is generally indicative of the flood history of much of Southern California.

Historic Flooding in Los Angeles County

Records show that since 1811, the Los Angeles River has flooded 30 times, on average once every 6.1 years. But averages are deceiving, for the Los Angeles Basin goes through periods of drought and then periods of above average rainfall. Between 1889 and 1891 the river flooded every year, and from 1941 to 1945, the river flooded 5 times. Conversely, from 1896 to 1914, a period of 18 years, and again from 1944 to 1969, a period of 25 years, the river did not have serious floods.¹

Table 6-1: Major Floods of the Los Angeles River

Major Floods of the Los Angeles River	
1811	Flooding
1815	Flooding
1825	L.A. River changed its course back from the Ballona wetlands to San Pedro
1832	Heavy flooding
1861-62	Heavy flooding. Fifty inches of rain falls during December and January.
1867	Floods create a large, temporary lake out to Ballona Creek.
1876	The Novician Deluge
1884	Heavy flooding causes the river to change course again, turning east to Vernon and then southward to San Pedro.
1888-1891	Annual floods
1914	Heavy flooding. Great damage to the harbor.
1921	Flooding
1927	Moderate flood
1934	Moderate flood starting January 1. Forty dead in La Canada.
1938	Great County-wide flood with 4 days of rain. Most rain on day 4.
1941-44	L.A. River floods five times.
1952	Moderate flooding
1969	One heavy flood after 9 day storm. One moderate flood.
1978	Two moderate floods
1979	Los Angeles experiences severe flooding and mudslides.
1980	Flood tops banks of river in Long Beach. Sepulveda Basin spillway almost opened.
1983	Flooding kills six people.
1992	15 year flood. Motorists trapped in Sepulveda basin. Six people dead.
1994	Heavy flooding
Sources: http://www.lalc.k12.ca.us/target/units/river/tour/hist.html and (http://www.losangelesalmanac.com/topics/History/hi01i.htm)	

The towering mountains that give the Los Angeles region its spectacular views also wring a great deal of rain out of the storm clouds that pass through. Because the mountains are so steep, the rainwater moves rapidly down the slopes and across the coastal plains on its way to the ocean.

“The Santa Monica, Santa Susana and Verdugo Mountains, which surround three sides of the valley, seldom reach heights above three thousand feet. The Western San Gabriel Mountains, in contrast, have elevations of more than seven thousand feet. These higher ridges often trap eastern-moving winter storms. Although downtown Los Angeles averages just fifteen inches of rain a year, some mountain peaks in the San Gabriels receive more than forty inches of precipitation annually”²

Naturally, this rainfall moves rapidly down stream, often with severe consequences for anything in its path. In extreme cases, flood-generated debris flows will roar down a canyon at speeds near 40 miles per hour with a wall of mud, debris and water tens of feet high.

In Southern California, stories of floods, debris flows, persons buried alive under tons of mud and rock and persons swept away to their death in a river flowing at thirty-five miles an hour are without end.

What Factors Create Flood Risk?

Flooding occurs when climate, geology, and hydrology combine to create conditions where water flows outside of its usual course. In the City of Vernon, geography and climate combine to create occasional seasonal flooding conditions.

Winter Rainfall

Over the last 125 years, the average annual rainfall in Los Angeles is 14.9 inches. But the term “average” means very little as the annual rainfall during this time period has ranged from only 4.35 inches in 2001-2002 to 38.2 inches in 1883-1884. In fact, in only fifteen of the past 125 years, has the annual rainfall been within plus or minus 10% of the 14.9 inch average. And in only 38 years has the annual rainfall been within plus or minus 20% of the 14.9 inch average. This makes the Los Angeles basin a land of extremes in terms of annual precipitation.

Monsoons

Another relatively regular source for heavy rainfall, particularly in the mountains and adjoining cities is from summer tropical storms. Table 6-2 lists tropical storms that have had significant rainfall in the past century, and the general areas affected by these storms. These tropical storms usually coincide with El Niño years.

Table 6-2: Tropical Cyclones of Southern California

Tropical cyclones that have affected Southern California during the 20th Century			
Month-Year	Date(s)	Area(s) Affected	Rainfall
July 1902	20th & 21 st	Deserts & Southern Mountains	up to 2"
Aug. 1906	18th & 19th	Deserts & Southern Mountains	up to 5"
Sept. 1910	15th	Mountains of Santa Barbara County	2"
Aug. 1921	20th & 21st	Deserts & Southern Mountains	up to 2"
Sept. 1921	30th	Deserts	up to 4"
Sept. 1929	18th	Southern Mountains & Deserts	up to 4"
Sept. 1932	28 th - Oct 1st	Mountains & Deserts, 15 Fatalities	up to 7"
Aug. 1935	25th	Southern Valleys, Mountains & Deserts	up to 2"
Sept. 1939	4th - 7th	Southern Mountains, Southern & Eastern Deserts	up to 7"
	11th & 12th	Deserts, Central & Southern Mountains	up to 4"
	19th - 21st	Deserts, Central & Southern Mountains	up to 3"
	25th	Long Beach, W/ Sustained Winds of 50 Mph	5"
		Surrounding Mountains	6 to 12"
Sept. 1945	9th & 10th	Central & Southern Mountains	up to 2"
Sept. 1946	30 th - Oct 1 st	Southern Mountains	up to 4"
Aug. 1951	27th - 29th	Southern Mountains & Deserts	2 to 5"
Sept. 1952	19th - 21st	Central & Southern Mountains	up to 2"
July 1954	17th - 19th	Deserts & Southern Mountains	up to 2"
July 1958	28th & 29th	Deserts & Southern Mountains	up to 2"
Sept. 1960	9th & 10th	Julian	3.40"
Sept. 1963	17th - 19th	Central & Southern Mountains	up to 7"
Sept. 1967	1st - 3rd	Southern Mountains & Deserts	2"
Oct. 1972	6th	Southeast Deserts	up to 2"

Tropical cyclones that have affected Southern California during the 20th Century			
Sept. 1976	10th & 11th	Central & Southern Mountains. Ocotillo, CA was Destroyed 3 Fatalities	6 to 12"
Aug. 1977	n/a	Los Angeles	2"
		Mountains	up to 8"
Oct. 1977	6th & 7th	Southern Mountains & Deserts	up to 2
Sept. 1978	5th & 6th	Mountains	3"
Sept. 1982	24th - 26th	Mountains	up to 4"
Sept. 1983	20th & 21st	Southern Mountains & Deserts	up to 3"
http://www.fema.gov/nwz97/el_n_scal.shtm			

Geography and Geology

The greater Los Angeles Basin is the product of rainstorms and erosion for millennia. "Most of the mountains that ring the valleys and coastal plain are deeply fractured faults and, as they (the mountains) grew taller, their brittle slopes were continually eroded. Rivers and streams carried boulders, rocks, gravel, sand, and silt down these slopes to the valleys and coastal plain.... In places these sediments are as much as twenty thousand feet thick"³

Much of the coastal plain rests on the ancient rock debris and sediment washed down from the mountains. This sediment can act as a sponge, absorbing vast quantities of rain in those years when heavy rains follow a dry period. But like a sponge that is near saturation, the same soil fills up rapidly when a heavy rain follows a period of relatively wet weather. So even in some years of heavy rain, flooding is minimal because the ground is relatively dry. The same amount of rain following a wet period of time can cause extensive flooding.

The greater Los Angeles Basin is for all intents and purposes developed. This leaves precious little open land to absorb rainfall. This lack of open ground forces water to remain on the surface and rapidly accumulate. If it were not for the massive flood control system with its concrete lined river and stream beds, flooding would be a much more common occurrence. And the tendency is towards even less and less open land. In-fill building is becoming a much more common practice in many areas. Developers tear down an older home which typically covers up to 40% of the lot size and replacing it with three or four town homes or apartments, which may cover 90-95% of the lot.

Another potential source of flooding is "asphalt creep." The street space between the curbs of a street is a part of the flood control system. Water leaves property and accumulates in the streets, where it is directed towards the underground portion of the flood control system. The carrying capacity of the street is determined by the width of the street and the height of the curbs along the street. Often, when streets are being

resurfaced, a one to two inch layer of asphalt is laid down over the existing asphalt. This added layer of asphalt subtracts from the rated capacity of the street to carry water. Thus the original engineered capacity of the entire storm drain system is marginally reduced over time. Subsequent re-paving of the street will further reduce the engineered capacity even more.

Flood Terminology

Floodplain

A floodplain is a land area adjacent to a river, stream, lake, estuary, or other water body that is subject to flooding. This area, if left undisturbed, acts to store excess flood water. The floodplain is made up of two sections: the floodway and the flood fringe.

100-Year Flood

The 100-year flooding event is the flood having a one percent chance of being equaled or exceeded in magnitude in any given year. Contrary to popular belief, it is not a flood occurring once every 100 years. The 100-year floodplain is the area adjoining a river, stream, or watercourse covered by water in the event of a 100-year flood.

According to the Vernon General Plan, the potential for flooding, specifically a 50-year and 100-year flood, within the City is low risk. The National Flood Insurance Program has classified the City of Vernon as “Zone C” indicating minimal flood hazard. The City does not contain any specific areas, which are considered to be at special risk.

However in terms of local ponding, which occurs during urban flooding (localized or site specific), the level of risk is moderate. According to the General Plan, the local ponding risk is identified as follows: “specific action is required to protect life and property.”

Floodway

The floodway is one of two main sections that make up the floodplain. Floodways are defined for regulatory purposes. Unlike floodplains, floodways do not reflect a recognizable geologic feature. For NFIP purposes, floodways are defined as the channel of a river or stream, and the overbank areas adjacent to the channel. The floodway carries the bulk of the flood water downstream and is usually the area where water velocities and forces are the greatest. NFIP regulations require that the floodway be kept open and free from development or other structures that would obstruct or divert flood flows onto other properties.

Characteristics of Flooding

Two types of flooding have the potential to affect the City of Vernon: riverine flooding and urban flooding. In addition, any low-lying area has the potential to flood. The flooding of developed areas may occur when the amount of water generated from rainfall and runoff exceeds a storm water system’s capability to remove it.

Riverine Flooding

Riverine flooding is the overbank flooding of rivers and streams. The natural processes of riverine flooding add sediment and nutrients to fertile floodplain areas. Flooding in large river systems typically results from large-scale weather systems that generate prolonged rainfall over a wide geographic area, causing flooding in hundreds of smaller streams, which then drain into the major rivers.

Shallow area flooding is a special type of riverine flooding. FEMA defines shallow flood hazards as areas that are inundated by the 100-year flood with flood depths of only one to three feet. These areas are generally flooded by low velocity sheet flows of water.

Urban Flooding

As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Urbanization of a watershed changes the hydrologic systems of the basin. Heavy rainfall collects and flows faster on impervious concrete and asphalt surfaces. The water moves from the clouds, to the ground, and into streams at a much faster rate in urban areas. Adding these elements to the hydrological systems can result in flood waters that rise very rapidly and peak with violent force.

Almost 100% of the area in the City of Vernon has a high concentration of impermeable surfaces that either collect water, or concentrate the flow of water in unnatural channels. During periods of urban flooding, streets can become swift moving rivers and basements can fill with water. Storm drains could back up with vegetative debris causing additional, localized flooding.

Dam Failure Flooding

Loss of life and damage to structures, roads, and utilities may result from a dam failure. Economic losses can also result from a lowered tax base and lack of utility profits. These effects would certainly accompany the failure of one of the major dams in the City of Vernon.

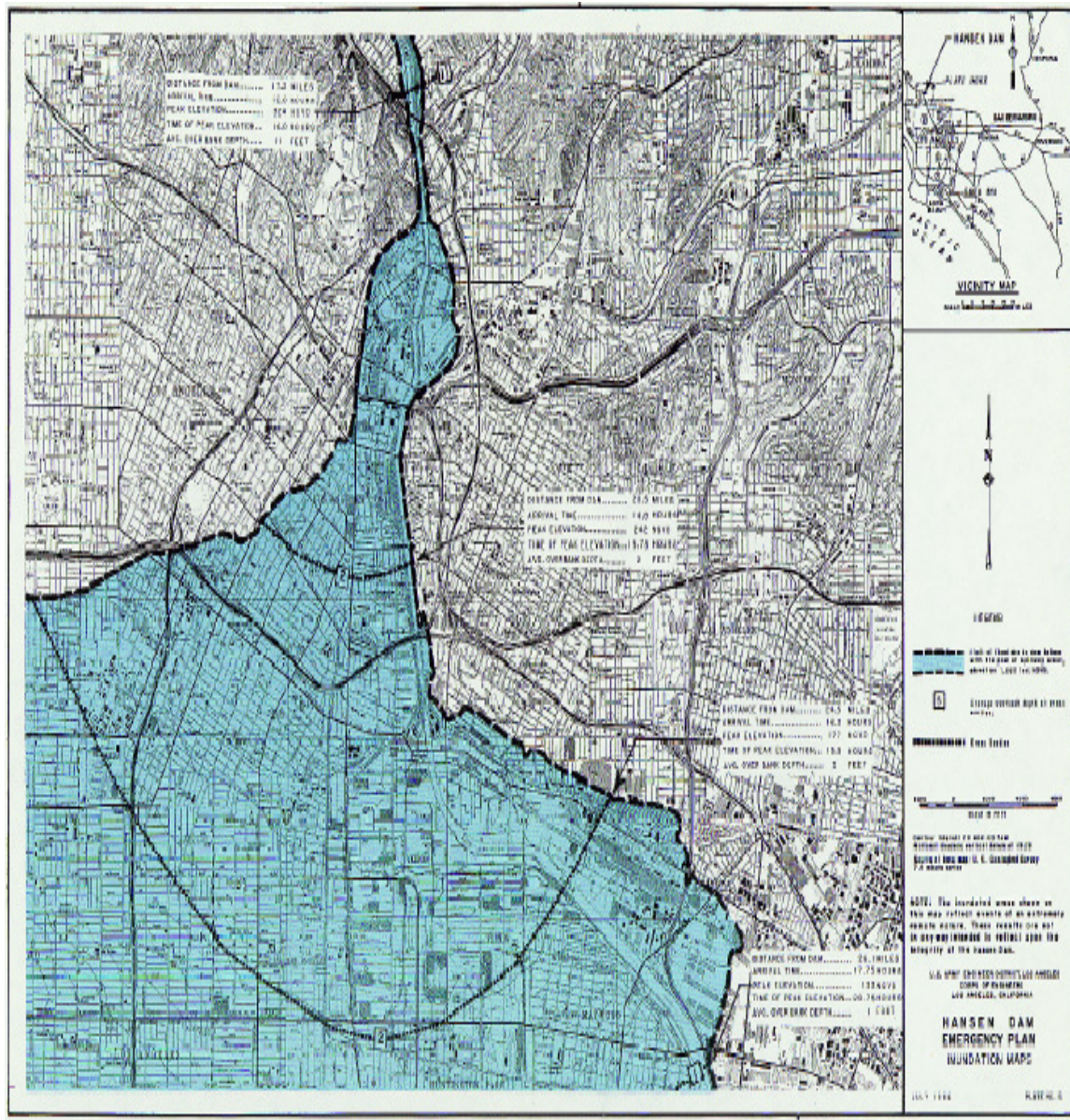
According to the City's MHFP Threat Assessment the entire City is vulnerable to dam failure. The two major dams which could significantly impact the City in the event of failure are Hansen Dam and Sepulveda Dam. Neither of these dams is located in the City.

Sepulveda Dam is the western-most of the Corps of Engineers projects in the Los Angeles County Drainage Area (LACDA) flood control system. The purpose of the project is to collect flood runoff from the uncontrolled drainage areas upstream, store it temporarily, and release it to the Los Angeles River at a rate that does not exceed the downstream channel capacity. The project has eight outlet passages, of which, only four have gates. Because the other four passages have no gates, Sepulveda Dam cannot "shut off" flow to the Los Angeles River.

[illegible]

Hansen Dam is an essential element for flood control in the Los Angeles County Drainage Area (LACDA). In conjunction with Sepulveda Dam and Lopez Dam, it is vital for the flood control protection of the lower portions of the San Fernando Valley and the City of Los Angeles. The project was built by the Corps of Engineers, Los Angeles District between September 1939 and September 1940. The project is located near the northern edge of the San Fernando Valley on Tujunga Wash, about one mile below the confluence of the Big Tujunga Wash and the Little Tujunga Wash, and about four miles southeast of the City of San Fernando. Hansen Dam is approximately 3.5 miles northwest of Lopez Dam.

Map 6- 3 Hansen Dam Inundation Map (Source: U.S. Army Corps of Engineers)



Because dam failure can have severe consequences, FEMA requires that all dam owners develop Emergency Action Plans (EAP) for warning, evacuation, and post-flood actions. Although there may be coordination with county officials in the development of the EAP, the responsibility for developing potential flood inundation maps and facilitation of emergency response is the responsibility of the dam owner. For more detailed information regarding dam failure flooding, and potential flood inundation zones for a particular dam in the county, refer to the facility's Emergency Action Plan.

There have been a total of 45 dam failures in California, since the 19th century. The significant dam failures in Southern California are listed in Table 6-3.

Table 6-3: Dam Failures in Southern California

Dam Failures in Southern California			
Sheffield	Santa Barbara	1925	Earthquake slide
Puddingstone	Pomona	1926	Overtopping during construction
Lake Hemet	Palm Springs	1927	Overtopping
Saint Francis	San Francisquito Canyon	1928	Sudden failure at full capacity through foundation, 426 deaths
Cogswell	Monrovia	1934	Breaching of concrete cover
Baldwin Hills	Los Angeles	1963	Leak through embankment turned into washout, 3 deaths
http://cee.engr.ucdavis.edu/faculty/lund/dams/Dam_History_Page/Failures.htm			

The two most significant dam failures are the St. Francis Dam in 1928 and the Baldwin Hills Dam in 1963.

“The failure of the St. Francis Dam, and the resulting loss of over 500 lives in the path of a roaring wall of water, was a scandal that resulted in the almost complete destruction of the reputation of its builder, William Mulholland.

Mulholland was an immigrant from Ireland who rose up through the ranks of the city's water department to the position of chief engineer. It was he who proposed, designed, and supervised the construction of the Los Angeles Aqueduct, which brought water from the Owens Valley to the city. The St. Francis Dam, built in 1926, was 180 feet high and 600 feet long; it was located near Saugus in the San Francisquito Canyon.

The dam gave way on March 12, 1928, three minutes before midnight. Its waters swept through the Santa Clara Valley toward the Pacific Ocean, about 54 miles away. 65 miles of valley was devastated before the water

finally made its way into the ocean between Oxnard and Ventura. At its peak the wall of water was said to be 78 feet high; by the time it hit Santa Paula, 42 miles south of the dam, the water was estimated to be 25 feet deep. Almost everything in its path was destroyed: livestock, structures, railways, bridges, and orchards. By the time it was over, parts of Ventura County lay under 70 feet of mud and debris. Over 500 people were killed and damage estimates topped \$20 million.”⁴

The Baldwin Hills dam failed during the daylight hours, and was one of the first disaster events documented by a live helicopter broadcast.

“The Baldwin Hills Dam collapsed with the fury of a thousand cloudbursts, sending a 50-foot wall of water down Cloverdale Avenue and slamming into homes and cars on December 14, 1963.

Five people were killed. Sixty-five hillside houses were ripped apart, and 210 homes and apartments were damaged. The flood swept northward in a V-shaped path roughly bounded by La Brea Avenue and Jefferson and La Cienega boulevards.

Photo 6-1: Baldwin Hills Dam



Baldwin Hills Dam - Dark spot in upper right hand quadrant shows the beginning of the break in the dam.

The earthen dam that created a 19-acre reservoir to supply drinking water for West Los Angeles residents ruptured at 3:38 p.m. As a pencil-thin crack widened to a 75-foot gash, 292 million gallons surged out. It took 77 minutes for the lake to empty. But it took a generation for the neighborhood below to recover. And

two decades passed before the Baldwin Hills ridge top was reborn.

The cascade caused an unexpected ripple effect that is still being felt in Los Angeles and beyond. It foreshadowed the end of urban-area earthen dams as a major element of the Department of Water and Power's water storage system. It prompted a tightening of Division of Safety of Dams control over reservoirs throughout the state.

The live telecast of the collapse from a KTLA-TV helicopter is considered the precursor to airborne news coverage that is now routine everywhere.”⁵

Debris Flows

Another flood related hazard that can affect certain parts of the Southern California region are debris flows. Most typically debris flows occur in mountain canyons and the foothills against the San Gabriel Mountains. However, any hilly or mountainous area with intense rainfall and the proper geologic conditions may experience one of these very sudden and devastating events.

“Debris flows, sometimes referred to as mudslides, mudflows, lahars, or debris avalanches, are common types of fast-moving landslides. These flows generally occur during periods of intense rainfall or rapid snow melt. They usually start on steep hillsides as shallow landslides that liquefy and accelerate to speeds that are typically about 10 miles per hour, but can exceed 35 miles per hour. The consistency of debris flow ranges from watery mud to thick, rocky mud that can carry large items such as boulders, trees, and cars. Debris flows from many different sources can combine in channels, and their destructive power may be greatly increased. They continue flowing down hills and through channels, growing in volume with the addition of water, sand, mud, boulders, trees, and other materials. When the flows reach flatter ground, the debris spreads over a broad area, sometimes accumulating in thick deposits that can wreak havoc in developed areas.”⁶

Coastal Flooding

Low lying coastal communities of Southern California have one other source of flooding, coastal flooding. This occurs most often during storms which bring higher than normal tides. Storms, the time of year and the tidal cycle can sometimes work to bring much higher than normal tides which cause flooding in low lying coastal areas. This hazard however is limited to those areas.

What is the Effect of Development on Floods?

When structures or fill are placed in the floodway or floodplain water is displaced. Development raises the river levels by forcing the river to compensate for the flow space obstructed by the inserted structures and/or fill. When structures or materials are added to the floodway or floodplain and no fill is removed to compensate, serious problems can arise. Flood waters may be forced away from historic floodplain areas. As a result, other

existing floodplain areas may experience flood waters that rise above historic levels. Local governments must require engineer certification to ensure that proposed developments will not adversely affect the flood carrying capacity of the Special Flood Hazard Area (SFHA). Displacement of only a few inches of water can mean the difference between no structural damage occurring in a given flood event, and the inundation of many homes, businesses, and other facilities. Careful attention should be given to development that occurs within the floodway to ensure that structures are prepared to withstand base flood events. In highly urbanized areas, increased paving can lead to an increase in volume and velocity of runoff after a rainfall event, exacerbating the potential flood hazards. Care should be taken in the development and implementation of storm water management systems to ensure that these runoff waters are dealt with effectively.

How are Flood-Prone Areas Identified?

Flood maps and Flood Insurance Studies (FIS) are often used to identify flood-prone areas. The NFIP was established in 1968 as a means of providing low-cost flood insurance to the nation's flood-prone communities. The NFIP also reduces flood losses through regulations that focus on building codes and sound floodplain management.

Flood Insurance Rate Maps (FIRM) and Flood Insurance Studies (FIS) Floodplain maps are the basis for implementing floodplain regulations and for delineating flood insurance purchase requirements. A Flood Insurance Rate Map (FIRM) is the official map produced by FEMA which delineates SFHA in communities where NFIP regulations apply. FIRMs are also used by insurance agents and mortgage lenders to determine if flood insurance is required and what insurance rates should apply.

Water surface elevations are combined with topographic data to develop FIRMs. FIRMs illustrate areas that would be inundated during a 100-year flood, floodway areas, and elevations marking the 100-year-flood level. In some cases they also include base flood elevations (BFEs) and areas located within the 500-year floodplain. Flood Insurance Studies and FIRMs produced for the NFIP provide assessments of the probability of flooding at a given location. FEMA conducted many Flood Insurance Studies in the late 1970s and early 1980s. These studies and maps represent flood risk at the point in time when FEMA completed the studies. However, it is important to note that not all 100-year or 500-year floodplains have been mapped by FEMA. Since Vernon is not within the 100 year flood plain no FEMA maps have been produced.

FEMA flood maps are not entirely accurate. These studies and maps represent flood risk at the point in time when FEMA completed the studies, and does not incorporate planning for floodplain changes in the future due to new development. Although FEMA is considering changing that policy, it is optional for local communities.

Flood Mapping Methods and Techniques

Although many communities rely exclusively on FIRMs to characterize the risk of flooding in their area, there are some flood-prone areas that are not mapped but remain susceptible to flooding. These areas include locations next to small creeks, local drainage

areas, and areas susceptible to manmade flooding.

Communities find it particularly useful to overlay flood hazard areas on tax assessment parcel maps. This allows a community to evaluate the flood hazard risk for a specific parcel during review of a development request. Coordination between FEMA and local planning jurisdictions is the key to making a strong connection with GIS technology for the purpose of flood hazard mapping.

FEMA and the Environmental Systems Research Institute (ESRI), a private company, have formed a partnership to provide multi-hazard maps and information to the public via the Internet. ESRI produces GIS software, including ArcViewC9 and ArcInfoC9. The ESRI web site has information on GIS technology and downloadable maps. The hazards maps provided on the ESRI site are intended to assist communities in evaluating geographic information about natural hazards. Flood information for most communities is available on the ESRI web site. Visit www.esri.com for more information.

Hazard Assessment

Hazard Identification

Hazard identification is the first phase of flood-hazard assessment. Identification is the process of estimating: (1) the geographic extent of the floodplain (i.e., the area at risk from flooding); (2) the intensity of the flooding that can be expected in specific areas of the floodplain; and (3) the probability of occurrence of flood events. This process usually results in the creation of a floodplain map. Floodplain maps provide detailed information that can assist jurisdictions in making policies and land-use decisions.

Data Sources

FEMA mapped the 100 -year and 500-year floodplains through the Flood Insurance Study (FIS) in conjunction with the United States Army Corps of Engineers (USACE) in August of 1987. There were previous studies done, including a Housing and Urban Development (HUD) study, which mapped the floodplain, this is when the City of Vernon initially entered into the NFIP. The county has updated portions of the USACE and FEMA maps through smaller drainage studies in the county since that time.

Vulnerability Assessment

Vulnerability assessment is the second step of flood-hazard assessment. It combines the floodplain boundary, generated through hazard identification, with an inventory of the property within the floodplain. Understanding the population and property exposed to natural hazards will assist in reducing risk and preventing loss from future events. Because site-specific inventory data and inundation levels given for a particular flood event (10-year, 25-year, 50-year, 100-year, 500-year) are not readily available, calculating a community's vulnerability to flood events is not straightforward. The amount of property in the floodplain, as well as the type and value of structures on those properties, should be calculated to provide a working estimate for potential flood losses.

Disruption of Critical Services

Critical facilities include police stations, fire stations, hospitals, shelters, and other facilities that provide important services to the community. These facilities and their services need to be functional after a flooding event. Vulnerability of these facilities is indicated on Table 4-2 in Section 4, Risk Assessment.

Risk Analysis

Risk analysis is the third and most advanced phase of a hazard assessment. It builds upon the hazard identification and vulnerability assessment. A flood risk analysis for the City of Vernon should include two components: (1) the life and value of property that may incur losses from a flood event (defined through the vulnerability assessment); and (2) the number and type of flood events expected to occur over time. Within the broad components of a risk analysis, it is possible to predict the severity of damage from a range of events. Flow velocity models can assist in predicting the amount of damage expected from different magnitudes of flood events. The data used to develop these models is based on hydrological analysis of landscape features. Changes in the landscape, often associated with human development, can alter the flow velocity and the severity of damage that can be expected from a flood event.

Using GIS technology and flow velocity models, it is possible to map the damage that can be expected from flood events over time. It is also possible to pinpoint the effects of certain flood events on individual properties. At the time of publication of this plan, data was insufficient to conduct a risk analysis for flood events in the City of Vernon. However, the current mapping projects will result in better data that will assist in understanding risk. This plan includes recommendations for building partnerships that will support the development of a flood risk analysis in the City of Vernon.

Community Flood Issues

What is Susceptible to Damage during a Flood Event?

The largest impact on communities from flood events is the loss of life and property. During certain years, property losses resulting from flood damage are extensive. Due to a well designed drainage system flood damage during the past twenty five years have been very minor.

Property Loss Resulting from Flooding Events

The type of property damage caused by flood events depends on the depth and velocity of the flood waters. Faster moving flood waters can wash buildings off their foundations and sweep cars downstream. Pipelines, bridges, and other infrastructure can be damaged when high waters combine with flood debris. Extensive damage can be caused by basement flooding and landslide damage related to soil saturation from flood events. Most flood damage is caused by water saturating materials susceptible to loss (i.e. wood, insulation, wallboard, fabric, furnishings, floor coverings, and appliances). In many cases, flood damage to homes renders them unlivable.

Mobilehomes

Statewide, the 1996 floods destroyed 156 housing units. Of those units, 61% were mobilehomes and trailers. Many older mobilehome parks are located in floodplain areas. Mobilehomes have a lower level of structural stability than stick-built homes, and must be anchored to provide additional structural stability during flood events. Because of confusion in the late 1980s resulting from multiple changes in NFIP regulations, there are some communities that do not actively enforce anchoring requirements. Lack of enforcement of mobilehome construction standards in floodplains can contribute to severe damages from flood events.

According to the City of Vernon Planning Division, there are no mobilehome parks in the City.

Business/Industry

Flood events impact businesses by damaging property and by interrupting business. Flood events can cut off customer access to a business as well as close a business for repairs. A quick response to the needs of businesses affected by flood events can help a community maintain economic vitality in the face of flood damage. Responses to business damages can include funding to assist owners in elevating or relocating flood-prone business structures.

Public Infrastructure

Publicly owned facilities are a key component of daily life for all citizens of the county. Damage to public water and sewer systems, transportation networks, flood control facilities, emergency facilities, and offices can hinder the ability of the government to deliver services. Government can take action to reduce risk to public infrastructure from flood events, as well as craft public policy that reduces risk to private property from flood events.

Roads

During natural hazard events, or any type of emergency or disaster, dependable road connections are critical for providing emergency services. Roads systems in the City of Vernon are maintained by multiple jurisdictions. Federal, state, county, and city governments all have a stake in protecting roads from flood damage. Road networks often traverse floodplain and floodway areas. Transportation agencies responsible for road maintenance are typically aware of roads at risk from flooding.

Bridges

Bridges are key points of concern during flood events because they are important links in road networks, river crossings, and they can be obstructions in watercourses, inhibiting the flow of water during flood events. Bridges in the City of Vernon are state, county, city, and privately owned. A state-designated inspector must inspect all state, county, and city bridges every two years. The inspections are rigorous, looking at everything from seismic capability to erosion and scour.

The highest priority bridges in the City of Vernon are currently being considered for retrofit. These bridges include:

Soto Street Bridge

Atlantic Boulevard Bridge

26th Street Bridge

Storm Water Systems

A few local drainage problems occur in the City of Vernon. There is a Drainage Master Plan, and City of Vernon Public Works Division staff is aware of local drainage threats. The problems are often present where storm water runoff enters culverts or goes underground into storm sewers. Inadequate maintenance can also contribute to the flood hazard in urban areas.

Water/Wastewater Treatment Facilities

The City of Vernon maintains and operates a network of sewer mains that connect into the Sanitation District of Los Angeles County System. There are 3 sanitary districts in the City of Vernon, and no sewage treatment facilities. The City of Vernon along with Maywood Mutual and California Water Service provide water to the City's businesses and residents.

Water Quality

Environmental quality problems include bacteria, toxins, and pollution.

Flood Endnotes

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1. <http://www.lalc.k12.ca.us/target/units/river/tour/hist.html>
 2. Gumprecht, Blake, 1999, Johns Hopkins University Press, Baltimore, MD.
 3. Ibid
 4. http://www.usc.edu/isd/archives/la/scandals/st_francis_dam.html
 5. <http://www.latimes.com/news/local/surroundings/la-me-surround11dec11,0,1754871.story?coll=la-adelphia-right-rail>
 6. <http://www.fema.gov/rrr/talkdiz/landslide.shtm#what>

Section 7: Windstorm Hazards in the City of Vernon

Why are Severe Windstorms a Threat to the City of Vernon?

Severe wind storms pose a significant risk to life and property in the region by creating conditions that disrupt essential systems such as public utilities, telecommunications, and transportation routes. High winds can and do occasionally cause tornado-like damage to local homes and businesses. Severe windstorms can present a very destabilizing effect on the dry brush that covers local hillsides and urban wildland interface areas. High winds can have destructive impacts, especially to trees, power lines, and utility services.

Figure 7-1: Santa Ana Winds (Source: NASA's "Observatorium")



Santa Ana Winds and Tornado-Like Wind Activity

Based on local history, most incidents of high wind in the City of Vernon are the result of the Santa Ana wind conditions. While high impact wind incidents are not frequent in the area, significant Santa Ana Wind events and sporadic tornado activity have been known to negatively impact the local community.

What are Santa Ana Winds?

"Santa Ana winds are generally defined as warm, dry winds that blow from the east or northeast (offshore). These winds occur below the passes and canyons of the coastal ranges of Southern California and in the Los Angeles basin. Santa Ana winds often blow with exceptional speed in the Santa Ana Canyon (the canyon from which it derives its name). Forecasters at the National Weather Service offices in Oxnard and San Diego usually place speed minimums on these winds and reserve the use of "Santa Ana" for winds greater than 25 knots."¹ These winds accelerate to speeds of 35 knots as they move through canyons and passes, with gusts to 50 or even 60 knots.

"The complex topography of Southern California combined with various atmospheric conditions create numerous scenarios that may cause widespread or isolated Santa Ana events. Commonly, Santa Ana winds develop when a region of high pressure builds over

the Great Basin (the high plateau east of the Sierra Mountains and west of the Rocky Mountains including most of Nevada and Utah). Clockwise circulation around the center of this high pressure area forces air downslope from the high plateau. The air warms as it descends toward the California coast at the rate of 5 degrees F per 1000 feet due to compressional heating. Thus, compressional heating provides the primary source of warming. The air is dry since it originated in the desert, and it dries out even more as it is heated.”²

These regional winds typically occur from October to March, and, according to most accounts are named either for the Santa Ana River Valley where they originate or for the Santa Ana Canyon, southeast of Los Angeles, where they pick up speed.

What are Tornadoes?

Tornadoes are spawned when there is warm, moist air near the ground, cool air aloft, and winds that speed up and change direction. An obstruction, such as a house, in the path of the wind causes it to change direction. This change increases pressure on parts of the house, and the combination of increased pressures and fluctuating wind speeds creates stresses that frequently cause structural failures.

In order to measure the intensity and wind strength of a tornado, Dr. T. Theodore Fujita developed the Fujita Tornado Damage Scale. This scale compares the estimated wind velocity with the corresponding amount of suspected damage. The scale measures six classifications of tornadoes with increasing magnitude from an “F0” tornado to a “F6+” tornado.

Table 7-1: Fujita Tornado Damage Scale

Scale	Wind Estimate (mph)	Typical Damage
F0	< 73	Light damage. Some damage to chimneys and TV antennas; breaks twigs off trees; pushes over shallow-rooted trees.
F1	73-112	Moderate damage. Peels surface off roofs; windows broken; light trailer houses pushed or overturned; some trees uprooted or snapped; moving automobiles pushed off the road. 74 mph is the beginning of hurricane wind speed.
F2	113-157	Considerable damage. Roofs torn off frame houses leaving strong upright walls; weak buildings in rural areas demolished; trailer houses destroyed; large trees snapped or uprooted; railroad boxcars pushed over; light object missiles generated; cars blown off highway.
F3	158-206	Severe damage. Roofs and some walls torn off frame houses; some rural buildings completely demolished; trains overturned; steel-framed hangar-warehouse-type structures torn; cars lifted off the ground; most trees in a forest uprooted snapped, or leveled.
F4	207-260	Devastating damage. Whole frame houses leveled, leaving piles of debris; steel structures badly damaged; trees debarked by small flying debris; cars and trains thrown some distances or rolled considerable distances; large missiles generated.

F5	261-318	Incredible damage. Whole frame houses tossed off foundations; steel-reinforced concrete structures badly damaged; automobile-sized missiles generated; trees debarked; incredible phenomena can occur.
F6-F12	319 to sonic	Inconceivable damage. Should a tornado with the maximum wind speed in excess of F5 occur, the extent and types of damage may not be conceived. A number of missiles such as iceboxes, water heaters, storage tanks, automobiles, etc. will create serious secondary damage on structures.
Source: http://weather.latimes.com/tornadoFAQ.asp		

Microbursts

Unlike tornados, microbursts, are strong, damaging winds which strike the ground and often give the impression a tornado has struck. They frequently occur during intense thunderstorms. The origin of a microburst is downward moving air from a thunderstorm's core. But unlike a tornado, they affect only a rather small area.

University of Chicago storm researcher Dr Ted Fujita first coined the term “downburst” to describe strong, downdraft winds flowing out of a thunderstorm cell that he believed were responsible for the crash of Eastern Airlines Flight 66 in June of 1975.³

A downburst is a straight-direction surface wind in excess of 39 mph caused by a small-scale, strong downdraft from the base of convective thundershowers and thunderstorms. In later investigations into the phenomena he defined two sub-categories of downbursts: the larger macrobursts and small microbursts.⁴

Macrobursts are downbursts with winds up to 117 mph which spread across a path greater than 2.5 miles wide at the surface and which last from 5 to 30 minutes. The microburst, on the other hand is confined to an even smaller area, less than 2.5 miles in diameter from the initial point of downdraft impact. An intense microburst can result in damaging winds near 270 km/hr (170 mph) and often last for less than five minutes.⁵

“Downbursts of all sizes descend from the upper regions of severe thunderstorms when the air accelerates downward through either exceptionally strong evaporative cooling or by very heavy rain which drags dry air down with it. When the rapidly descending air strikes the ground, it spreads outward in all directions, like a fast-running faucet stream hitting the sink bottom.

When the microburst wind hits an object on the ground such as a house, garage or tree, it can flatten the buildings and strip limbs and branches from the tree. After striking the ground, the powerful outward running gust can wreak further havoc along its path. Damage associated with a microburst is often mistaken for the work of a tornado, particularly directly under the microburst. However, damage patterns away from the impact area are characteristic of straight-line winds rather than the twisted pattern of tornado damage.”⁶

Tornados, like those that occur every year in the Midwest and Southeast parts of the United States, are a rare phenomenon in most of California, with most tornado-like activity coming from micro-bursts.

Local History of Windstorm Events

While the effects of Santa Ana Winds are often overlooked, it should be noted that in 2003, two deaths in Southern California were directly related to the fierce condition. A falling tree struck one woman in San Diego.⁷ The second death occurred when a passenger in a vehicle was hit by a flying pickup truck cover launched by the Santa Ana Winds.⁸

Table 7-2: Santa Ana Wind Events during 2003

The following Santa Ana wind events were featured in news resources during 2003:	
January 6, 2003 OC Register	"One of the strongest Santa Ana windstorms in a decade toppled 26 power poles in Orange early today, blew over a mobile derrick in Placentia, crushing two vehicles, and delayed Metrolink rail service." This windstorm also knocked out power to thousands of people in northeastern Orange County.
January 8, 2003 CBSNEWS.com	"Santa Ana's roared into Southern California late Sunday, blowing over trees, trucks and power poles. Thousands of people lost power."
March 16, 2003 dailybulletin.com	Fire Officials Brace for Santa Ana Winds - - "The forest is now so dry and so many trees have died that fires, during relatively calm conditions, are running as fast and as far as they might during Santa Ana Winds. Now the Santa Ana season is here. Combine the literally tinder dry conditions with humidity in the single digits and 60-80 mph winds, and fire officials shudder."

Table 7-3: Major Windstorms in the vicinity of the City of Vernon

<i>Date</i>	<i>Location and Damage</i>
<i>November 5-6, 1961</i>	<i>Santa Ana winds. Fire in Topanga Canyon</i>
<i>February 10-11, 1973</i>	<i>Strong storm winds: 57 mph at Riverside, 46 Newport Beach. Some 200 trees uprooted in Pacific Beach alone</i>
<i>October 26-27, 1993</i>	<i>Santa Ana winds. Fire in Laguna Hills</i>
<i>October 14, 1997</i>	<i>Santa Ana winds: gusts 87 mph in central Orange County. Large fire in Orange County</i>
<i>December 29, 1997</i>	<i>Gusts 60+ mph at Santa Ana</i>

<i>March 28-29, 1998</i>	<i>Strong storm winds in Orange County: sustained 30-40 mph. Gust 70 mph at Newport Beach, gust 60 Huntington Beach. Trees down, power out, and damage across Orange and San Diego Counties. 1 illegal immigrant dead in Jamul.</i>
<i>September 2, 1998</i>	<i>Strong winds from thunderstorms in Orange County with gusts to 40mph. Large fires in Orange County</i>
<i>December 6, 1998</i>	<i>Thunderstorm in Los Alamitos and Garden Grove: gust 50-60 mph called "almost a tornado"</i>
<i>December 21-22, 1999</i>	<i>Santa Ana winds: gust 68 mph at Campo, 53 Huntington Beach, 44 Orange. House and tree damage in Hemet.</i>
<i>March 5-6, 2000</i>	<i>Strong thunderstorm winds at the coast: gust 60 mph at Huntington Beach Property damage and trees downed along the coast</i>
<i>April 1, 2000</i>	<i>Santa Ana winds: gust 93 mph at Mission Viejo, 67 Anaheim Hills</i>
<i>December 25-26, 2000</i>	<i>Santa Ana winds: gust 87 mph at Fremont Canyon. Damage and injuries in Mira Loma, Orange and Riverside Counties</i>
<i>February 13, 2001</i>	<i>Thunderstorm gust to 89 mph in east Orange</i>
Source: http://www.wrh.noaa.gov/sandiego/research/Guide/weatherhistory.pdf	

The following is a glimpse of major tornado-like events to hit the vicinity of the City of Vernon:

Table 7-4: Major Tornado-like Events in Orange County

<i>Major Tornado-like Events in the Orange County Area 1958-2001</i>	
Date	Location and Damage
<i>April 1, 1958</i>	<i>Tornado: Laguna Beach</i>
<i>February 19, 1962</i>	<i>Tornado: Irvine</i>
<i>April 8, 1965</i>	<i>Tornado: Costa Mesa</i>
<i>November 7, 1966</i>	<i>Newport Beach and Costa Mesa: Property Damage</i>
<i>March 16, 1977</i>	<i>Tornado skipped from Fullerton to Brea Damage to 80 homes and injured four people</i>
<i>February 9, 1978</i>	<i>Tornado: Irvine. Property damage and 6 injured</i>
<i>January 31, 1979</i>	<i>Tornado Santa Ana Numerous power outages</i>
<i>November 9, 1982</i>	<i>Tornadoes in Garden Grove and Mission Viejo. Property damage</i>
<i>January 13, 1984</i>	<i>Tornado: Huntington Beach. Property damage</i>
<i>March 16, 1986</i>	<i>Tornado: Anaheim. Property damage</i>
<i>February 22-24, 1987</i>	<i>Tornadoes and waterspouts: Huntington Beach</i>
<i>January 18, 1988</i>	<i>Tornadoes: Mission Viejo and San Clemente. Property damage</i>

<i>February 28, 1991</i>	<i>Tornado: Tustin</i>
<i>March 27, 1991</i>	<i>Tornado: Huntington Beach</i>
<i>December 7, 1992</i>	<i>Tornadoes: Anaheim and Westminster Property damage</i>
<i>January 18, 1993</i>	<i>Tornado: Orange County Property damage</i>
<i>February 8, 1993</i>	<i>Tornado: Brea. Property damage</i>
<i>February 7, 1994</i>	<i>Tornado from Newport Beach to Tustin. Roof and window damage. Trees were also knocked down</i>
<i>December 13, 1994</i>	<i>Two waterspouts about 0.5 mile off Newport Beach</i>
<i>December 13, 1995</i>	<i>Funnel cloud near Fullerton Airport</i>
<i>March 13, 1996</i>	<i>Funnel cloud in Irvine</i>
<i>November 10-11, 1997</i>	<i>Waterspout came ashore at Newport Pier on the 10th and dissipated over western Costa Mesa. Tornadoes in Irvine on the 11th and a funnel cloud developed. 10th: Winds estimated at 60-70 mph. 11th: Minor power outages occurred with little property damage. A fisherman was blown from one end of Newport Pier to the other. Property and vehicle damage in Irvine from flying debris. Ten cars were thrown a few feet.</i>
<i>December 21, 1997</i>	<i>Waterspout and tornado in Huntington Beach. Damage to boats, houses, and city property</i>
<i>February 24, 1998</i>	<i>Tornado in Huntington Beach. Property damage with a power outage, roof flew ¼ mile</i>
<i>March 13-14, 1998</i>	<i>Numerous waterspouts between Long Beach, Huntington Beach, and Catalina</i>
<i>March 31-April 1, 1998</i>	<i>Numerous funnel clouds reported off Orange County coastline, two of which became waterspouts off Orange County. One waterspout briefly hit the coast off the Huntington Beach pier.</i>
<i>June 6, 1998</i>	<i>Two funnel clouds off Dana Point</i>
<i>December 31, 1998</i>	<i>Funnel clouds in Santa Ana. Waterspout off Costa Mesa coast</i>
<i>February 21, 2000</i>	<i>Tornado: Anaheim Hills. Property damage</i>
<i>October 28, 2000</i>	<i>Funnel clouds around Newport Beach and Costa Mesa</i>
<i>January 10, 2001</i>	<i>Funnel cloud at Orange County airport and Newport Beach</i>
<i>February 24, 2001</i>	<i>Tornado in Orange. Damage to warehouse, 6 structures, fences, and telephone wires.</i>
<i>Source: http://www.wrh.noaa.gov/sandiego/research/Guide/weatherhistory.pdf</i>	

Windstorm Hazard Assessment

Hazard Identification

A windstorm event in the region can range from short term microburst activity lasting only minutes to a long duration Santa Ana wind condition that can last for several days as in the case of the January 2003 Santa Ana wind event. Windstorms in the City of Vernon

can cause extensive damage including heavy tree stands, road and highway infrastructure, and critical utility facilities.

Figure 7-1 shows the direction of the Santa Ana winds as they travel from the stable, high-pressure weather system called the Great Basin High through the canyons and towards the low-pressure system off the Pacific. Clearly the area of the City of Vernon is in the direct path of the ocean-bound Santa Ana winds.

Vulnerability and Risk

With an analysis of the high wind and tornado events depicted in the “Local History” section, we can deduce the common windstorm impact areas including impacts on life, property, utilities, infrastructure and transportation. Additionally, if a windstorm disrupts power to local residential communities, the American Red Cross and City resources might be called upon for care and shelter duties. Displacing residents and utilizing City resources for shelter staffing and disaster cleanup can cause an economic hardship on the community.

Community Windstorm Issues

What is Susceptible to Windstorms?

Life and Property

Based on the history of the region, windstorm events can be expected, perhaps annually, across widespread areas of the region which can be adversely impacted during a windstorm event. This can result in the involvement of City of Vernon emergency response personnel during a wide-ranging windstorm or microburst tornadic activity. Both residential and commercial structures with weak reinforcement are susceptible to damage. Wind pressure can create a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing currents can create lift suction forces that pull building components and surfaces outward. With extreme wind forces, the roof or entire building can fail causing considerable damage. Such damage to property occurred on February 24, 1998 when a portion of a roof on an industrial building in City of Vernon was launched down the street by severe winds.

Debris carried along by extreme winds can directly contribute to loss of life and indirectly to the failure of protective building envelopes, siding, or walls. When severe windstorms strike a community, downed trees, power lines, and damaged property can be major hindrances to emergency response and disaster recovery.

The Beaufort Scale below, coined and developed by Sir Francis Beaufort in 1805, illustrates the effect that varying wind speed can have on sea swells and structures:

Table 7-5: Beaufort Scale

BEAUFORT SCALE		
Beaufort Force	Speed (mph)	Wind Description - State of Sea - Effects on Land
0	Less 1	Calm - Mirror-like - Smoke rises vertically
1	1-3	Light - Air Ripples look like scales; No crests of foam - Smoke drift shows direction of wind, but wind vanes do not
2	4-7	Light Breeze - Small but pronounced wavelets; Crests do not break - Wind vanes move; Leaves rustle; You can feel wind on the face
3	8-12	Gentle Breeze - Large Wavelets; Crests break; Glassy foam; A few whitecaps - Leaves and small twigs move constantly; Small, light flags are extended
4	13-18	Moderate Breeze - Longer waves; Whitecaps - Wind lifts dust and loose paper; Small branches move
5	19-24	Fresh Breeze - Moderate, long waves; Many whitecaps; Some spray - Small trees with leaves begin to move
6	25-31	Strong Breeze - Some large waves; Crests of white foam; Spray - Large branches move; Telegraph wires whistle; Hard to hold umbrellas
7	32-38	Near Gale - White foam from breaking waves blows in streaks with the wind - Whole trees move; Resistance felt walking into wind
8	39-46	Gale - Waves high and moderately long; Crests break into spin drift, blowing foam in well marked streaks - Twigs and small branches break off trees; Difficult to walk
9	47-54	Strong Gale - High waves with wave crests that tumble; Dense streaks of foam in wind; Poor visibility from spray - Slight structural damage
10	55-63	Storm - Very high waves with long, curling crests; Sea surface appears white from blowing foam; Heavy tumbling of sea; Poor visibility - Trees broken or uprooted; Considerable structural damage
11	64-73	Violent Storm - Waves high enough to hide small and medium sized ships; Sea covered with patches of white foam; Edges of wave crests blown into froth; Poor visibility - Seldom experienced inland; Considerable structural damage
12	>74	Hurricane - Sea white with spray. Foam and spray render visibility almost non-existent - Widespread damage. Very rarely experienced on land.
Source: http://www.compuweather.com/decoder-charts.html		

Disruption of Critical Services

Critical facilities include police stations, fire stations, hospitals, shelters, and other facilities that provide important services to the community. These facilities and their services need to be functional after an earthquake event.

Utilities

Historically, falling trees have been the major cause of power outages in the region. Windstorms such as strong microbursts and Santa Ana Wind conditions can cause flying debris and downed utility lines. For example, tree limbs breaking in winds of only 45 mph can be thrown over 75 feet. As such, overhead power lines can be damaged even in relatively minor windstorm events. Falling trees can bring electric power lines down to the pavement, creating the possibility of lethal electric shock. Rising population growth and new infrastructure in the region creates a higher probability for damage to occur from windstorms as more life and property are exposed to risk.

Infrastructure

Windstorms can damage buildings, power lines, and other property and infrastructure due to falling trees and branches. During wet winters, saturated soils cause trees to become less stable and more vulnerable to uprooting from high winds.

Windstorms can result in collapsed or damaged buildings or blocked roads and bridges, damaged traffic signals, streetlights, and parks, among others. Roads blocked by fallen trees during a windstorm may have severe consequences to people who need access to emergency services. Emergency response operations can be complicated when roads are blocked or when power supplies are interrupted. Industry and commerce can suffer losses from interruptions in electric services and from extended road closures. They can also sustain direct losses to buildings, personnel, and other vital equipment. There are direct consequences to the local economy resulting from windstorms related to both physical damages and interrupted services.

Increased Fire Threat

Perhaps the greatest danger from windstorm activity in Southern California comes from the combination of the Santa Ana winds with the major fires that occur every few years in the urban/wildland interface. With the Santa Ana winds driving the flames, the speed and reach of the flames is even greater than in times of calm wind conditions. The higher fire hazard raised by a Santa Ana wind condition requires that even more care and attention be paid to proper brush clearances on property in the wildland/urban interface areas.

Transportation

Windstorm activity can have an impact on local transportation in addition to the problems caused by downed trees and electrical wires blocking streets and highways. During periods of extremely strong Santa Ana winds, major highways can be temporarily closed to truck and recreational vehicle traffic. However, typically these disruptions are not long lasting, nor do they carry a severe long term economic impact on the region.

End Notes:

1<http://nimbo.wrh.noaa.gov/Sandiego/snawind.html>

2Ibid

3Keith C. Heidorn at <http://www.suite101.com/article.cfm/13646/100918>, June 1, 2003

4Ibid

5Ibid

6Ibid

7www.cbsnews.com, January 8, 2003

8www.cbsnews.com/stories/2003/01/06/national/

Special Thanks to Jacob Green, Assistant to the Emergency Services Coordinator, City of Fountain Valley/Huntington Beach Hazard Mitigation Planning Committee

Appendix A: Master Resource Directory

The Resource Directory provides contact information for local, regional, state, and federal programs that are currently involved in hazard mitigation activities. The EOC Direction & Control Group may look to the organizations on the following pages for resources and technical assistance. The Resource Directory provides a foundation for potential partners in action item implementation.

The EOC Direction & Control Group will continue to add contact information for organizations currently engaged in hazard mitigation activities. This section may also be used by various community members interested in hazard mitigation information and projects.

American Public Works Association			
Level: National	Hazard: Multi	http://www.apwa.net	
2345 Grand Boulevard		Suite 500	
Kansas City, MO 64108-2641		Ph: 816-472-6100	Fx: 816-472-1610
Notes: The American Public Works Association is an international educational and professional association of public agencies, private sector companies, and individuals dedicated to providing high quality public works goods and services.			
Association of State Floodplain Managers			
Level: Federal	Hazard: Flood	www.floods.org	
2809 Fish Hatchery Road			
Madison, WI 53713		Ph: 608-274-0123	Fx:
Notes: The Association of State Floodplain Managers is an organization of professionals involved in floodplain management, flood hazard mitigation, the National Flood Insurance Program, and flood preparedness, warning and recovery			
Building Seismic Safety Council (BSSC)			
Level: National	Hazard: Earthquake	www.bssconline.org	
1090 Vermont Ave., NW		Suite 700	
Washington, DC 20005		Ph: 202-289-7800	Fx: 202-289-109
Notes: The Building Seismic Safety Council (BSSC) develops and promotes building earthquake risk mitigation regulatory provisions for the nation.			

California Department of Transportation (CalTrans)			
Level: State	Hazard: Multi	http://www.dot.ca.gov/	
120 S. Spring Street			
Los Angeles, CA 90012	Ph: 213-897-3656	Fx:	
Notes: CalTrans is responsible for the design, construction, maintenance, and operation of the California State Highway System, as well as that portion of the Interstate Highway System within the state's boundaries. Alone and in partnership with Amtrak, Caltrans is also involved in the support of intercity passenger rail service in California.			
California Resources Agency			
Level: State	Hazard: Multi	http://resources.ca.gov/	
1416 Ninth Street		Suite 1311	
Sacramento, CA 95814	Ph: 916-653-5656	Fx:	
Notes: The California Resources Agency restores, protects and manages the state's natural, historical and cultural resources for current and future generations using solutions based on science, collaboration and respect for all the communities and interests involved.			
California Division of Forestry (CDF)			
Level: State	Hazard: Multi	http://www.fire.ca.gov/php/index.php	
210 W. San Jacinto			
Perris CA 92570	Ph: 909-940-6900	Fx:	
Notes: The California Department of Forestry and Fire Protection protects over 31 million acres of California's privately-owned wildlands. CDF emphasizes the management and protection of California's natural resources.			
California Division of Mines and Geology (DMG)			
Level: State	Hazard: Multi	www.consrv.ca.gov/cgs/index.htm	
801 K Street		MS 12-30	
Sacramento, CA 95814	Ph: 916-445-1825	Fx: 916-445-5718	
Notes: The California Geological Survey develops and disseminates technical information and advice on California's geology, geologic hazards, and mineral resources.			
California Environmental Resources Evaluation System (CERES)			
Level: State	Hazard: Multi	http://ceres.ca.gov/	
900 N St.		Suite 250	
Sacramento, Ca. 95814	Ph: 916-653-2238	Fx:	
Notes: CERES is an excellent website for access to environmental information and websites.			

California Department of Water Resources (DWR)			
Level: State	Hazard: Flood	http://www.dwr.water.ca.gov	
1416 9th Street			
Sacramento, CA 95814		Ph: 916-653-6192	Fx:
Notes: The Department of Water Resources manages the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments.			
California Department of Conservation: Southern California Regional Office			
Level: State	Hazard: Multi	www.consrv.ca.gov	
655 S. Hope Street		#700	
Los Angeles, CA 90017-2321		Ph: 213-239-0878	Fx: 213-239-0984
Notes: The Department of Conservation provides services and information that promote environmental health, economic vitality, informed land-use decisions and sound management of our state's natural resources.			
California Planning Information Network			
Level: State	Hazard: Multi	www.calpin.ca.gov	
		Ph:	Fx:
Notes: The Governor's Office of Planning and Research (OPR) publishes basic information on local planning agencies, known as the California Planners' Book of Lists. This local planning information is available on-line with new search capabilities and up-to-the- minute updates.			
EPA, Region 9			
Level: Regional	Hazard: Multi	http://www.epa.gov/region09	
75 Hawthorne Street			
San Francisco, CA 94105		Ph: 415-947-8000	Fx: 415-947-3553
Notes: The mission of the U.S. Environmental Protection Agency is to protect human health and to safeguard the natural environment through the themes of air and global climate change, water, land, communities and ecosystems, and compliance and environmental stewardship.			

Federal Emergency Management Agency, Region IX			
Level: Federal	Hazard: Multi	www.fema.gov	
1111 Broadway		Suite 1200	
Oakland, CA 94607		Ph: 510-627-7100	Fx: 510-627-7112
Notes: The Federal Emergency Management Agency is tasked with responding to, planning for, recovering from and mitigating against disasters.			
Federal Emergency Management Agency, Mitigation Division			
Level: Federal	Hazard: Multi	www.fema.gov/fima/planhowto.shtm	
500 C Street, S.W.			
Washington, D.C. 20472		Ph: 202-566-1600	Fx:
Notes: The Mitigation Division manages the National Flood Insurance Program and oversees FEMA's mitigation programs. It has of a number of programs and activities of which provide citizens Protection, with flood insurance; Prevention, with mitigation measures and Partnerships, with communities throughout the country.			
Floodplain Management Association			
Level: Federal	Hazard: Flood	www.floodplain.org	
P.O. Box 50891			
Sparks, NV 89435-0891		Ph: 775-626-6389	Fx: 775-626-6389
Notes: The Floodplain Management Association is a nonprofit educational association. It was established in 1990 to promote the reduction of flood losses and to encourage the protection and enhancement of natural floodplain values. Members include representatives of federal, state and local government agencies as well as private firms.			
Gateway Cities Partnership			
Level: Regional	Hazard: Multi	www.gatewaycities.org	
7300 Alondra Boulevard		Suite 202	
Paramount, CA 90723		Ph: 562-817-0820	Fx:
Notes: Gateway Cities Partnership is a 501 C 3 non-profit Community Development Corporation for the Gateway Cities region of southeast LA County. The region comprises 27 cities that roughly speaking extends from Montebello on the north to Long Beach on the South, the Alameda Corridor on the west to the Orange County line on the east.			

Governor's Office of Emergency Services (OES)			
Level: State	Hazard: Multi	www.oes.ca.gov	
P.O. Box 419047			
Rancho Cordova, CA 95741-9047		Ph: 916 845- 8911	Fx: 916 845- 8910
Notes: The Governor's Office of Emergency Services coordinates overall state agency response to major disasters in support of local government. The office is responsible for assuring the state's readiness to respond to and recover from natural, manmade, and war-caused emergencies, and for assisting local governments in their emergency preparedness, response and recovery efforts.			
Greater Antelope Valley Economic Alliance			
Level: Regional	Hazard: Multi		
42060 N. Tenth Street West			
Lancaster, CA 93534		Ph: 661-945-2741	Fx: 661-945-7711
Notes: The Greater Antelope Valley Economic Alliance, (GA VEA) is a 501 (c)(6) nonprofit organization with a 501(c)(3) affiliated organization the Antelope Valley Economic Research and Education Foundation. GA VEA is a public-private partnership of business, local governments, education, non-profit organizations and health care organizations that was founded in 1999 with the goal of attracting good paying jobs to the Antelope Valley in order to build a sustainable economy.			
Landslide Hazards Program, USGS			
Level: Federal	Hazard: Landslide	http://landslides.usgs.gov/index.html	
12201 Sunrise Valley Drive		MS 906	
Reston, VA 20192		Ph: 703-648- 4000	Fx:
Notes: The NLIC website provides good information on the programs and resources regarding landslides. The page includes information on the National Landslide Hazards Program Information Center, a bibliography, publications, and current projects. USGS scientists are working to reduce long-term losses and casualties from landslide hazards through better understanding of the causes and mechanisms of ground failure both nationally and worldwide.			

Los Angeles County Economic Development Corporation			
Level: Regional	Hazard: Multi	www.laedc.org	
444 S. Flower Street		34th Floor	
Los Angeles, CA 90071		Ph: 213-236-4813	Fx: 213- 623-0281
Notes: The LAEDC is a private, non-profit 501 (c) 3 organization established in 1981 with the mission to attract, retain and grow businesses and jobs in the Los Angeles region. The LAEDC is widely relied upon for its Southern California Economic Forecasts and Industry Trend Reports. Lead by the renowned Jack Kyser (Sr. Vice President, Chief Economist) his team of researchers produces numerous publications to help business, media and government navigate the LA region's diverse economy.			
Los Angeles County Public Works Department			
Level: County	Hazard: Multi	http://ladpw.org	
900 S. Fremont Ave.			
Alhambra, CA 91803		Ph: 626-458-5100	Fx:
Notes: The Los Angeles County Department of Public Works protects property and promotes public safety through Flood Control, Water Conservation, Road Maintenance, Bridges, Buses and Bicycle Trails, Building and Safety, Land Development, Waterworks, Sewers, Engineering, Capital Projects and Airports			
National Wildland/Urban Interface Fire Program			
Level: Federal	Hazard: Wildfire	www.firewise.org/	
1 Batterymarch Park			
Quincy, MA 02169-7471		Ph: 617-770-3000	Fx: 617 770-0700
Notes: FIREWISE maintains a Website designed for people who live in wildfire- prone areas, but it also can be of use to local planners and decision makers. The site offers online wildfire protection information and checklists, as well as listings of other publications, videos, and conferences.			
National Resources Conservation Service			
Level: Federal	Hazard: Multi	http://www.nrcs.usda.gov/	
14th and Independence Ave., SW		Room 5105-A	
Washington, DC 20250		Ph: 202-720-7246	Fx: 202-720-7690
Notes: NRCS assists owners of America's private land with conserving their soil, water, and other natural resources, by delivering technical assistance based on sound science and suited to a customer's specific needs. Cost shares and financial incentives are available in some cases.			

National Interagency Fire Center (NIFC)			
Level: Federal	Hazard: Wildfire	www.nifc.gov	
3833 S. Development Ave.			
Boise, Idaho 83705-5354		Ph: 208-387- 5512	Fx:
Notes: The NIFC in Boise, Idaho is the nation's support center for wildland firefighting. Seven federal agencies work together to coordinate and support wildland fire and disaster operations.			
National Fire Protection Association (NFPA)			
Level: National	Hazard: Wildfire	http://www.nfpa.org/catalog/home/index.asp	
1 Batterymarch Park			
Quincy, MA 02169-7471		Ph: 617-770-3000	Fx: 617 770-0700
Notes: The mission of the international nonprofit NFPA is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating scientifically-based consensus codes and standards, research, training and education			
National Floodplain Insurance Program (NFIP)			
Level: Federal	Hazard: Flood	www.fema.gov/nfip/	
500 C Street, S.W.			
Washington, D.C. 20472		Ph: 202-566-1600	Fx:
Notes: The Mitigation Division manages the National Flood Insurance Program and oversees FEMA's mitigation programs. It has of a number of programs and activities providing citizens Protection, with flood insurance; Prevention, with mitigation measures and Partnerships, with communities throughout the country.			
National Oceanic /Atmospheric Administration			
Level: Federal	Hazard: Multi	www.noaa.gov	
14th Street & Constitution Ave NW		Rm 6013	
Washington, DC 20230		Ph: 202-482-6090	Fx: 202-482-3154
Notes: NOAA's historical role has been to predict environmental changes, protect life and property, provide decision makers with reliable scientific information, and foster global environmental stewardship.			

National Weather Service, Office of Hydrologic Development		
Level: Federal	Hazard: Flood	http://www.nws.noaa.gov/
1325 East West Highway	SSMC2	
Silver Spring, MD 20910	Ph: 301-713-1658	Fx: 301-713-0963
Notes: The Office of Hydrologic Development (OHD) enhances National Weather Service (NWS) products by: infusing new hydrologic science, developing hydrologic techniques for operational use, managing hydrologic development by NWS field office, providing advanced hydrologic products to meet needs identified by NWS customers		
National Weather Service		
Level: Federal	Hazard: Multi	http://www.nws.noaa.gov/
520 North Elevar Street		
Oxnard, CA 93030	Ph: 805-988- 6615	Fx:
Notes: The National Weather Service is responsible for providing weather service to the nation. It is charged with the responsibility of observing and reporting the weather and with issuing forecasts and warnings of weather and floods in the interest of national safety and economy. Briefly, the priorities for service to the nation are: 1. protection of life, 2. protection of property, and 3. promotion of the nation's welfare and economy.		
San Gabriel Valley Economic Partnership		
Level: Regional	Hazard: Multi	www.valleynet.org
4900 Rivergrade Road	Suite A310	
Irwindale, CA 91706	Ph: 626-856-3400	Fx: 626-856-5115
Notes: The San Gabriel Valley Economic Partnership is a non-profit corporation representing both public and private sectors. The Partnership is the exclusive source for San Gabriel Valley-specific information, expertise, consulting, products, services, and events. It is the single organization in the Valley with the mission to sustain and build the regional economy for the mutual benefit of all thirty cities, chambers of commerce, academic institutions, businesses and residents.		
Sanitation Districts of Los Angeles County		
Level: County	Hazard: Flood	http://www.lacsd.org/
1955 Workman Mill Road		
Whittier, CA 90607	Ph:562-699-7411 x2301	Fx:
Notes: The Sanitation Districts provide wastewater and solid waste management for over half the population of Los Angeles County and turn waste products into resources such as reclaimed water, energy, and recyclable materials.		

Santa Monica Mountains Conservancy			
Level: Regional	Hazard: Multi	http://smmc.ca.gov/	
570 West Avenue Twenty-Six		Suite 100	
Los Angeles, CA 90065		Ph: 323-221-8900	Fx:
Notes: The Santa Monica Mountains Conservancy helps to preserve over 55,000 acres of parkland in both wilderness and urban settings, and has improved more than 114 public recreational facilities throughout Southern California.			
South Bay Economic Development Partnership			
Level: Regional	Hazard: Multi	www.southbaypartnership.com	
3858 Carson Street		Suite 110	
Torrance, CA 90503		Ph: 310-792-0323	Fx: 310-543-9886
Notes: The South Bay Economic Development Partnership is a collaboration of business, labor, education and government. Its primary goal is to plan and implement an economic development and marketing strategy designed to retain and create jobs and stimulate economic growth in the South Bay of Los Angeles County.			
South Coast Air Quality Management District (AQMD)			
Level: Regional	Hazard: Multi	www.aqmd.gov	
21865 E. Copley Drive			
Diamond Bar, CA 91765		Ph: 800-CUT-SMOG	Fx:
Notes: AQMD is a regional government agency that seeks to achieve and maintain healthful air quality through a comprehensive program of research, regulations, enforcement, and communication. The AQMD covers Los Angeles and Orange Counties and parts of Riverside and San Bernardino Counties.			
Southern California Earthquake Center (SCEC)			
Level: Regional	Hazard: Earthquake	www.scec.org	
3651 Trousdale Parkway		Suite 169	
Los Angeles, CA 90089-0742		Ph: 213-740-5843	Fx: 213/740-0011
Notes: The Southern California Earthquake Center (SCEC) gathers new information about earthquakes in Southern California, integrates this information into a comprehensive and predictive understanding of earthquake phenomena, and communicates this understanding to end-users and the general public in order to increase earthquake awareness, reduce economic losses, and save lives.			

Southern California Association of Governments (SCAG)			
Level: Regional	Hazard: Multi	www.scag.ca.gov	
818 W. Seventh Street		12th Floor	
Los Angeles, CA 90017		Ph: 213-236-1800	Fx: 213-236-1825
Notes: The Southern California Association of Governments functions as the Metropolitan Planning Organization for six counties: Los Angeles, Orange, San Bernardino, Riverside, Ventura and Imperial. As the designated Metropolitan Planning Organization, the Association of Governments is mandated by the federal government to research and draw up plans for transportation, growth management, hazardous waste management, and air quality.			
State Fire Marshal (SFM)			
Level: State	Hazard: Wildfire	http://osfm.fire.ca.gov	
1131 "S" Street			
Sacramento, CA 95814		Ph: 916-445-8200	Fx: 916-445-8509
Notes: The Office of the State Fire Marshal (SFM) supports the mission of the California Department of Forestry and Fire Protection (CDF) by focusing on fire prevention. SFM regulates buildings in which people live, controls substances which may, cause injuries, death and destruction by fire; provides statewide direction for fire prevention within wildland areas; regulates hazardous liquid pipelines; reviews regulations and building standards; and trains and educates in fire protection methods and responsibilities.			
The Community Rating System (CRS)			
Level: Federal	Hazard: Flood	http://www.fema.gov/nfip/crs.shtm	
500 C Street, S.W.			
Washington, D.C. 20472		Ph: 202-566-1600	Fx:
Notes: The Community Rating System (CRS) recognizes community floodplain management efforts that go beyond the minimum requirements of the NFIP. Property owners within the County would receive reduced NFIP flood insurance premiums if the County implements floodplain management practices that qualify it for a CRS rating. For further information on the CRS, visit FEMA's website.			
United States Geological Survey			
Level: Federal	Hazard: Multi	http://www.usgs.gov/	
345 Middlefield Road			
Menlo Park, CA 94025		Ph: 650-853-8300	Fx:
Notes: The USGS provides reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.			

U.S. Army Corps of Engineers			
Level: Federal	Hazard: Multi	http://www.usace.army.mil	
P.O. Box 532711			
Los Angeles CA 90053- 2325		Ph: 213-452- 3921	Fx:
Notes: The United States Army Corps of Engineers work in engineering and environmental matters. A workforce of biologists, engineers, geologists, hydrologists, natural resource managers and other professionals provide engineering services to the nation including planning, designing, building and operating water resources and other civil works projects.			
USDA Forest Service			
Level: Federal	Hazard: Wildfire	http://www.fs.fed.us	
1400 Independence Ave. SW			
Washington, D.C. 20250-0002		Ph: 202-205-8333	Fx:
Notes: The Forest Service is an agency of the U.S. Department of Agriculture. The Forest Service manages public lands in national forests and grasslands.			
USGS Water Resources			
Level: Federal	Hazard: Multi	www.water.usgs.gov	
6000 J Street		Placer Hall	
Sacramento, CA 95819-6129		Ph: 916-278-3000	Fx: 916-278-3070
Notes: The USGS Water Resources mission is to provide water information that benefits the Nation's citizens: publications, data, maps, and applications software.			
Western States Seismic Policy Council (WSSPC)			
Level: Regional	Hazard: Earthquake	www.wsspc.org/home.html	
125 California Avenue		Suite D201, #1	
Palo Alto, CA 94306		Ph: 650-330-1101	Fx: 650-326-1769
Notes: WSSPC is a regional earthquake consortium funded mainly by FEMA. Its website is a great resource, with information clearly categorized - from policy to engineering to education.			

Westside Economic Collaborative C/O Pacific Western Bank		
Level: Regional	Hazard: Multi	http://www.westside-ia.or
120 Wilshire Boulevard		
Santa Monica, CA 90401	Ph: 310-458-1521	Fx: 310-458-6479
Notes: The Westside Economic Development Collaborative is the first Westside regional economic development corporation. The Westside EDC functions as an information gatherer and resource center, as well as a forum, through bringing business, government, and residents together to address issues affecting the region: Economic Diversity, Transportation, Housing, Workforce Training and Retraining, Lifelong Learning, Tourism, and Embracing Diversity.		

Appendix B: Public Participation

Public participation is a key component to any strategic planning process. It is very important that such broad-reaching plans not be written in isolation. Agency participation offers an opportunity for impacted departments and organizations to provide expertise and insight into the planning process. Citizen participation offers citizens the chance to voice their ideas, interests, and opinions. The Federal Emergency Management Agency also requires public input during the development of mitigation plans.

The City of Vernon Natural Hazards Mitigation Plan integrates a cross-section of public input throughout the planning process. To accomplish this goal, the Hazard Mitigation Planning Team developed a public participation process through four components: (1) developing a Planning Team comprised of knowledgeable representatives from seven departments including: Community Services & Water Department, Light and Power, Health Department, Fire Department, Police Department, Finance Department, and the Emergency Operations Center; (2) soliciting the assistance of local media representatives to announce the progress of the planning activities and to announce the availability of the Draft Natural Hazards Mitigation Plan; (3) creating opportunities for the citizens and public agencies to review the Draft Natural Hazards Mitigation Plan; (4) conducting a public meeting at the City Council where the public had an opportunity to express their views concerning the Draft Natural Hazards Mitigation Plan.

Integrating public participation during the development of the Natural Hazards Mitigation Plan has ultimately resulted in increased public awareness. Through public involvement, the mitigation plan reflects community issues, concerns, and new ideas and perspectives on mitigation opportunities and plan action items.

Hazards Mitigation Planning Team

Hazard mitigation in the City of Vernon was overseen by the Hazard Mitigation Planning Team, which consisted of representatives from various city departments. The members have an understanding of how the community is structured and how residents, businesses, and the environment may be affected by natural hazard events. The Planning Team guided the development of the Plan, and assisted in developing plan goals and action items, identifying stakeholders and plan reviewers, and sharing local expertise to create a more comprehensive plan. The majority of the Planning Team will also participate on the Emergency Operations Center Direction & Control Group, which will be responsible for coordinating the implementation of the Hazard Mitigation Plan. Staff members from various departments attended DMAC training courses.

Meeting #1: Pre-Training September 2, 2004

The meeting was held at Vernon City Hall. Emergency Planning Consultants (EPC) delivered pre-training to the Planning Team and Working Group. The pre-training consisted of the history of the Disaster Mitigation Act of 2000, the purpose and role of hazard mitigation, and the planning process. The Pre-Training lasted approximately 1 hour.

Meeting #2: Kick-Off Meeting September 2, 2004

EPC facilitated a workshop where participants had an opportunity to learn about various natural hazards, assess and rank the local threats, examine hazard maps, and complete the FEMA Worksheets contained in FEMA 386-2 Understanding Your Risks. Part of the discussion included a presentation by EPC of historical disaster events across the country. Those slides served as a backdrop for discussing potential mitigation activities.

There was an extensive discussion on various methods of engaging the public in the mitigation process. The Planning Team prepared a draft media release. The Kick-Off Meeting lasted approximately 2 hours.

Meeting #3 Pre-Training: Mitigation September 2, 2004

The meeting was held at Vernon City Hall. EPC delivered pre-training to the Planning Team. The pre-training consisted of the concepts and issues related to developing mitigation actions. The pre-training lasted approximately 1 hour. During the workshop the team discussed issues associated with the benefit/cost analysis.

Meeting #4 Mitigation Actions Workshops September 2, 2004

EPC discussed the contents of the Hazard Analysis and the Team provided necessary data and maps to EPC for analysis. EPC distributed copies of the Mitigation Actions Planning Tools to assist the Team in developing Goals and Action Items appropriate to their natural hazards. The Planning Tools provided a process for collecting the mitigation actions presently in practice in the City of Vernon, as well as identifying future mitigation actions.

A brainstorming process was then conducted to develop the goals for the Plan. The Planning Team discussed sample goal language then finalizes goal language for the City. Following a discussion of alternative ranking techniques, the Team agreed to cluster the rankings of the Mitigation Actions by type of actions as follows: #1 Multi-Hazard, #2 Earthquakes, #3 Flooding, and #4 Windstorms.

The next task was to examine a FEMA-approved Mitigation Plan to get an idea of how mitigation actions are written. The Planning Tools, developed by EPC, consisted of nearly 300 mitigation actions gathered from dozens of Mitigation Plans across the country.

The Planning Team developed their mitigation actions, utilizing the sample plans and Planning Tools list. Because of the plan samples and Tools, the process of identifying appropriate mitigations actions was accomplished in a very efficient manner. The meeting lasted approximately 3 hours.

Public Meeting

City of Vernon conducted one public meeting where the Draft Natural Hazard Mitigation Plan was presented and discussed. The City Council was very supportive of the overall goal established by the Planning Team to become a Disaster Resistant Community. The Council commended the Planning Team for its expeditious efforts to satisfy the DMA 2000 requirements.

Invitation Process

The Planning Team identified possible public notice sources. A press release was published in the Metropolitan News. The notice was also mailed to effected agencies including the School District, neighboring communities and the Chamber of Commerce.

Results

A Planning Team representative began the presentation by providing an overview of meeting objectives to the participants. The meeting participants were encouraged to present their views and make suggestions on possible mitigation actions. The Planning Team representative presented the staff report on the Plan, including an overview of the Hazard Analysis, Mitigation Goals, and Mitigation Actions. The staff presentation concluded with a summary of the input received during the public review of the document. The representative then fielded questions from the City Council.

The City Council were unanimous in their adoption of the City of Vernon Natural Hazards Mitigation Plan.

Appendix B - Attachment 1

Media Release

Appendix B - Attachment 2

City Council Resolution

Appendix B - Attachment 3

Mailing – List of Reviewers

Appendix C: Benefit/Cost Analysis

Benefit/Cost Analysis is a key mechanism used by the California Office of Emergency Services (OES), the Federal Emergency Management Agency, and other state and federal agencies in evaluating hazard mitigation projects, and is required by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended.

This Appendix outlines several approaches for conducting economic analysis of natural hazard mitigation projects. It describes the importance of implementing mitigation activities, different approaches to economic analysis of mitigation strategies, and methods to calculate costs and benefits associated with mitigation strategies. Information in this section is derived in part from: Federal Emergency Management Agency Publication 331, Report on Costs and Benefits of Natural Hazard Mitigation.

This section is not intended to provide a comprehensive description of benefit/cost analysis, nor is it intended to provide the details of economic analysis methods that can be used to evaluate local projects. It is intended to (1) raise benefit/cost analysis as an important issue, and (2) provide some background on how economic analysis can be used to evaluate mitigation projects.

Why Evaluate Mitigation Strategies?

Mitigation activities reduce the cost of disasters by minimizing property damage, injuries, and the potential for loss of life, and by reducing emergency response costs, which would otherwise be incurred.

Evaluating natural hazard mitigation provides decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects. Evaluating mitigation projects is a complex and difficult undertaking, which is influenced by many variables. First, natural disasters affect all segments of the communities they strike, including individuals, businesses, and public services such as fire, police, utilities, and schools.

Second, while some of the direct and indirect costs of disaster damages are measurable, some of the costs are non-financial and difficult to quantify in dollars. Third, many of the impacts of such events produce “ripple-effects” throughout the community, greatly increasing the disaster’s social and economic consequences.

While not easily accomplished, there is value, from a public policy perspective, in assessing the positive and negative impacts from mitigation activities, and obtaining an instructive benefit/cost comparison. Otherwise, the decision to pursue or not pursue various mitigation options would not be based on an objective understanding of the net benefit or loss associated with these actions.

What are Some Economic Analysis Approaches for Mitigation Strategies?

The approaches used to identify the costs and benefits associated with natural hazard mitigation strategies, measures, or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis. The distinction between the two methods is the way in which the relative costs and benefits are measured. Additionally, there are varying approaches to assessing the value of mitigation for public sector and private sector activities.

Benefit/Cost Analysis

Benefit/Cost Analysis is used in natural hazards mitigation to show if the benefits to life and property protected through mitigation efforts exceed the cost of the mitigation activity. Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster related damages later. Benefit/cost analysis is based on calculating the frequency and severity of a hazard, avoided future damages, and risk.

In benefit/cost analysis, all costs and benefits are evaluated in terms of dollars, and a net benefit/cost ratio is computed to determine whether a project should be implemented (i.e., if net benefits exceed net costs, the project is worth pursuing). A project must have a benefit/cost ratio greater than 1 in order to be funded.

Cost-Effectiveness Analysis

Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. This type of analysis, however, does not necessarily measure costs and benefits in terms of dollars. Determining the economic feasibility of mitigating natural hazards can also be organized according to the perspective of those with an economic interest in the outcome. Hence, economic analysis approaches are covered for both public and private sectors as follows.

Investing in public sector mitigation activities

Evaluating mitigation strategies in the public sector is complicated because it involves estimating all of the economic benefits and costs regardless of who realizes them, and potentially to a large number of people and economic entities. Some benefits cannot be evaluated monetarily, but still affect the public in profound ways. Economists have developed methods to evaluate the economic feasibility of public decisions that involve a diverse set of beneficiaries and non-market benefits.

Investing in private sector mitigation activities

Private sector mitigation projects may occur on the basis of one of two approaches: it may be mandated by a regulation or standard, or it may be economically justified on its own merits. A building or landowner, whether a private entity or a public agency, are required to conform to a mandated standard may consider the following options:

1. Request cost sharing from public agencies;
2. Dispose of the building or land either by sale or demolition;

3. Change the designated use of the building or land and change the hazard mitigation compliance requirement; or
4. Evaluate the most feasible alternatives and initiate the most cost effective hazard mitigation alternative.

Estimating the costs and benefits of a hazard mitigation strategy can be a complex process.

Employing the services of a specialist can assist in this process.

The sale of a building or land triggers another set of concerns. For example, real estate disclosure laws can be developed which require sellers of real property to disclose known defects and deficiencies in the property, including earthquake weaknesses and hazards to prospective purchasers. Correcting deficiencies can be expensive and time consuming, but their existence can prevent the sale of the building. Conditions of a sale regarding the deficiencies and the price of the building can be negotiated between a buyer and seller.

How can an Economic Analysis be conducted?

Benefit/cost analysis and cost-effectiveness analysis are important tools in evaluating whether or not to implement a mitigation activity. A framework for evaluating alternative mitigation activities is outlined below:

1. Identify the Alternatives: Alternatives for reducing risk from natural hazards can include structural projects to enhance disaster resistance, education and outreach, and acquisition or demolition of exposed properties, among others. Different mitigation project can assist in minimizing risk to natural hazards, but do so at varying economic costs.

2. Calculate the Costs and Benefits: Choosing economic criteria is essential to systematically calculating costs and benefits of mitigation projects and selecting the most appropriate alternative. Potential economic criteria to evaluate alternatives include:

- **Determine the project cost.** This may include initial project development costs, and repair and operating costs of maintaining projects over time.

- **Estimate the benefits.** Projecting the benefits or cash flow resulting from a project can be difficult. Expected future returns from the mitigation effort depend on the correct specification of the risk and the effectiveness of the project, which may not be well known. Expected future costs depend on the physical durability and potential economic obsolescence of the investment. This is difficult to project. These considerations will also provide guidance in selecting an appropriate

salvage value. Future tax structures and rates must be projected. Financing alternatives must be researched, and they may include retained earnings, bond and stock issues, and commercial loans.

- **Consider costs and benefits to society and the environment.** These are not easily measured, but can be assessed through a variety of economic tools including existence value or contingent value theories. These theories provide quantitative data on the value people attribute to physical or social environments. Even without hard data, however, impacts of structural projects to the physical environment or to society should be considered when implementing mitigation projects.

- **Determine the correct discount rate.** Determination of the discount rate can just be the risk-free cost of capital, but it may include the decision maker's time preference and also a risk premium. Including inflation should also be considered.

3. Analyze and Rank the Alternatives: Once costs and benefits have been quantified, economic analysis tools can rank the alternatives. Two methods for determining the best alternative given varying costs and benefits include net present value and internal rate of return.

- **Net present value.** Net present value is the value of the expected future returns of an investment minus the value of expected future cost expressed in today's dollars. If the net present value is greater than the project costs, the project may be determined feasible for implementation. Selecting the discount rate, and identifying the present and future costs and benefits of the project calculates the net present value of projects.

- **Internal Rate of Return.** Using the internal rate of return method to evaluate mitigation projects provides the interest rate equivalent to the dollar returns expected from the project. Once the rate has been calculated, it can be compared to rates earned by investing in alternative projects. Projects may be feasible to implement when the internal rate of return is greater than the total costs of the project.

Once the mitigation projects are ranked on the basis of economic criteria, decision-makers can consider other factors, such as risk; project effectiveness; and economic, environmental, and social returns in choosing the appropriate project for implementation.

How are Benefits of Mitigation Calculated?

Economic Returns of Natural Hazard Mitigation

The estimation of economic returns, which accrue to building or land owner as a result of natural hazard mitigation, is difficult. Owners evaluating the economic feasibility of mitigation should consider reductions in physical damages and financial losses. A partial

list follows:

- Building damages avoided
- Content damages avoided
- Inventory damages avoided
- Rental income losses avoided
- Relocation and disruption expenses avoided
- Proprietor's income losses avoided

These parameters can be estimated using observed prices, costs, and engineering data. The difficult part is to correctly determine the effectiveness of the hazard mitigation project and the resulting reduction in damages and losses. Equally as difficult is assessing the probability that an event will occur. The damages and losses should only include those that will be borne by the owner. The salvage value of the investment can be important in determining economic feasibility. Salvage value becomes more important as the time horizon of the owner declines. This is important because most businesses depreciate assets over a period of time.

Additional Costs from Natural Hazards

Property owners should also assess changes in a broader set of factors that can change as a result of a large natural disaster. These are usually termed "indirect" effects, but they can have a very direct effect on the economic value of the owner's building or land.

They can be positive or negative, and include changes in the following:

- Commodity and resource prices
- Availability of resource supplies
- Commodity and resource demand changes
- Building and land values
- Capital availability and interest rates
- Availability of labor
- Economic structure
- Infrastructure
- Regional exports and imports
- Local, state, and national regulations and policies
- Insurance availability and rates

Changes in the resources and industries listed above are more difficult to estimate and require models that are structured to estimate total economic impacts. Total economic impacts are the sum of direct and indirect economic impacts. Total economic impact models are usually not combined with economic feasibility models. Many models exist to estimate total economic impacts of changes in an economy. Decision makers should understand the total economic impacts of natural disasters in order to calculate the benefits of a mitigation activity. This suggests that understanding the local economy is an important first step in being able to understand the potential impacts of a disaster, and the benefits of mitigation activities.

Additional Considerations

Conducting an economic analysis for potential mitigation activities can assist decision-makers in choosing the most appropriate strategy for their community to reduce risk and prevent loss from natural hazards. Economic analysis can also save time and resources from being spent on inappropriate or unfeasible projects. Several resources and models are listed on the following page that can assist in conducting an economic analysis for natural hazard mitigation activities.

Benefit/cost analysis is complicated, and the numbers may divert attention from other important issues. It is important to consider the qualitative factors of a project associated with mitigation that cannot be evaluated economically. There are alternative approaches to implementing mitigation projects. Many communities are looking towards developing multi-objective projects. With this in mind, opportunity rises to develop strategies that integrate natural hazard mitigation with projects related to watersheds, environmental planning, community economic development, and small business development, among others. Incorporating natural hazard mitigation with other community projects can increase the viability of project implementation.

Resources

CUREe Kajima Project, Methodologies For Evaluating The Socio-Economic Consequences Of Large Earthquakes, Task 7.2 Economic Impact Analysis, Prepared by University of California, Berkeley Team, Robert A. Olson, VSP Associates, Team Leader; John M. Eidinger, G&E Engineering Systems; Kenneth A. Goettel, Goettel and Associates Inc.; and Gerald L. Horner, Hazard Mitigation Economics Inc., 1997.

Federal Emergency Management Agency, Benefit/Cost Analysis of Hazard Mitigation Projects, Riverine Flood, Version 1.05, Hazard Mitigation Economics Inc., 1996.

Federal Emergency Management Agency Report on Costs and Benefits of Natural Hazard Mitigation. Publication 331, 1996.

Goettel & Horner Inc., Earthquake Risk Analysis Volume III: The Economic Feasibility of Seismic Rehabilitation of Buildings in The City of Portland, Submitted to the Bureau of Buildings, City of Portland, August 30, 1995.

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Appendix D: Acronyms

Federal Acronyms

AASHTO	American Association of State Highway and Transportation Officials
ATC	Applied Technology Council
b/ca	benefit/cost analysis
BFE	Base Flood Elevation
BLM	Bureau of Land Management
BSSC	Building Seismic Safety Council
CDBG	Community Development Block Grant
CFR	Code of Federal Regulations
CRS	Community Rating System
DOE	Department of Energy
EDA	Economic Development Administration
EPA	Environmental Protection Agency
ER	Emergency Relief
EWP	Emergency Watershed Protection (NRCS Program)
FAS	Federal Aid System
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance (FEMA Program)
FTE	Full Time Equivalent
GIS	Geographic Information System
GNS	Institute of Geological and Nuclear Sciences (International)
GSA	General Services Administration
HAZUS	Hazards U.S.
HMGP	Hazard Mitigation Grant Program
HMST	Hazard Mitigation Survey Team
HUD	Housing and Urban Development (United States, Department of)
IBHS	Institute for Business and Home Safety
ICC	Increased Cost of Compliance
IHMT	Interagency Hazard Mitigation Team
NCDC	National Climate Data Center
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NHMP	Natural Hazard Mitigation Plan (also known as "409 Plan")
NIBS	National Institute of Building Sciences
NIFC	National Interagency Fire Center
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWS	National Weather Service

SBA	Small Business Administration
SHMO	State Hazard Mitigation Officer
TOR	Transfer of Development Rights
UGB	Urban Growth Boundary
URM	Unreinforced Masonry
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USDA	United States Department of Agriculture
USFA	United States Fire Administration
USFS	United States Forest Service
USGS	United States Geological Survey
WSSPC	Western States Seismic Policy Council

California Acronyms

A&W	Alert and Warning
AA	Administering Areas
AAR	After Action Report
ARC	American Red Cross
ARP	Accidental Risk Prevention
ATC20	Applied Technology Council20
ATC21	Applied Technology Council21
BCP	Budget Change Proposal
BSA	California Bureau of State Audits
CAER	Community Awareness & Emergency Response
CalARP	California Accidental Release Prevention
CalBO	California Building Officials
CalEPA	California Environmental Protection Agency
CalREP	California Radiological Emergency Plan
CALSTARS	California State Accounting Reporting System
CalTRANS	California Department of Transportation
CBO	Community Based Organization
CD	Civil Defense
CDF	California Department of Forestry and Fire Protection
CDMG	California Division of Mines and Geology
CEC	California Energy Commission
CEPEC	California Earthquake Prediction Evaluation Council
CESRS	California Emergency Services Radio System
CHIP	California Hazardous Identification Program
CHMIRS	California Hazardous Materials Incident Reporting System
CHP	California Highway Patrol
CLETS	California Law Enforcement Telecommunications System
CSTI	California Specialized Training Institute
CUEA	California Utilities Emergency Association
CUPA	Certified Unified Program Agency
DAD	Disaster Assistance Division (California Office of Emergency Services)

DFO	Disaster Field Office
DGS	California Department of General Services
DHSRHB	California Department of Health Services, Radiological Health Branch
DO	Duty Officer
DOC	Department Operations Center
DOF	California Department of Finance
DOJ	California Department of Justice
DPA	California Department of Personnel Administration
DPIG	Disaster Preparedness Improvement Grant
DR	Disaster Response
DSA	Division of the State Architect
DSR	Damage Survey Report
DSW	Disaster Service Worker
DWR	California Department of Water Resources
EAS	Emergency Alerting System
EDIS	Emergency Digital Information System
EERI	Earthquake Engineering Research Institute
EMA	Emergency Management Assistance
EMI	Emergency Management Institute
EMMA	Emergency Managers Mutual Aid
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPEDAT	Early Post Earthquake Damage Assessment Tool
EPI	Emergency Public Information
EPIC	Emergency Public Information Council
ESC	Emergency Services Coordinator
FAY	Federal Award Year
FDAA	Federal Disaster Assistance Administration
FEAT	Governor's Flood Emergency Action Team
FEMA	Federal Emergency Management Agency
FFY	Federal Fiscal Year
FIR	Final Inspection Reports
FIRESCOPE	Firefighting Resources of Southern California Organized for Potential Emergencies
FMA	Flood Management Assistance
FSR	Feasibility Study Report
FY	Fiscal Year
GIS	Geographical Information System
HAZMAT	Hazardous Materials
HAZMIT	Hazardous Mitigation
HAZUS	Hazards United States (an earthquake damage assessment prediction tool)
HAD	Housing and Community Development
HEICS	Hospital Emergency Incident Command System
HEPG	Hospital Emergency Planning Guidance
HIA	Hazard Identification and Analysis Unit

HMEP	Hazardous Materials Emergency Preparedness
HMGP	Hazard Mitigation Grant Program
IDE	Initial Damage Estimate
IA	Individual Assistance
IFG	Individual & Family Grant (program)
IRG	Incident Response Geographic Information System
IPA	Information and Public Affairs (of state Office of Emergency Services)
LAN	Local Area Network
LEMMA	Law Enforcement Master Mutual Aid
LEPC	Local Emergency Planning Committee
MARAC	Mutual Aid Regional Advisory Council
MHFP	Multi-Hazard Functional Plan
MHID	Multi-Hazard Identification
MOU	Memorandum of Understanding
NBC	Nuclear, Biological, Chemical
NEMA	National Emergency Management Agency
NEMIS	National Emergency Management Information System
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Association
NPP	Nuclear Power Plant
NSF	National Science Foundation
NWS	National Weather Service
OA	Operational Area
OASIS	Operational Area Satellite Information System
OCC	Operations Coordination Center
OCD	Office of Civil Defense
OEP	Office of Emergency Planning
OES	California Governor's Office of Emergency Services
OSHDP	Office of Statewide Health Planning and Development
OSPR	Oil Spill Prevention and Response
PA	Public Assistance
PC	Personal Computer
PDA	Preliminary Damage Assessment
PIO	Public Information Office
POST	Police Officer Standards and Training
PPA/CA	Performance Partnership Agreement/Cooperative Agreement (FEMA)
PSA	Public Service Announcement
PTAB	Planning and Technological Assistance Branch
PTR	Project Time Report
RA	Regional Administrator (OES)
RADEF	Radiological Defense (program)
RAMP	Regional Assessment of Mitigation Priorities
RAPID	Railroad Accident Prevention & Immediate Deployment
RDO	Radiological Defense Officer
RDMHC	Regional Disaster Medical Health Coordinator
REOC	Regional Emergency Operations Center

REPI	Reserve Emergency Public Information
RES	Regional Emergency Staff
RIMS	Response Information Management System
RMP	Risk Management Plan
RPU	Radiological Preparedness Unit (OES)
RRT	Regional Response Team
SAM	State Administrative Manual
SARA	Superfund Amendments & Reauthorization Act
SAVP	Safety Assessment Volunteer Program
SBA	Small Business Administration
SCO	California State Controller's Office
SEMS	Standardized Emergency Management System
SEPIC	State Emergency Public Information Committee
SLA	State and Local Assistance
SONGS	San Onofre Nuclear Generating Station
SOP	Standard Operating Procedure
SWEPC	Statewide Emergency Planning Committee
TEC	Travel Expense Claim
TRU	Transuranic
TTT	Train the Trainer
UPA	Unified Program Account
UPS	Uninterrupted Power Source
USAR	Urban Search and Rescue
USGS	United States Geological Survey
WC	California State Warning Center
WAN	Wide Area Network
WIPP	Waste Isolation Pilot Project

Appendix E: Glossary

Acceleration	The rate of change of velocity with respect to time. Acceleration due to gravity at the earth's surface is 9.8 meters per second squared. That means that every second that something falls toward the surface of earth its velocity increases by 9.8 meters per second.
Asset	Any manmade or natural feature that has value, including, but not limited to people; buildings; infrastructure like bridges, roads, and sewer and water systems; lifelines like electricity and communication resources; or environmental, cultural, or recreational features like parks, dunes, wetlands, or landmarks.
Base Flood	Flood that has a 1 percent probability of being equaled or exceeded in any given year. Also known as the 100-year flood.
Base Flood Elevation (BFE)	Elevation of the base flood in relation to a specified datum, such as the National Geodetic Vertical Datum of 1929. The Base Flood Elevation is used as the standard for the National Flood Insurance Program.
Bedrock	The solid rock that underlies loose material, such as soil, sand, clay, or gravel.
Building	A structure that is walled and roofed, principally above ground and permanently affixed to a site. The term includes a manufactured home on a permanent foundation on which the wheels and axles carry no weight.
Coastal High Hazard Area	Area, usually along an open coast, bay, or inlet that is subject to inundation by storm surge and, in some instances, wave action caused by storms or seismic sources.
Coastal Zones	The area along the shore where the ocean meets the land as the surface of the land rises above the ocean. This land/water interface includes barrier islands, estuaries, beaches, coastal wetlands, and land areas having direct drainage to the ocean.
Community Rating System (CRS)	An NFIP program that provides incentives for NFIP communities to complete activities that reduce flood hazard risk. When the community completes specified activities, the insurance premiums of policyholders in these communities are reduced.
Computer-Aided Design And Drafting (CADD)	A computerized system enabling quick and accurate electronic 2-D and 3-D drawings, topographic mapping, site plans, and profile/cross-section drawings.
Contour	A line of equal ground elevation on a topographic (contour) map.

Critical Facility	Facilities that are critical to the health and welfare of the population and that are especially important following hazard events. Critical facilities include, but are not limited to, shelters, police and fire stations, and hospitals.
Debris	The scattered remains of assets broken or destroyed in a hazard event. Debris caused by a wind or water hazard event can cause additional damage to other assets.
Digitize	To convert electronically points, lines, and area boundaries shown on maps into x, y coordinates (e.g., latitude and longitude, universal transverse mercator (UTM), or table coordinates) for use in computer applications.
Displacement Time	The average time (in days) which the building's occupants typically must operate from a temporary location while repairs are made to the original building due to damages resulting from a hazard event.
Duration	How long a hazard event lasts.
Earthquake	A sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of earth's tectonic plates.
Erosion	Wearing away of the land surface by detachment and movement of soil and rock fragments, during a flood or storm or over a period of years, through the action of wind, water, or other geologic processes.
Erosion Hazard Area	Area anticipated being lost to shoreline retreat over a given period of time. The projected inland extent of the area is measured by multiplying the average annual long-term recession rate by the number of years desired.
Essential Facility	Elements important to ensure a full recovery of a community or state following a hazard event. These would include: government functions, major employers, banks, schools, and certain commercial establishments, such as grocery stores, hardware stores, and gas stations.
Extent	The size of an area affected by a hazard or hazard event.
Extratropical Cyclone	Cyclonic storm events like Nor'easters and severe winter low-pressure systems. Both West and East coasts can experience these non-tropical storms that produce gale-force winds and precipitation in the form of heavy rain or snow. These cyclonic storms, commonly called Nor'easters on the East Coast because of the direction of the storm winds, can last for several days and can be very large – 1,000-mile wide storms are not uncommon.

Fault	A fracture in the continuity of a rock formation caused by a shifting or dislodging of the earth's crust, in which adjacent surfaces are differentially displaced parallel to the plane of fracture.
Federal Emergency Management Agency (FEMA)	Independent agency created in 1978 to provide a single point of accountability for all Federal activities related to disaster mitigation and emergency preparedness, response and recovery.
Fire Potential Index (FPI)	Developed by USGS and USFS to assess and map fire hazard potential over broad areas. Based on such geographic information, national policy makers and on-the-ground fire managers established priorities for prevention activities in the defined area to reduce the risk of managed and wildfire ignition and spread. Prediction of fire hazard shortens the time between fire ignition and initial attack by enabling fire managers to pre-allocate and stage suppression forces to high fire risk areas.
Flash Flood	A flood event occurring with little or no warning where water levels rise at an extremely fast rate.
Flood	A general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from any source, or (3) mudflows or the sudden collapse of shoreline land.
Flood Depth	Height of the flood water surface above the ground surface.
Flood Elevation	Elevation of the water surface above an established datum, e.g. National Geodetic Vertical Datum of 1929, North American Vertical Datum of 1988, or Mean Sea Level.
Flood Hazard Area	The area shown to be inundated by a flood of a given magnitude on a map.
Flood Insurance Rate Map (FIRM)	Map of a community, prepared by the Federal Emergency Management Agency that shows both the special flood hazard areas and the risk premium zones applicable to the community.
Flood Insurance Study (FIS)	A study that provides an examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations in a community or communities.
Floodplain	Any land area, including watercourse, susceptible to partial or complete inundation by water from any source.

Frequency	A measure of how often events of a particular magnitude are expected to occur. Frequency describes how often a hazard of a specific magnitude, duration, and/or extent typically occurs, on average. Statistically, a hazard with a 100-year recurrence interval is expected to occur once every 100 years on average, and would have a 1 percent chance – its probability – of happening in any given year. The reliability of this information varies depending on the kind of hazard being considered.
Fujita Scale of Tornado Intensity	Rates tornadoes with numeric values from F0 to F5 based on tornado wind speed and damage sustained. An F0 indicates minimal damage such as broken tree limbs or signs, while and F5 indicated severe damage sustained.
Functional Downtime	The average time (in days) during which a function (business or service) is unable to provide its services due to a hazard event.
Geographic Area Impacted	The physical area in which the effects of the hazard are experienced.
Geographic Information Systems (GIS)	A computer software application that relates physical features on the earth to a database to be used for mapping and analysis.
Ground Motion	The vibration or shaking of the ground during an earthquake. When a fault ruptures, seismic waves radiate, causing the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter, but soft soils can further amplify ground motions
Hazard	A source of potential danger or adverse condition. Hazards in this how to series will include naturally occurring events such as floods, earthquakes, tornadoes, tsunamis, coastal storms, landslides, and wildfires that strike populated areas. A natural event is a hazard when it has the potential to harm people or property.
Hazard Event	A specific occurrence of a particular type of hazard.
Hazard Identification	The process of identifying hazards that threaten an area.
Hazard Mitigation	Sustained actions taken to reduce or eliminate long-term risk from hazards and their effects.
Hazard Profile	A description of the physical characteristics of hazards and a determination of various descriptors including magnitude, duration, frequency, probability, and extent. In most cases, a community can most easily use these descriptors when they are recorded and displayed as maps.

HAZUS (Hazards U.S.)	A GIS-based nationally standardized earthquake loss estimation tool developed by FEMA.
Hurricane	An intense tropical cyclone, formed in the atmosphere over warm ocean areas, in which wind speeds reach 74-miles-per-hour or more and blow in a large spiral around a relatively calm center or "eye." Hurricanes develop over the north Atlantic Ocean, northeast Pacific Ocean, or the south Pacific Ocean east of 160°E longitude. Hurricane circulation is counter-clockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.
Hydrology	The science of dealing with the waters of the earth. A flood discharge is developed by a hydrologic study.
Infrastructure	Refers to the public services of a community that have a direct impact on the quality of life. Infrastructure includes communication technology such as phone lines or Internet access, vital services such as public water supplies and sewer treatment facilities, and includes an area's transportation system such as airports, heliports; highways, bridges, tunnels, roadbeds, overpasses, railways, bridges, rail yards, depots; and waterways, canals, locks, seaports, ferries, harbors, dry docks, piers and regional dams.
Intensity	A measure of the effects of a hazard event at a particular place.
Landslide	Downward movement of a slope and materials under the force of gravity.
Lateral Spreads	Develop on gentle slopes and entail the sidelong movement of large masses of soil as an underlying layer liquefies in a seismic event. The phenomenon that occurs when ground shaking causes loose soils to lose strength and act like viscous fluid. Liquefaction causes two types of ground failure: lateral spread and loss of bearing strength.
Liquefaction	Results when the soil supporting structures liquefies. This can cause structures to tip and topple.
Lowest Floor	Under the NFIP, the lowest floor of the lowest enclosed area (including basement) of a structure.
Magnitude	A measure of the strength of a hazard event. The magnitude (also referred to as severity) of a given hazard event is usually determined using technical measures specific to the hazard.

Mitigation Plan	A systematic evaluation of the nature and extent of vulnerability to the effects of natural hazards typically present in the state and includes a description of actions to minimize future vulnerability to hazards.
National Flood Insurance Program (NFIP)	Federal program created by Congress in 1968 that makes flood insurance available in communities that enact minimum floodplain management regulations in 44 CFR §60.3.
National Geodetic Vertical Datum of 1929 (NGVD)	Datum established in 1929 and used in the NFIP as a basis for measuring flood, ground, and structural elevations, previously referred to as Sea Level Datum or Mean Sea Level. The Base Flood Elevations shown on most of the Flood Insurance Rate Maps issued by the Federal Emergency Management Agency are referenced to NGVD.
National Weather Service (NWS)	Prepares and issues flood, severe weather, and coastal storm warnings and can provide technical assistance to Federal and state entities in preparing weather and flood warning plans.
Nor'easter	An extra-tropical cyclone producing gale-force winds and precipitation in the form of heavy snow or rain.
Outflow	Follows water inundation creating strong currents that rip at structures and pound them with debris, and erode beaches and coastal structures.
Planimetric	Describes maps that indicate only man-made features like buildings.
Planning	The act or process of making or carrying out plans; the establishment of goals, policies and procedures for a social or economic unit.
Probability	A statistical measure of the likelihood that a hazard event will occur.
Recurrence Interval	The time between hazard events of similar size in a given location. It is based on the probability that the given event will be equaled or exceeded in any given year.
Repetitive Loss Property	A property that is currently insured for which two or more National Flood Insurance Program losses (occurring more than ten days apart) of at least \$1000 each have been paid within any 10-year period since 1978.
Replacement Value	The cost of rebuilding a structure. This is usually expressed in terms of cost per square foot, and reflects the present-day cost of labor and materials to construct a building of a particular size, type and quality.
Richter Scale	A numerical scale of earthquake magnitude devised by seismologist C.F. Richter in 1935.

Risk	The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate or low likelihood of sustaining damage above a particular threshold due to a specific type of hazard event. It also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.
Riverine	Of or produced by a river.
Scale	A proportion used in determining a dimensional relationship; the ratio of the distance between two points on a map and the actual distance between the two points on the earth's surface.
Scarp	A steep slope.
Scour	Removal of soil or fill material by the flow of flood waters. The term is frequently used to describe storm-induced, localized conical erosion around pilings and other foundation supports where the obstruction of flow increases turbulence.
Seismicity	Describes the likelihood of an area being subject to earthquakes.
Special Flood Hazard Area (SFHA)	An area within a floodplain having a 1 percent or greater chance of flood occurrence in any given year (100-year floodplain); represented on Flood Insurance Rate Maps by darkly shaded areas with zone designations that include the letter A or V.
Stafford Act	The Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-107 was signed into law November 23, 1988 and amended the Disaster Relief Act of 1974, PL 93-288. The Stafford Act is the statutory authority for most Federal disaster response activities, especially as they pertain to FEMA and its programs.
State Hazard Mitigation Officer (SHMO)	The representative of state government who is the primary point of contact with FEMA, other state and Federal agencies, and local units of government in the planning and implementation of pre- and post-disaster mitigation activities.
Storm Surge	Rise in the water surface above normal water level on the open coast due to the action of wind stress and atmospheric pressure on the water surface.
Structure	Something constructed. (See also Building)
Substantial Damage	Damage of any origin sustained by a structure in a Special Flood Hazard Area whereby the cost of restoring the structure to its before-damaged condition would equal or exceeds 50 percent of the market value of the structure before the damage.

Super Typhoon	A typhoon with maximum sustained winds of 150 mph or more.
Surface Faulting	The differential movement of two sides of a fracture – in other words, the location where the ground breaks apart. The length, width, and displacement of the ground characterize surface faults.
Tectonic Plate	Torsionally rigid, thin segments of the earth's lithosphere that may be assumed to move horizontally and adjoin other plates. It is the friction between plate boundaries that cause seismic activity.
Topographic	Characterizes maps that show natural features and indicate the physical shape of the land using contour lines. These maps may also include manmade features.
Tornado	A violently rotating column of air extending from a thunderstorm to the ground.
Tropical Cyclone	A generic term for a cyclonic, low-pressure system over tropical or subtropical waters.
Tropical Depression	A tropical cyclone with maximum sustained winds of less than 39 mph.
Tropical Storm	A tropical cyclone with maximum sustained winds greater than 39 mph and less than 74 mph.
Tsunami	Great sea wave produced by submarine earth movement or volcanic eruption.
Typhoon	A special category of tropical cyclone peculiar to the western North Pacific Basin, frequently affecting areas in the vicinity of Guam and the North Mariana Islands. Typhoons whose maximum sustained winds attain or exceed 150 mph are called super typhoons.
Vulnerability	Describes how exposed or susceptible to damage an asset is. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power – if an electric substation is flooded, it will affect not only the substation itself, but a number of businesses as well. Often, indirect effects can be much more widespread and damaging than direct ones.
Vulnerability Assessment	The extent of injury and damage that may result from a hazard event of a given intensity in a given area. The vulnerability assessment should address impacts of hazard events on the existing and future built environment.

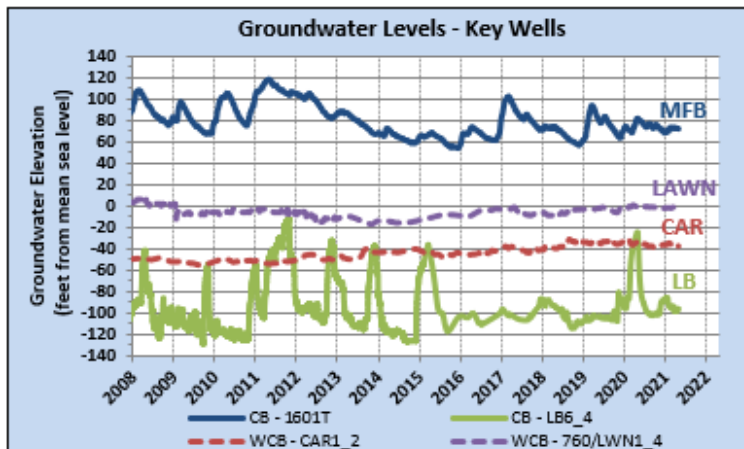
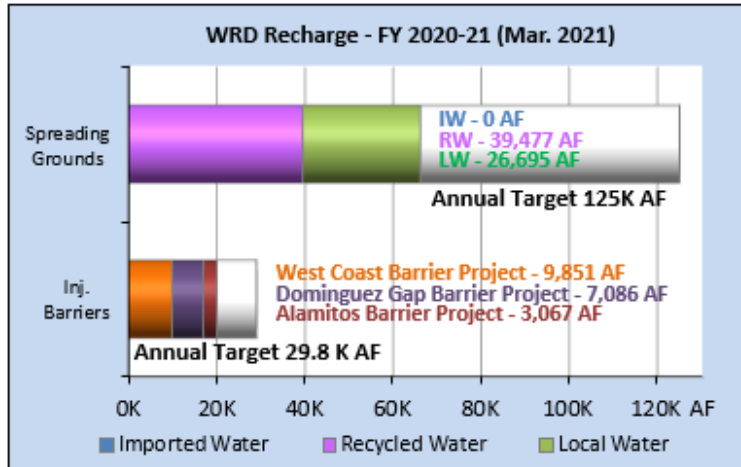
Water Displacement	When a large mass of earth on the ocean bottom sinks or uplifts, the column of water directly above it is displaced, forming the tsunami wave. The rate of displacement, motion of the ocean floor at the epicenter, the amount of displacement of the rupture zone, and the depth of water above the rupture zone all contribute to the intensity of the tsunami.
Wave Run-up	The height that the wave extends up to on steep shorelines, measured above a reference level (the normal height of the sea, corrected to the state of the tide at the time of wave arrival).
Wildfire	An uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures.
Zone	A geographical area shown on a Flood Insurance Rate Map (FIRM) that reflects the severity or type of flooding in the area.

Appendix V

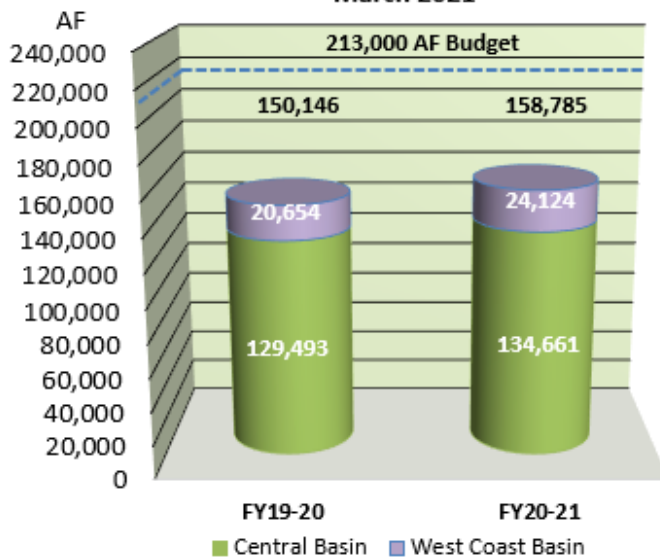
WRD Groundwater Basin Update for May 2021

GROUNDWATER BASIN UPDATE FOR MAY 2021

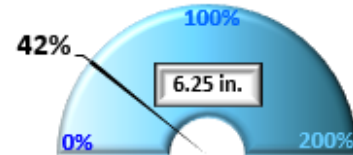
GROUNDWATER BASINS AT A GLANCE*



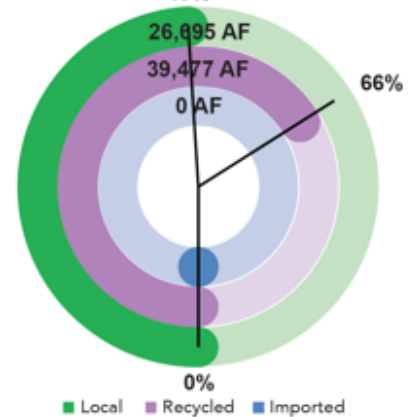
Basin Pumping (Q) March 2021



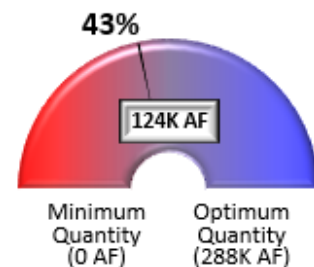
Precipitation % of Normal to Date Oct. 1 - May 3



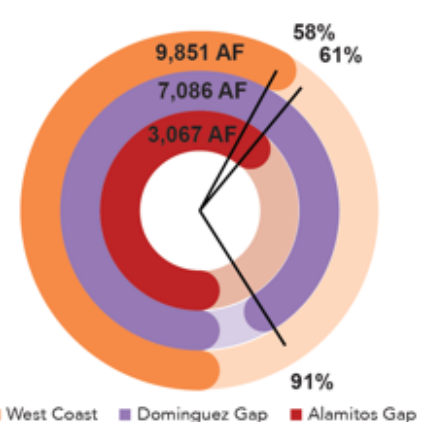
Spreading Grounds Recharge Fiscal Year to Date



GW Basin Operating Range



Seawater Barrier Recharge Fiscal Year to Date



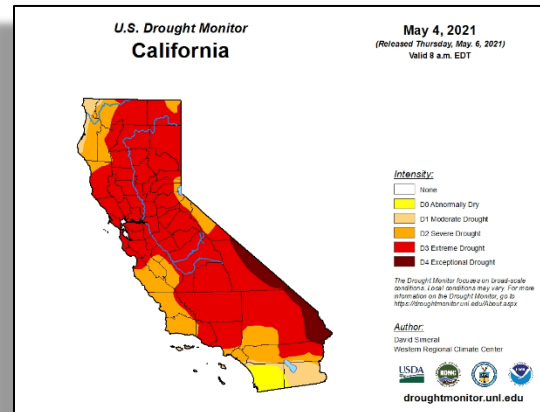
* - Preliminary numbers, subject to change.

SUMMARY

Staff monitors groundwater conditions in the District's service area throughout the year. A summary of the latest information is presented below.

Precipitation (October 1 – May 3, 2021)

The WRD precipitation index reports that for the 2020-21 Water Year, there has been below average rainfall (6.25 inches) through May 3, 2021. The normal rainfall for this time period is 14.87 inches, so the District is 42% of normal. As of May 4, 2021, the U.S. Drought Monitor is reporting 100% of the State is abnormally dry, 98% under moderate, 93% under severe, 73% under extreme, and 5% exceptional drought conditions.



Snowpack (Snow Water Content [SWE] as of May 4, 2021)

In 1929, the State established the California Cooperative Snow Surveys Program with the California Department of Water Resources as the coordinator. Today, over 50 state, national, and private agencies collaborate in collecting snow data from over 300 snow courses with more than 60 of the courses being the original courses established in the early 1900's. The average snow course is 1,000 feet long and consist of about 10 sample points. Anywhere from two to six courses are measured per day depending on weather and access method.

The snow survey is completed using a snow sampling tube equipped with a cutter on the end that is driven through the snow measuring the depth and obtaining a snow core. The snow core is then weighed and the snow water content (or snow water equivalent) calculated. The surveys are completed throughout the winter by returning to the same sample points throughout the season to observe the changing conditions. From February through May the data is used by the State to forecast snow melt runoff. Many snow courses are only measured on or around April 1st, and since it is presumed that the snow accumulates up to April 1st and melts thereafter, April 1st is the benchmark for historic data comparisons.

NORTH

Data For: 04-May-2021

Number of Stations Reporting	31
Average snow water equivalent	2.5"
Percent of April 1 Average	9%
Percent of normal for this date	14%

CENTRAL

Data For: 04-May-2021

Number of Stations Reporting	41
Average snow water equivalent	4.7"
Percent of April 1 Average	16%
Percent of normal for this date	21%

SOUTH

Data For: 04-May-2021

Number of Stations Reporting	27
Average snow water equivalent	1.7"
Percent of April 1 Average	7%
Percent of normal for this date	9%

STATEWIDE SUMMARY

Data For: 04-May-2021

Number of Stations Reporting	99
Average snow water equivalent	3.2"
Percent of April 1 Average	11%
Percent of normal for this date	15%

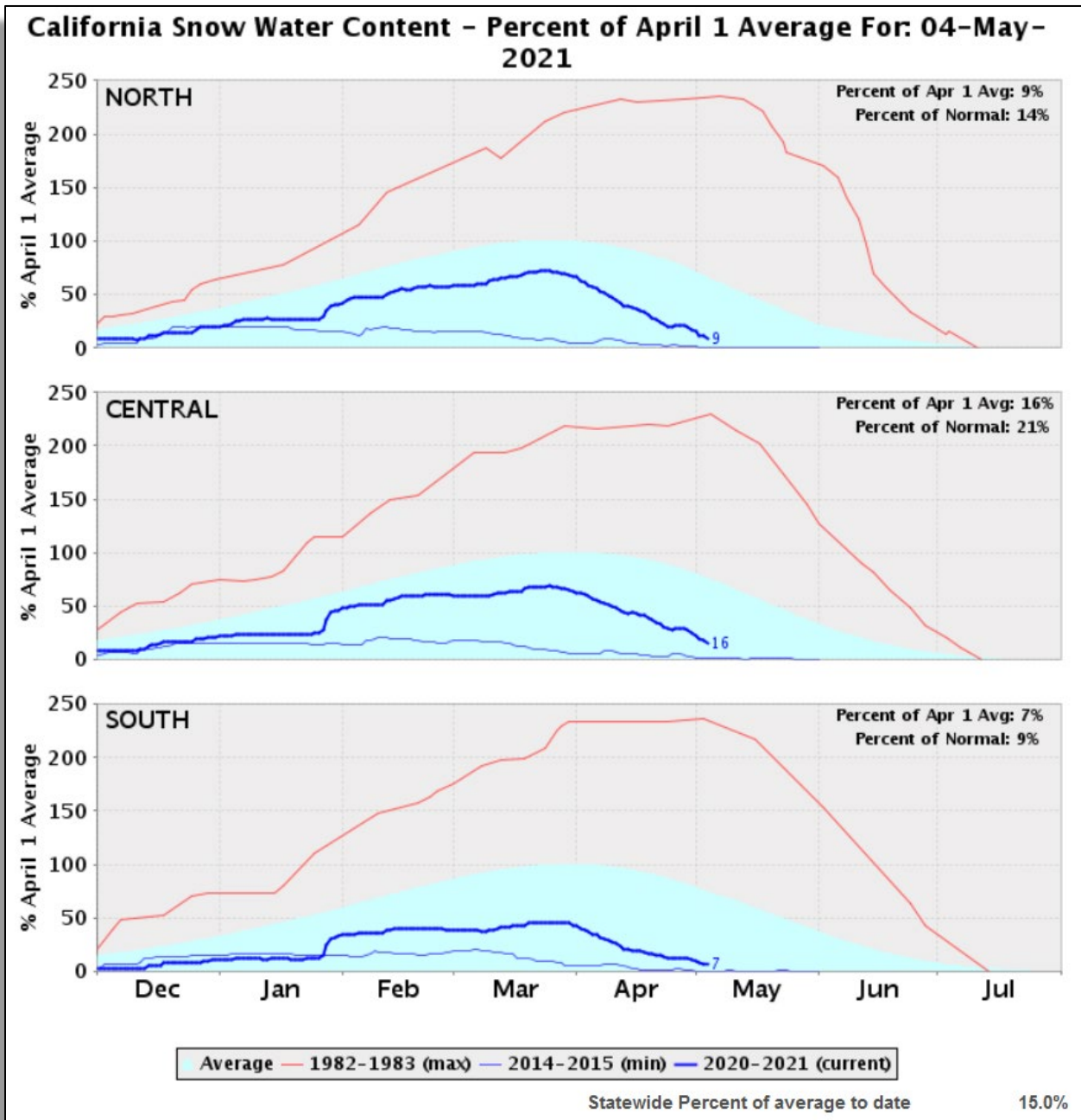
Snow Water Equivalent (SWE):

Northern Sierra Nevada – 2.5 in., 14% of normal to date and 9% of April 1st average

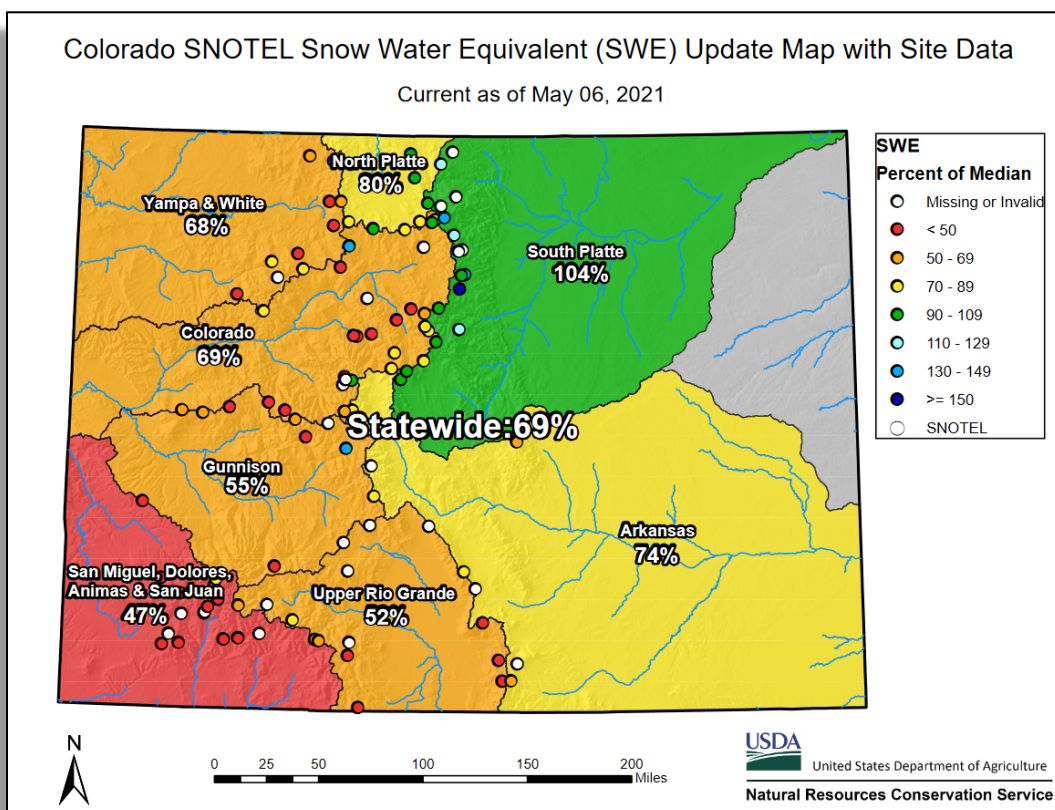
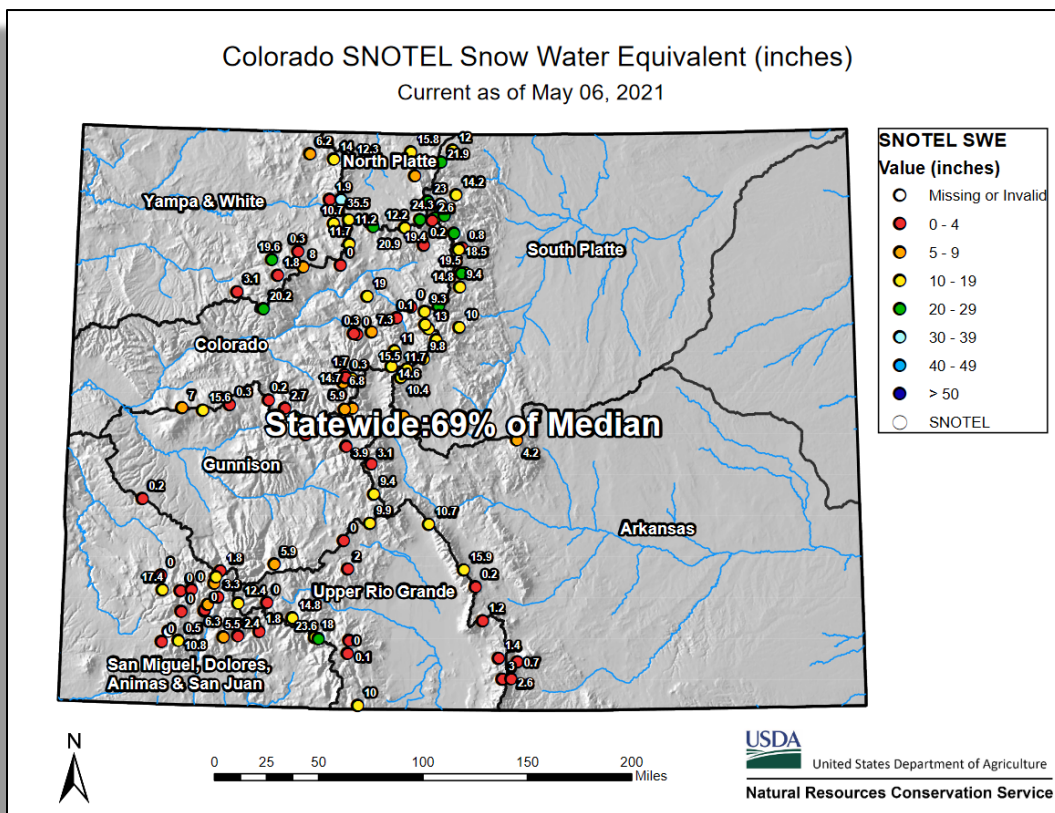
Central Sierra Nevada – 4.7 in., 21% of normal to date and 16% of April 1st average

Southern Sierra Nevada – 1.7 in., 9% of normal to date and 7% of April 1st average

Statewide Summary – 3.2 in., 15% of normal to date and 11% of April 1st average

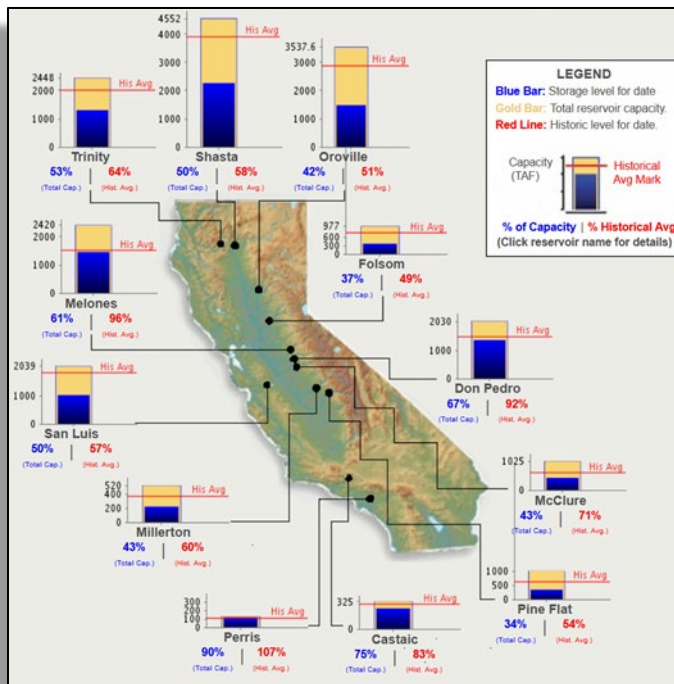


Colorado Snow Survey (May 6, 2021)



Reservoirs (as of May 3, 2021)

For all 16 reservoirs reported monthly to the committee, water levels have increased in 10 reservoirs compared to levels recorded in the previous month and decreased in 6 reservoirs. The largest increase (0.06 million acre feet) occurred at Pine Flat Reservoir. The smallest increased (<0.01 million acre feet) occurred at Trinity Lake. The largest decrease (-0.44 million acre feet) occurred at Lake Mead. The smallest decrease (<0.0 million acre feet) occurred at Lakes Folsom, Castaic, Perris, Silverwood, and Diamond Valley.



MWD Reservoirs (SWP) Storage in Million Acre Feet

Reservoir	Capacity	Storage	% Full	Change
Trinity Lake	2.45	1.31	53%	0.00
Lake Shasta	4.55	2.27	50%	-0.12
Lake Oroville	3.54	1.48	42%	0.03
Folsom Lake	0.98	0.36	37%	0.00
New Melones L.	2.40	1.45	61%	-0.08
Don Pedro Res	2.03	1.37	67%	-0.02
Lake McClure	1.02	0.44	43%	0.04
San Luis Res	2.04	1.02	50%	-0.08
Millerton Lake	0.52	0.22	43%	0.04
Pine Flat	1.00	0.34	34%	0.06
Castaic Lake	0.33	0.24	75%	0.00
Lake Perris	0.13	0.12	90%	0.00
L. Silverwood	0.08	0.07	86%	0.00

MWD Reservoirs (CRA) Storage in Million Acre Feet

Reservoir	Capacity	Storage	% Full	Change
Powell	24.32	8.47	35%	-0.33
Mead	26.12	9.91	38%	-0.44
DVL	0.81	0.67	83%	0.00

Black Text - Decrease or no change in storage since the last report.
 Green Text - Increase in storage since the last report.

These 16 reservoirs are at 41% capacity (29.74 million acre feet) which is down 0.90 million acre feet from the prior month (-0.13 million acre feet State Water Project [SWP] and -0.77 million acre feet Colorado River Aqueduct [CRA]).

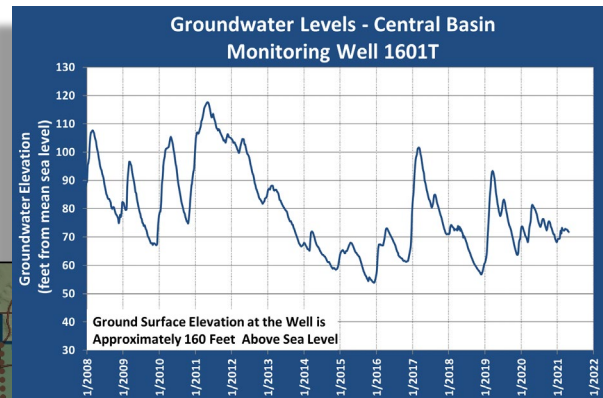
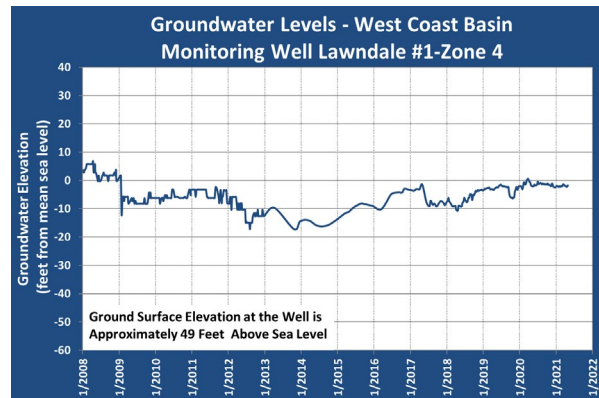


Did you know?

Of the total 349 billion gallons of freshwater the United States withdraws each day, groundwater is estimated to be 79.6 billion gallons, or 26 percent.

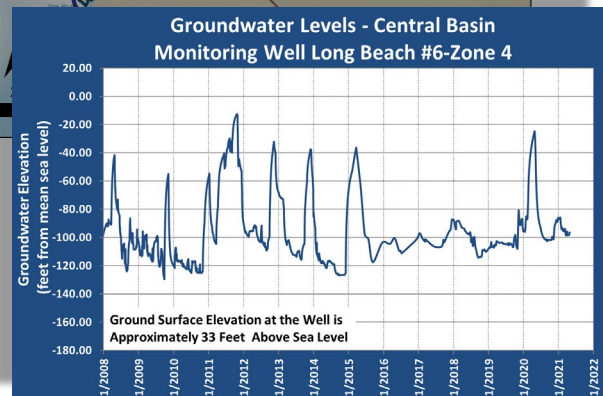
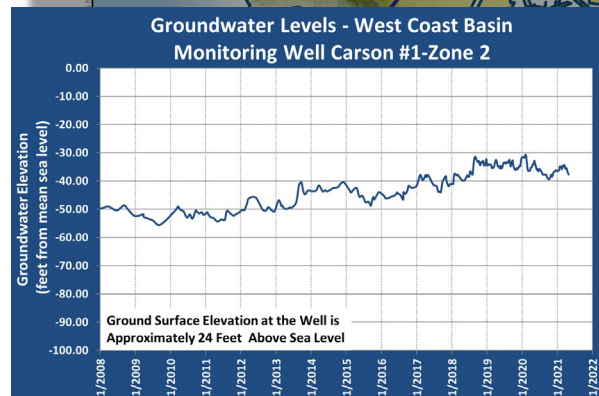
Groundwater Levels (through April 30, 2021)

Groundwater levels in key monitoring wells are shown in the hydrographs below.



Central Basin Key Well Long Beach #6 and West Coast Basin Key Wells Lawndale #1 & Carson #1 are in a confined aquifer and do not respond readily to rainfall but instead to changes in pumping

Central Basin Key Well 1601T is between the two spreading grounds and rises rapidly with rainfall and replenishment but falls sharply during dry spells and lack of replenishment.



Groundwater Level Changes in Key Wells

Well Name	Since Last Report	Since Same Time the Previous Year
Central Basin Key Well 1601T	Decreased 0.8 foot	Decreased 3.0 feet
Central Basin Key Well Long Beach #6 4	Decreased 0.5 foot	Decreased 71.4 feet
West Coast Basin Key Well Lawndale #1 4	Decreased 0.1 foot	Increased 0.2 foot
West Coast Basin Key Well Carson #1 2	Decreased 2.0 feet	Decreased 3.6 feet

Bold indicates a change in direction (decreasing or increasing) since the last report.

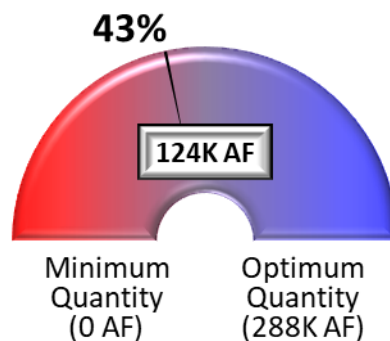
Optimum and Minimum Groundwater Quantity

In response to a 2002 State audit of the District's activities, the Board of Directors adopted an Optimum and Minimum Quantity for groundwater in the District to define an appropriate operating range that would sustain adjudicated pumping rights, leave room for future storage projects, and identify a lower limit. The amounts are based on the accumulated overdraft concept, which the District tracks year by year based on changes in groundwater storage.

After an extensive review of over 70 years of water level fluctuations and discussions with the Board and pumping community, Water Year 1999/2000 was recognized as a representative year for the Optimum Quantity, which equated to an accumulated overdraft of approximately 612,000 acre feet. The Minimum Quantity was defined as an accumulated overdraft of 900,000 acre feet, which allowed an operating range from 0 acre feet (minimum) to 288,000 acre feet (optimum). The Board also adopted a policy to make-up the groundwater deficit should the accumulated overdraft fall too far below the Optimum Quantity.

The Accumulated Overdraft as of April 30, 2021, has been estimated at 776,405 acre feet (subject to change), which is 123,595 acre feet above the Minimum Groundwater Quantity and 164,405 acre feet below the Optimum Quantity. The Basin is at 43% of Optimum Quantity which is 1% lower than what was reported last month (~3,000 AF lower).

GW Basin Operating Range



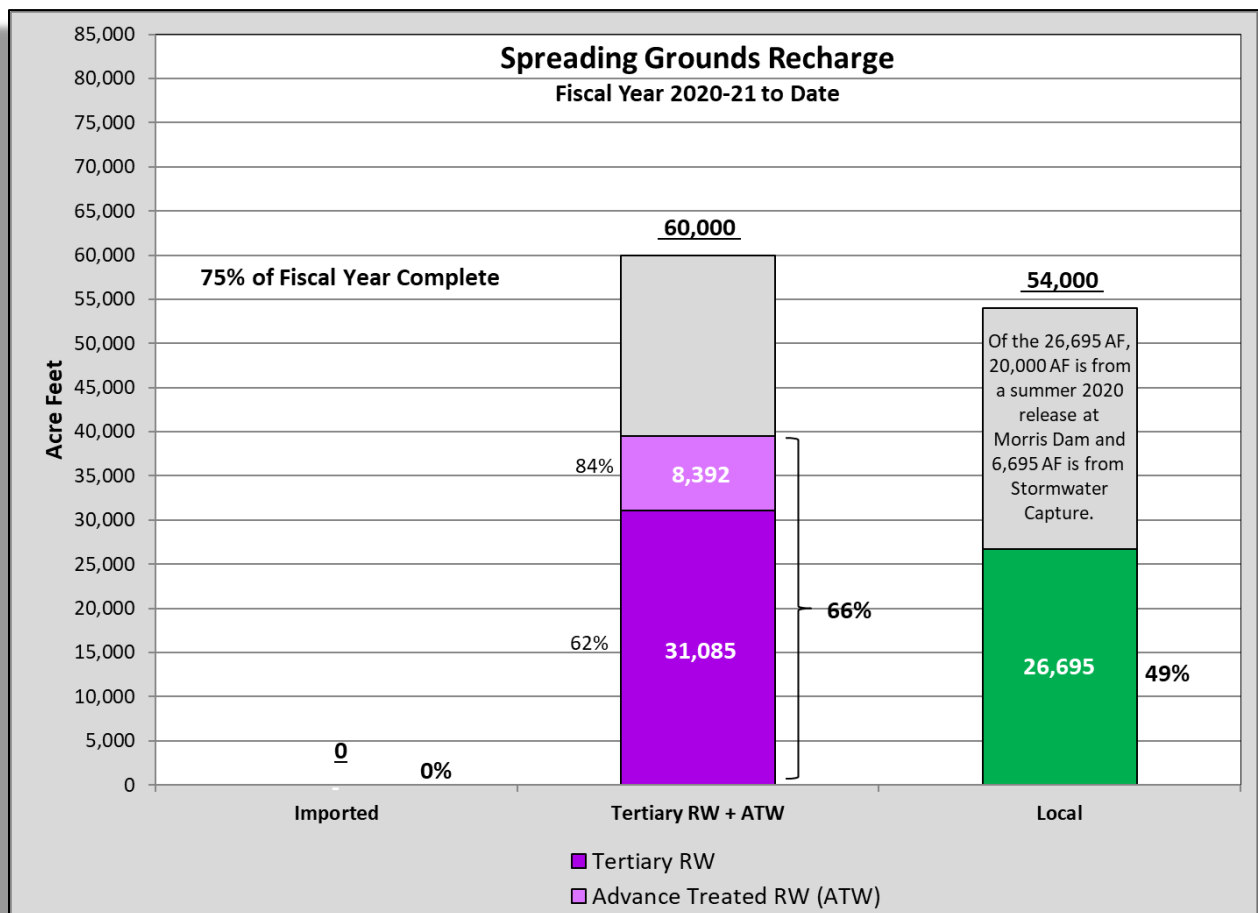
FACT:

National Ground Water Association (NGWA) has determined that 38 percent of the U.S. population depends on groundwater for its drinking water supply — be it from either a public source or private well.



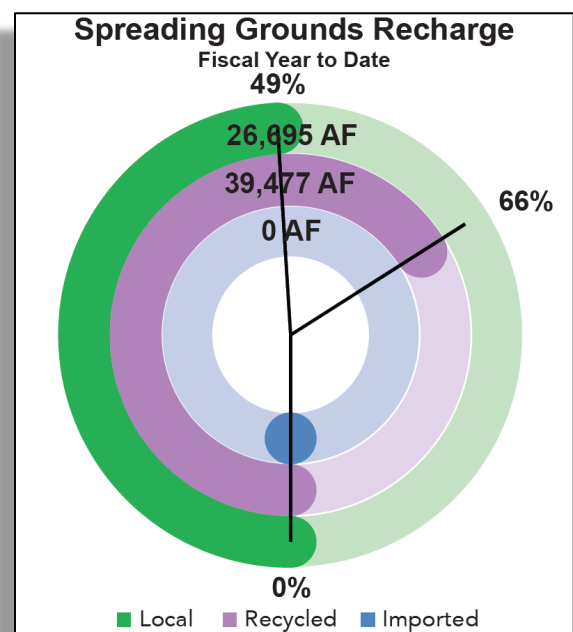
Montebello Forebay Spreading Grounds (March 2021)

The following Chart shows the preliminary spreading grounds replenishment water:

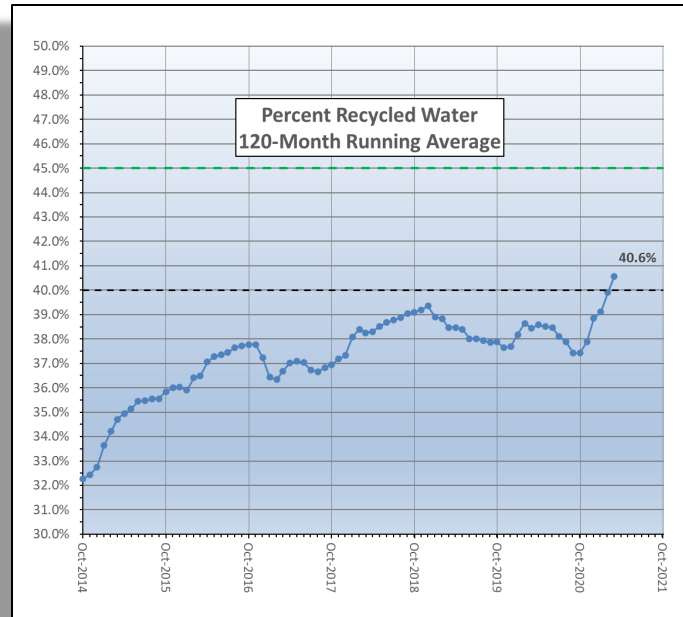


No imported water purchases are planned for Fiscal Year 2020-21.

Local water (stormwater plus dry weather urban runoff) is captured by the Los Angeles County Department of Public Works (LACDPW) at the spreading grounds for recharge. Local water amounts are determined as the sum of the total waters conserved at the spreading grounds less the imported and recycled water deliveries. For the 2020-21 Fiscal Year, approximately 26,695 acre feet of local water capture has been reported by the LACDPW as a result of summer releases from Morris Dam and precipitation in Water Year 2020-21.



Preliminary numbers for the 2020-21 Fiscal Year show that approximately 39,477 acre feet of recycled water has been recharged with 8,392 acre feet consisting of advanced treat water from the ARC AWTF and 31,085 acre feet of tertiary recycled water. Presuming the advanced treated water as “Null Water”, the 120-month running average of the recycled water contribution in the Montebello Forebay is 40.6% and the regulatory maximum is 45%, with additional monitoring being required once 40% is reached. WRD is currently working with LACSD to finalize the additional monitoring plan for submittal in May 2021.



Implementation of the plan will commence upon acceptance by the RWQCB.

Tertiary Recycle Water Permit Update

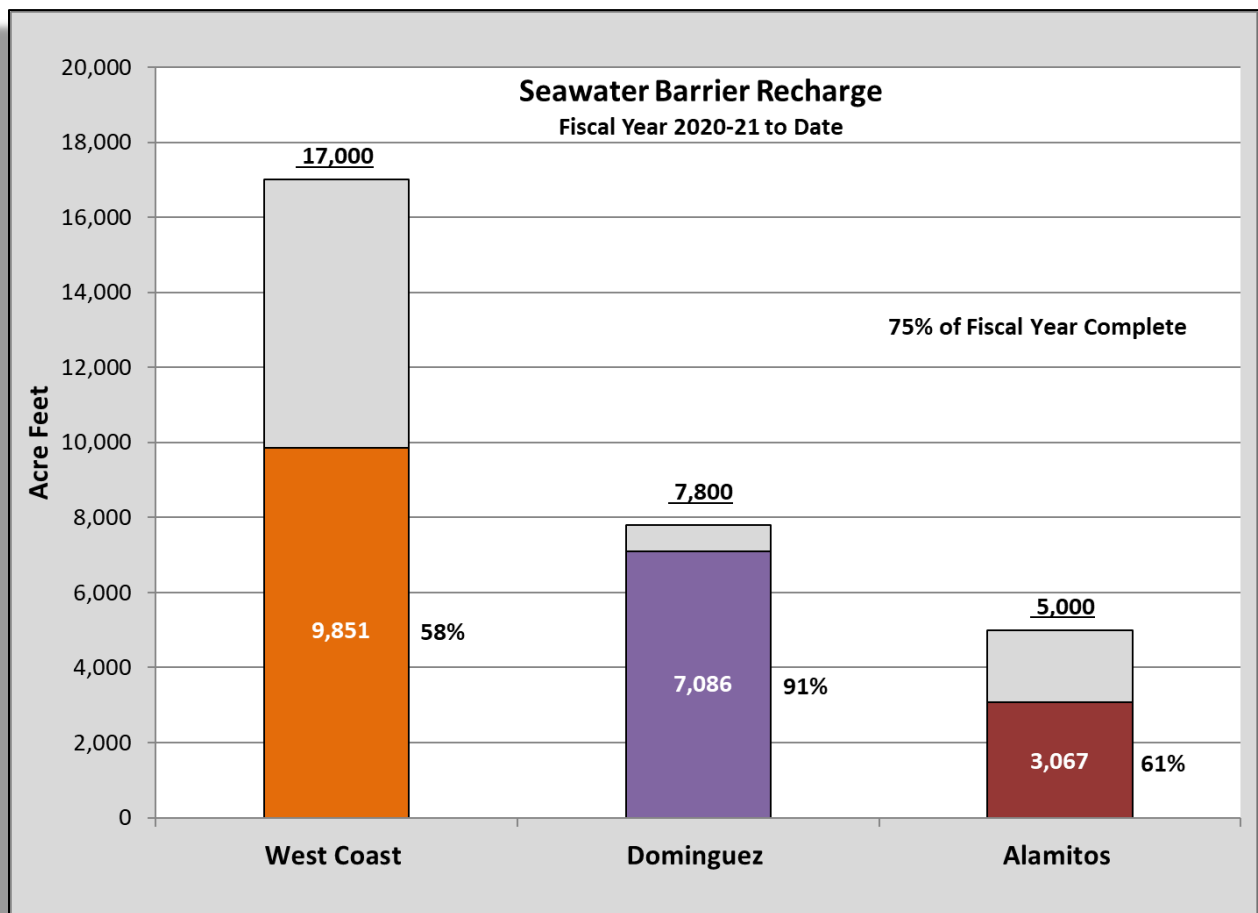
Following extensive collaboration between the District and LACSD, the Workplan required by the SWRCB - Division of Drinking Water (DDW) and LARWQCB regarding the use of tertiary treated recycled water at the Montebello Forebay Spreading Grounds was submitted on November 18, 2019.

Upon receipt of comments on the Workplan from the State of California, the District and LACSD will proceed with finalizing the preparation and submittal of the new Title 22 Engineering Report. In anticipation of receiving comments, staff continues to work collaboratively with the LACSD on developing the known components of the new Title 22 Engineering Report. A preliminary scoping meeting and a follow-up strategy meeting were held on November 26, 2019, and January 27, 2020, respectively. A follow-up meeting with the RWQCB to discuss some aspects of the Title 22 Engineering Report was held on December 8, 2020.

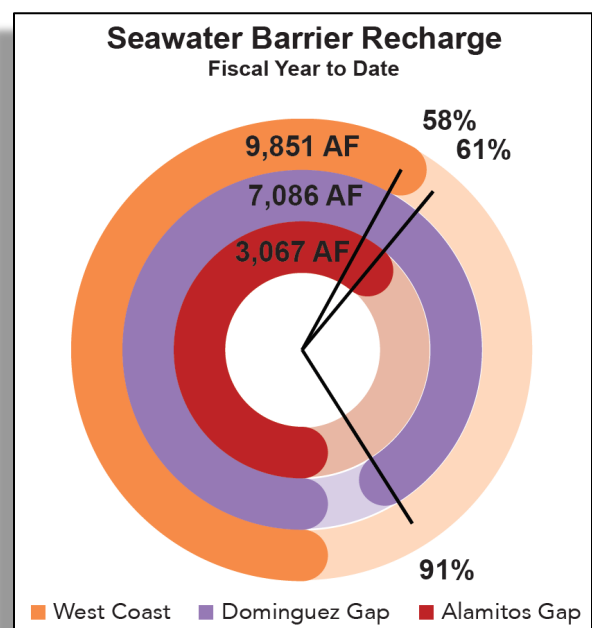
LACSD continues to work on two major studies needed for the new Title 22 Engineering Report – Biodegradable Dissolve Organic Carbon (BDOC) Study and Virus Logarithmic Reduction Value (LRV) Study. As the LACSD continues with the development of these studies they update the District during monthly project meetings. WRD staff and LACSD met with the LARWQCB and DDW on February 1, 2021, to discuss the BDOC Study. With the understanding that there is currently not an approved method for BDOC analysis, it was agreed WRD and LACSD will submit an enhanced monitoring plan in lieu of BDOC analysis once the recycled water contribution reaches 40%. LACSD is still working to schedule a separate meeting regarding the Virus LRV Study. The COVID pandemic has caused challenges with respect to performing the virus study and LACSD is reaching out to OCWD regarding the study they are considering.

Seawater Barrier Well Injection and Replenishment (March 2021)

The following Chart shows the barrier water injection:

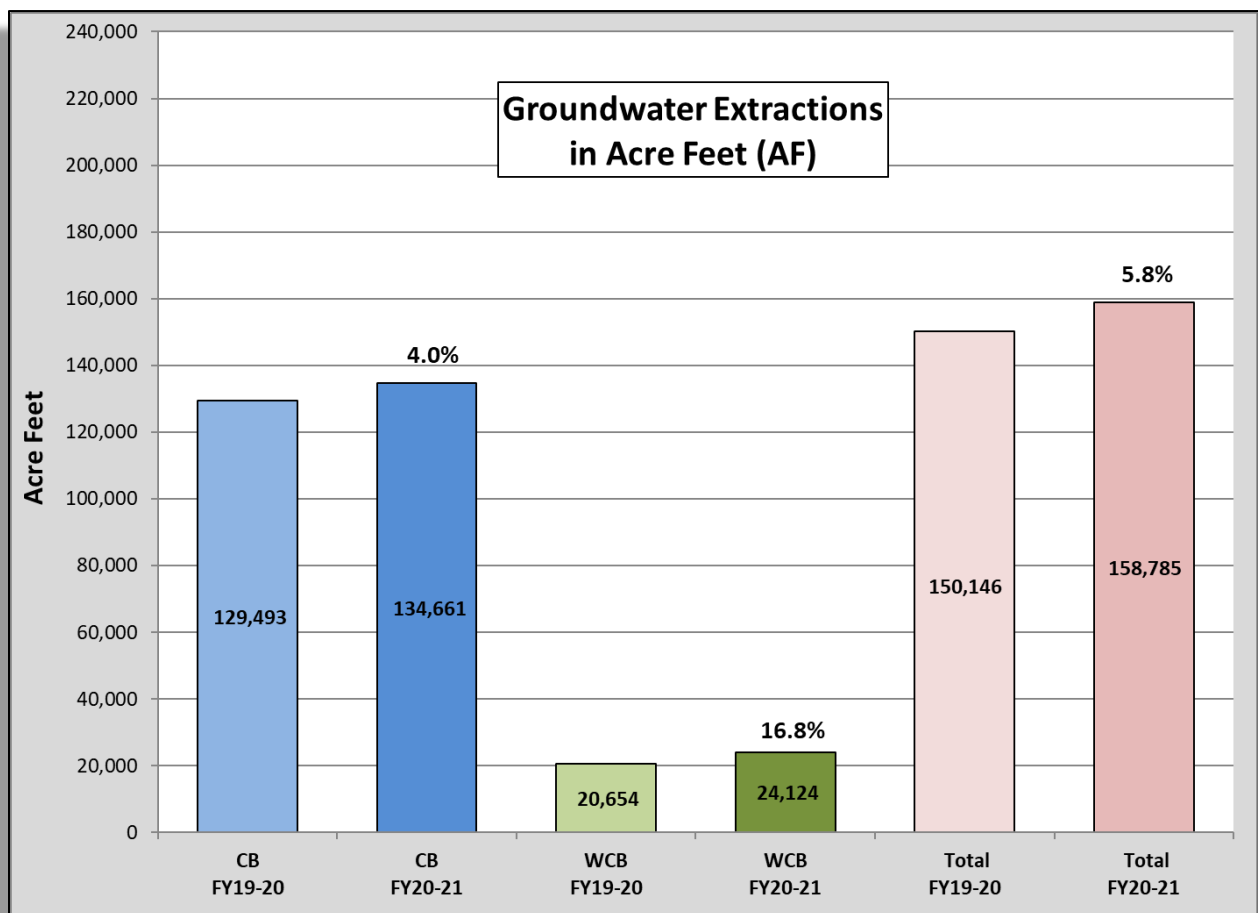


Preliminary numbers for the 2020-21 Fiscal Year show that the West Coast Barrier has used 9,851 acre feet of the total 17,000 acre feet planned for injection, 58% of total for the Fiscal Year. The Dominguez Gap Barrier used 7,086 acre feet of the total 7,800 acre feet planned for injection, 91% of the total for the Fiscal Year. The Alamitos Barrier, on the WRD side, used 3,067 acre feet of the total 5,000 acre feet planned for injection, 61% of the total for the Fiscal Year.



Assessable Pumping (Fiscal Year March 2021)

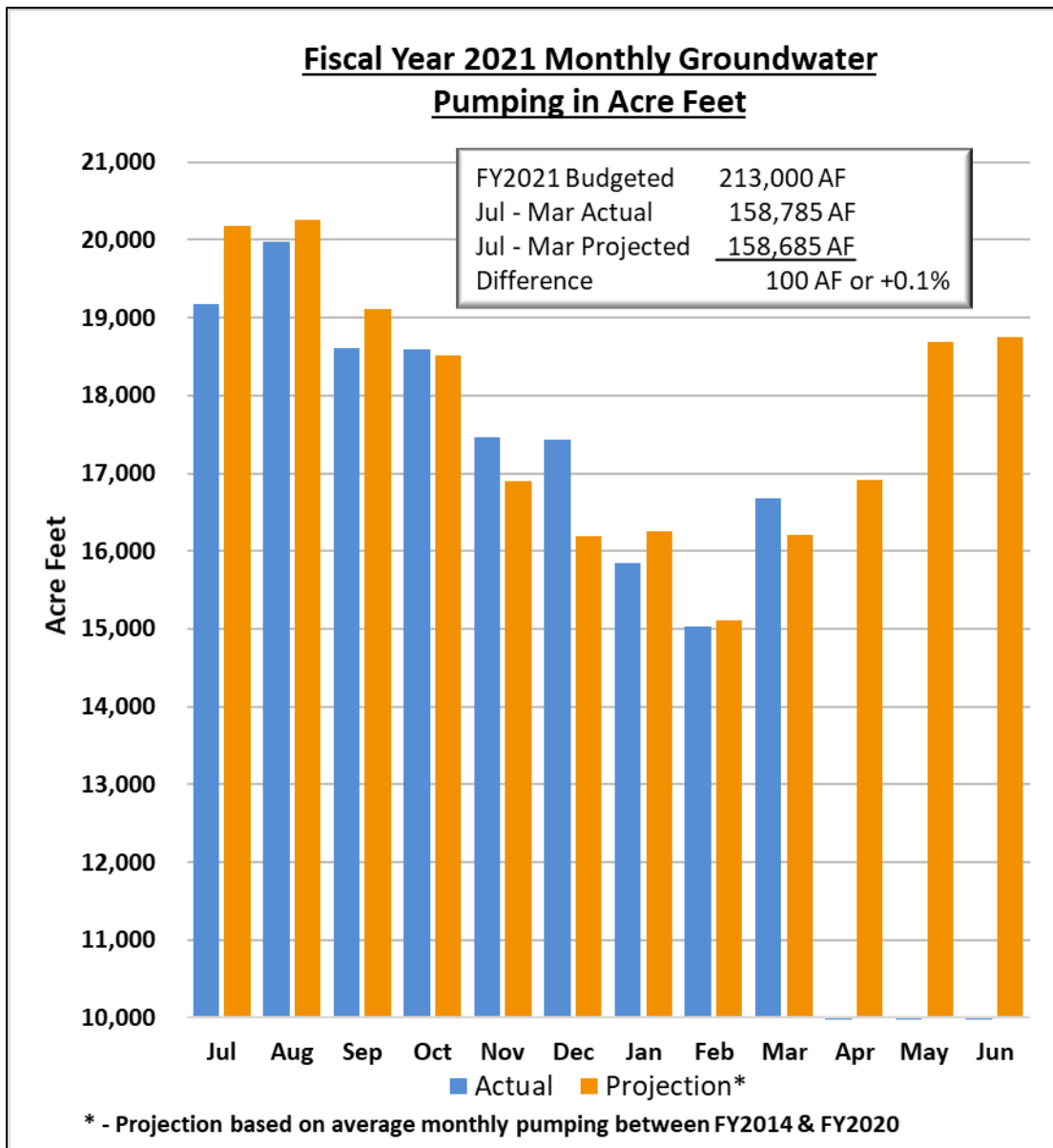
Preliminary numbers for groundwater production in the District for the Fiscal Year 2020-21 (March 2021) indicate pumping in the Central Basin was up 5,168.4 acre feet from the same time of the previous fiscal year (+4.0%) and the West Coast Basin pumping was 3,470 acre feet higher than the previous fiscal year (+16.8%). The total pumping is 158,785 acre feet compared to 150,146 acre feet during the same time the previous year for an increase of 8,638.4 acre feet, or +5.8%. The current pumping data do not include six (6) Central Basin pumpers and two (2) West Coast Basin pumpers who have not yet reported for an estimated 51 additional acre foot.



Interesting...

...of the total 349 billion gallons of freshwater the United States withdraws each day, groundwater is estimated to be 79.6 billion gallons, or 26 percent.

Preliminary numbers indicate 158,785 acre feet have been pumped this fiscal year and is 0.1% above the projected goal of 158,685 acre feet (or 100 acre feet). Monthly actual production versus 7-year average monthly production projections (FY 2014 through 2020) are included in the chart below.



"Healthy water is well water."

- Toni Szatkowski



For the Fiscal Year 2020-21 (July - March 2021), staff has tracked the production trends of the top five (5) producing pumpers and the bottom five (5) producing pumpers in each basin. These pumpers are identified in the following tables and are based on the change in volume (in acre feet) compared to the same time period for the previous Fiscal Year.

Production Trends - Central Basin				
Top 5 Producing <u>by Volume</u> (AF)	July – Mar. 2020	July – Mar. 2021	Difference	% Change
Long Beach, City of	19,134.37	23,893.84	4,759.47	24.87%
Los Angeles, City of Dept of Water and Power	6.74	1,296.44	1,289.70	19,135%
California Water Service Company (East LA)	7,136.59	7,868.78	732.19	10.26%
Golden State Water Company	14,956.32	15,669.76	713.44	4.77%
California American Water Company	827.94	1,477.07	649.13	78.40%
Bottom 5 Producing <u>by Volume</u> (AF)	July – Mar. 2020	July – Mar. 2021	Difference	% Change
Liberty Utilities Corporation	6,230.53	3,818.55	-2,411.98	-38.71%
Paramount, City of	4,209.14	2,466.58	-1,742.56	-41.40%
Santa Fe Springs, City of	2,124.01	1,252.28	-871.73	-41.04%
Commerce, City of	1,158.13	350.55	-807.58	-69.73%
San Gabriel Valley Water Company	695.07	39.70	-655.37	-94.29%

Production Trends – West Coast Basin				
Top 5 Producing <u>by Volume</u> (AF)	July – Mar. 2020	July – Mar. 2021	Difference	% Change
Tesoro Refining & Marketing Co., LLC	3,467.99	5,610.03	2,142.04	61.77%
Golden State Water Company	2,270.84	3,410.82	1,139.98	50.20%
Torrance, City of	2,857.77	3,911.11	1,053.34	36.86%
California Water Service Company	6.69	738.08	731.39	10,932%
West Basin Brewer Desalter	91.64	515.58	423.94	462.61%
Bottom 5 Producing <u>by Volume</u> (AF)	July – Mar. 2020	July – Mar. 2021	Difference	% Change
California Water Service Co. (Dominguez)	2,890.96	1,925.55	-965.41	-33.39%
Inglewood, City of	2,650.33	2,193.12	-457.21	-17.25%
Phillips 66 Company	3,949.76	3,531.30	-418.46	-10.59%
California Water Service Co./Hawthorne Lease	513.45	411.47	-101.98	-19.86%
Manhattan Beach, City of	142.76	49.23	-93.53	-65.52%

Water Replenishment District (WRD) publishes the Groundwater Basin Update (GWBU) monthly. All information contained herein is preliminary and is meant to be a snapshot the status of the basins at the time of publication and should not constitute an official WRD report. All the information presented in the GWBU utilizes the best available data at the time of publication. Data provided herein is a compilation of WRD data and publicly available information from several of our partners including, by not limited to, the Los Angeles County Department of Public Works - Stormwater Engineering Division, Metropolitan Water District of Southern California, California Department of Water Resources, US Bureau of Reclamation, University of Nebraska - Lincoln, and the US Department of Agriculture - Natural Resources Conservation Service. The GWBU is prepared by Senior Hydrogeologist, Everett Ferguson, who can be contacted directly with questions at eferguson@wrdd.org.

Appendix W

WRD Technical Bulletin on Climate Change Effects

WILL CLIMATE CHANGE AFFECT GROUNDWATER IN THE CENTRAL AND WEST COAST BASINS?

By: Ted Johnson, Chief Hydrogeologist

Email: tjohnson@wrdd.org

Introduction

The debate as to whether or not global climate change (a.k.a. global warming) is occurring appears to be over. The vast consensus of the scientific community agrees that the earth's temperatures are rising. It is well documented that global warming has been occurring for a long time, with one significant impact being the melting of glaciers all over the world (**Figure 1**).

periods) or warming (interglacial periods) naturally for reasons not completely understood. Sea levels rise and fall in response to massive ice sheets forming and melting over cycles of tens of thousands of years or more. Over the past 800,000 years, there have been 20 different glacial/interglacial periods defined resulting in sea level highs and lows (**Figure 2**).

During the chilly peak of the last ice age 18,000 to 20,000 years ago, geologic evidence indicates that the sea level was 400 feet lower than it is today (DWR, 2006). Since then, the earth has been warming, the ice has been melting, and sea levels have been rising at the rate of about 2 inches per century (DWR, 2006).

Until recently, another debate was whether or not climate change was being caused in part by human activities. However, as stated recently by the EPA (Ref. #4) and in a February 2007 report by the United Nations (Ref. #2), it is recognized that most of the warming in recent decades has probably been caused by human activities. Over the past 200 years since the industrial revolution, the burning of fossil fuels and deforestation have caused the concentrations of heat-trapping "greenhouse gases" (such as carbon dioxide, methane, and nitrous oxide) to increase significantly in our atmosphere, preventing heat from escaping to space, thus warming the earth somewhat like the glass panels of a greenhouse. This extra heating

has contributed to the normal heating cycle of the earth, and model predictions are for California to have temperature increases of 2.5 to 9 degrees Celsius by the year 2100 (DWR, 2006).

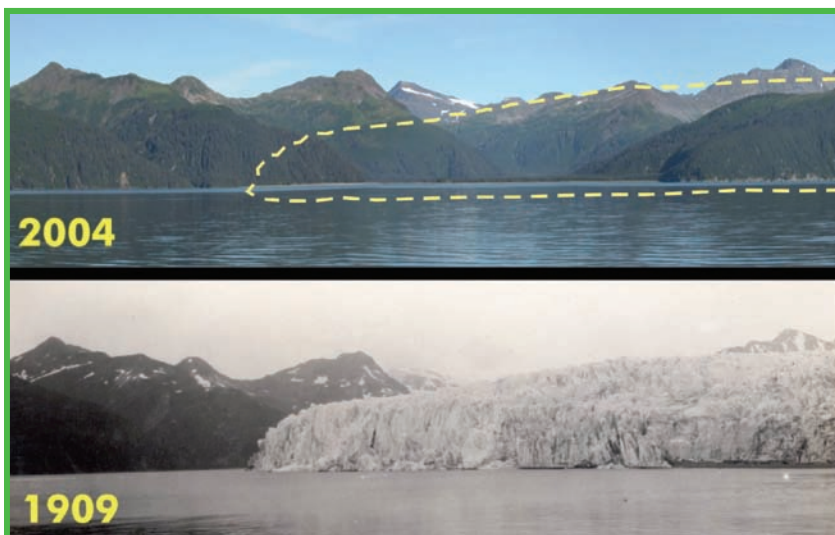


Figure 1—McCarty Glacier in Alaska. Evidence of global warming. Modified from Ref. #5

Even politicians are acknowledging this fact. California Governor Arnold Schwarzenegger said before the United Nations World Environment Day in June 2005,

"...California is going to be the leader in the fight against global warming...I say the debate is over.

We know the science. We see the threat. And we know the time for action is now."

(DWR, 2006). And, in his State of the Union address on January 23, 2007, President George W. Bush stated that technological breakthroughs will "...help us to confront the serious challenge of global climate change."

But, global warming shouldn't be a surprise. As a geologist, I was taught that the earth has never been at a constant temperature. It is either cooling (glacial

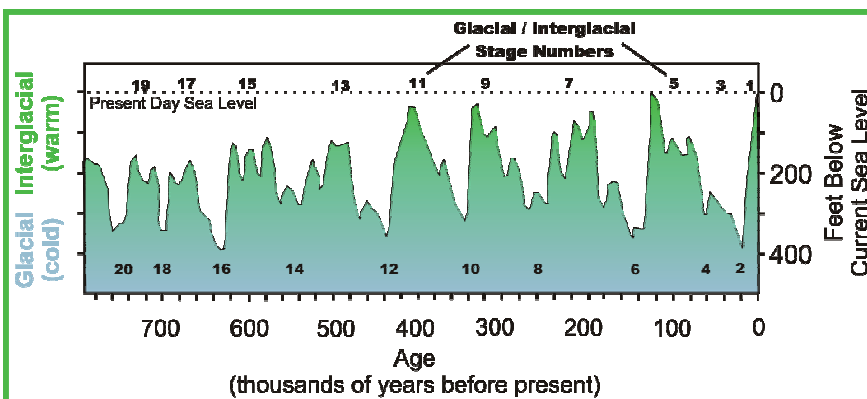


Figure 2—Global Changes in Sea Level over past 800,000 Years. Modified from Ref.#1

Impact on Groundwater Resources

A report by the DWR (2006) provides an excellent discussion on the potential impacts of warming on our state's water supply. **Table 1** is an excerpt from that report which lists the potential impacts and consequences of climate change.

But, will climate change affect the groundwater supplies in the Central and West Coast Basins, which provides about 40% of the total water demand for this area? Very simply, no one knows for sure, but close monitoring, planning, and responses to changes will likely be necessary. Warmer summers may cause drought, an increase in water demand, and a decrease in water supply. Warmer winters may result in precipitation falling as rain instead of snow, reducing the snow pack that is a natural reservoir for spring and summer snow melt, and may increase the intensity of storm runoff that may overflow stream channels, cause flooding, and cause more runoff losses to the oceans.

Northern California sea level rises may threaten the Bay Delta freshwater supplies, reducing our imported water availability in Southern California. And, sea level rises down here could threaten the Central and West Coast Basins with increased salt water intrusion.

So What Do We Do About It?

Water managers, water providers, and elected officials at the local, state, and federal level are working together towards solutions. Additional scientific information and modeling is needed to reduce the climate change uncertainties so that planning can be performed to implement the necessary projects to meet future water needs (Ref #3). The importance of maintaining and expanding the use of the Central and West Coast Basins as water supply reservoirs is crucial. New and improved spreading grounds and conservation pools will help capture as much storm water as possible to ensure a local supply of replenishment water. Finding ways to

decrease our reliance on imported water, increasing the use of recycled water, maximizing groundwater storage, conserving water, and protecting the basins from contamination due to salt water intrusion or other pollutants will ensure a reliable supply of locally-derived groundwater. As the groundwater steward for the Central and West Coast Basins, WRD is committed to working with others to find practical and optimum solutions to ensure the future reliability of the local groundwater supplies in the face of climate change.

Potential Water Resource Impact	Expected Consequence
Reduction of the State's average annual snowpack	<ul style="list-style-type: none"> Potential loss of 5 million acre-feet or more of average annual water storage in the State's snowpack Increased challenges for reservoir management and balancing the competing concerns of flood protection and water supply
Changes in the timing, intensity, location, amount, and variability of precipitation	<ul style="list-style-type: none"> Potential increased storm intensity and increased potential for flooding Possible increased potential for droughts
Long-term changes in watershed vegetation and increased incidence of wildfires	<ul style="list-style-type: none"> Changes in the intensity and timing of runoff Possible increased incidence of flooding and increased sedimentation
Sea level rise	<ul style="list-style-type: none"> Inundation of coastal marshes and estuaries Increased salinity intrusion into the Sacramento-San Joaquin River Delta Increased potential for Delta levee failure Increased potential for salinity intrusion into coastal aquifers (groundwater) Increased potential for flooding near the mouths of rivers due to backwater effects
Increased water temperatures	<ul style="list-style-type: none"> Possible critical effects on listed and endangered aquatic species Increased environmental water demand for temperature control Possible increased problems with foreign invasive species in aquatic ecosystems Potential adverse changes in water quality, including the reduction of dissolved oxygen levels
Changes in urban and agricultural water demand	Changes in demand patterns and evapotranspiration rates

Table 1—Potential Impacts to California's Water Supply due to Climate Change—Ref. #1

Reference Information used for this Technical Bulletin:

1. California Department of Water Resources, July 2006, Technical Memorandum Report, "Progress on Incorporating Climate Change into Management of California's Water Resources"
2. Intergovernmental Panel on Climate Change, February 2007, "Climate Change 2007: The Physical Science Basis—Summary for Policymakers"
3. Southwest Hydrology, January/February 2007, Volume 6/Number 1, published by NSF Center for Sustainability of semi-Arid Hydrology and Riparian Areas, University of Arizona.
4. USEPA web site (<http://www.epa.gov/climatechange/basicinfo.html>)
5. USGS photo library, Robert A. Rohde, and Global Warming Art (www.globalwarmingart.com).

