May 14, 2021

Job #: 2044225*00

FINAL APPENDICES
2020 Urban Water Management Plan
Palmdale Water District

PALMDALE WATER DISTRICT
A CENTURY OF SERVICE

Kennedy Jenks

Appendix A: UWMP Checklist

Appendix A:
UWMP Checklist

Checklist Arranged by Water Code.

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
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	Chapter 5	Section 3.1
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	Section 5.7.2	Section 3.1.1
10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.7	Section 3.1.2
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	Sections 5.2 and 5.5.7	Section 3.1.2; Appendix F Table 4-D, Appendix B, Table 7-5

Water Code Section	**Summary as Applies to UWMP**	**Subject**	**2020 Guidebook Location**	**2020 UWMP Location**
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Chapter 10	Appendix C
10608.4	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	Section 3.12
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	Section 2.1	Section 1.1
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	Section 2.5.2	Section 1.5
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	Section 7.4	Section 4.2.3.5
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.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	Appendix C

Water Code Section	**Summary as Applies to UWMP**	**Subject**	**2020 Guidebook Location**	**2020 UWMP Location**
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	Sections 10.3.1 and 10.4	Appendix C
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.	Summary	Chapter 1	Executive Summary
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	Section 1.6.1
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	Section 1.9
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	Section 1.7.1
10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.4	Section 1.7.1
10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	Section 1.7.2

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10631(a)	Describe the land uses within the service area.	System Description	Section 3.5	Section 1.8
10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.2.8	Section 4.1
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	Section 4.2.1
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.	System Supplies	Section 6.2	Section 4.6
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	Section 6.1	Section 4.2.3.4
10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.1	Section 4.3.2
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	Section 6.2.2	Section 4.2.1.3

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2.2	Section 4.2.1.1
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	Section 6.2.2	Section 4.2.1.3, Appendix G
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	Section 6.2.3	N/A
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	Section 6.2.4	Section 4.2.1.2
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	Section 6.2	Section 4.2.1.3
10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 6.7	Section 4.3.1
10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	Section 4.1, 4.2.1.2, 4.2.2.2, 4.2.3.1

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Section 4.3	Section 2.2.2
10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.2	Section 2.2.2
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	Sections 9.2 and 9.3	Section 8.2
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	Section 6.8	Section 7.6
10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	Section 4.3.3
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	Section 2.5.1	Appendix D
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	Section 2.5

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10631.2(a)	The UWMP must include energy intensity information as stated in the code.		Section 6.4 and Appendix O	Section 4.6
10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Chapter 8	Appendix I
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	Section 8.2	Appendix I
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	Section 8.2	Appendix I
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	Section 8.3	Appendix I
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	Section 8.3	Appendix I
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	Section 8.4	Appendix I

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Section 8.4	Appendix I
10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Section 8.4	Appendix I
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	Section 8.4	Appendix I
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	Section 8.4	Appendix I
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	Section 8.5	Appendix I
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	Section 8.5, 8.6	Appendix I
10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Section 8.7	Appendix I
10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Section 8.7	Appendix I

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
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	Section 8.7	Appendix I
10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Section 8.8	Appendix I
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	Section 8.8	Appendix I
10632(a)(8)(C)	Describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought.	Water Shortage Contingency Planning	Section 8.8	Appendix I
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	Section 8.9	Appendix I
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	Section 8.10	Appendix I
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	Section 8.11	Appendix I

Water Code Section	**Summary as Applies to UWMP**	**Subject**	**2020 Guidebook Location**	**2020 UWMP Location**
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)	Section 6.2	Section 5.3
10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2	Section 5.4
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)	Section 6.2	Section 5.5.2
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)	Section 6.2	Section 5.5, Table 6-4
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)	Section 6.2	Section 5.5.53
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2	Section 5.5.2
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	Chapter 7	Section 6.2, 6.3

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry 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	Section 7.3	Section 7.3, 7.4, 7.5
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	Section 7.3	Section 7.6
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	Section 7.3	Section 7.6.1
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	Section 7.3	Section 7.1.1, 7.1.2, 7.1.3
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	Section 7.3	Section 6.2.4
10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change condition, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 7.3	Section 7

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
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 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Sections 8.12, 10.4	Section 1.2.2
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	Section 2.6	Section 1.7.2
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.	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	Section 1.4.2
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	Section 10.2	Section 1.4.2
10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	Section 1.4.3
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.5	Section 1.4.4
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	Section 10.5	Section 1.4.4

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	Section 1.4.4
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	Section 10.5	Section 1.4.4
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	Section 10.5	Appendix C

Appendix B: Submittal Tables

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 *
Add additional rows as needed			
CA1910102	Palmdale Water District	26,869	20,511
	TOTAL	26,869	20,511

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

Submittal Table 2-2: Plan Identification

Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable* (select from drop down list)
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		

Submittal Table 2-3: Supplier Identification

Type of Supplier (select one or both)	
☐	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables are in calendar years
☐	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

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
Add additional rows as needed
NOTES: Not applicable. PWD does not receive water from a wholesale supplier. PWD is a direct contractor of the State Water Project.

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

Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	126,002	128,998	132,003	138,554	145,962	153,766

Submittal Table 4-1 Retail: Demands for Potable and Non-Potable[1] 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			11,757
Multi-Family			1,555
Commercial			1,190
Industrial			1,637
Institutional/Governmental			
Landscape			1,040
Sales/Transfers/Exchanges to other Suppliers			1,301
Losses			1,997
Other			34
		TOTAL	20,511

[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.*

Submittal Table 4-2 Retail: Use for Potable and Non-Potable[1] Water - Projected

Use Type	Additional Description (as needed)	Projected Water Use[2] *Report To the Extent that Records are Available*				
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		2025	2030	2035	2040	2045 (opt)
Add additional rows as needed						
Single Family		11,460	11,730	12,310	12,970	13,660
Multi-Family		1,450	1,480	1,560	1,640	1,730
Commercial	(a)	1,170	1,240	1,390	1,550	1,730
Industrial		1,350	1,390	1,480	1,590	1,700
Institutional/Governmental						
Landscape		1,050	1,130	1,300	1,490	1,690
Sales/Transfers/Exchanges to other Suppliers		1,300	1,300	1,300	1,300	1,300
Losses	(b)	1,900	2,000	2,100	2,200	2,400
Other	(c)	40	40	40	40	40
	TOTAL	19,720	20,310	21,480	22,780	24,250

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 *From Tables 4-1R and 4-2 R*	20,511	19,720	20,310	21,480	22,780	24,250
Recycled Water Demand[1] *From Table 6-4*	70	500	1,000	1,500	2,000	2,000
Optional Deduction of Recycled Water Put Into Long-Term Storage[2]						
TOTAL WATER USE	20,581	20,220	21,310	22,980	24,780	26,250

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]
01/2015	1297
01/2016	1559
01/2017	1808
01/2018	1723
01/2019	1351

[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.*

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) *Drop down list (y/n)*	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? *Drop down list (y/n)*	Yes

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	*SB X7-7 Table 1*	*SB X7-7 Table 1*	*SB X7-7 Table 5*	*SB X7-7 Table 7-F*
5 Year	*SB X7-7 Table 1*	*SB X7-7 Table 1*	*SB X7-7 Table 5*	

**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)*

Submittal Table 5-2: 2020 Compliance From SB X7-7 2020 Compliance Form

Retail Supplier or Regional Alliance Only

2020 GPCD			2020 Confirmed Target GPCD*	Did Supplier Achieve Targeted Reduction for 2020? Y/N
Actual 2020 GPCD*	2020 TOTAL Adjustments*	Adjusted 2020 GPCD* *(Adjusted if applicable)*		
SB X7-7 Table 9	*SB X7-7 Table 9*	*SB X7-7 Table 9*	*SB X7-7 Table 9*	*SB X7-7 Table 9*

**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)*

Submittal Table 6-1 Retail: Groundwater Volume Pumped

☐ Supplier does not pump groundwater.
The supplier will not complete the table below.

☐ 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	Antelope Valley Basin	8473	4355	6058	4425	7599
	TOTAL	8,473	4,355	6,058	4,425	7,599

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2020

☐	There is no wastewater collection system. The supplier will not complete the table below.
	Percentage of 2020 service area covered by wastewater collection system *(optional)*
	Percentage of 2020 service area population covered by wastewater collection system *(optional)*

Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? *Drop Down List*	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? *Drop Down List*	Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List*
Los Angeles County Sanitation Districts (LACSD)	Metered	12,140	LACSD District No. 20	Palmdale Water Reclamation Plant (WRP)	Yes	No
Total Wastewater Collected from Service Area in 2020:		12,140				

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

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

☐ **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 ***Drop down list***	Does This Plant Treat Wastewater Generated Outside the Service Area? ***Drop down list***	Treatment Level ***Drop down list***	**2020 volumes** [1]				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Palmdale Water Reclamation Plant		Agricultural irrigation of		Other	Yes	Tertiary	12,140	10,770	110		
							Total	12,140	10,770	110	0	0

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

☐ 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:	
Supplemental Water Added in 2020 (volume) *Include units*	
Source of 2020 Supplemental Water	

Beneficial Use Type *Insert additional rows if needed.*	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity) *Include volume units* [1]	General Description of 2020 Uses	Level of Treatment *Drop down list*	2020 [1]	2025 [1]	2030[1]	2035[1]	2040[1]	2045[1] (opt)
Agricultural irrigation										
Landscape irrigation (exc golf courses)					70					
Golf course irrigation										
Commercial use										
Industrial use										
Geothermal and other energy production										
Seawater intrusion barrier										
Recreational impoundment										
Wetlands or wildlife habitat										
Groundwater recharge (IPR)						500	1,000	1,500	2,000	2,000
Reservoir water augmentation (IPR)										
Direct potable reuse										
Other (Description Required)										
				Total:	70	500	1,000	1,500	2,000	2,000
				2020 Internal Reuse						

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

☐	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]
Insert additional rows as needed.		
Agricultural irrigation		
Landscape irrigation (exc golf courses)	1,000	70
Golf course irrigation		
Commercial use		
Industrial use		
Geothermal and other energy production		
Seawater intrusion barrier		
Recreational impoundment		
Wetlands or wildlife habitat		
Groundwater recharge (IPR)		
Reservoir water augmentation (IPR)		
Direct potable reuse		
Other (Description Required)		
Total	1,000	70

Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
☐	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use *
Add additional rows as needed			
Palmdale Regional Water Augmentation Project	The goal of the PRWAP is the beneficial use of 5,325 AFY of recycled water for either surface or groundwater augmentation to benefit the region. PRWAP is a solution that is drought resilient, provides local control of water resources, and helps meet future demands of PWD	2025	5,325
		Total	5,325
***Units of measure (AF, CCF, MG)** *must remain consistent throughout the UWMP as reported in Table 2-3.*			

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs

☐	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.					
☑	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.					
Page 4-14	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 *Drop Down List*	Expected Increase in Water Supply to Supplier* *This may be a range*
	Drop Down List (y/n)	*If Yes, Supplier Name*				
Add additional rows as needed						

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				
Groundwater (not desalinated)	Antelope Valley Basin	7,600	Drinking Water	
Groundwater (not desalinated)	Return Flow Credit	4,090	Drinking Water	
Groundwater (not desalinated)	Groundwater Banking	0	Drinking Water	
Surface water (not desalinated)	Littlerock Reservoir	4,540	Drinking Water	
Purchased or Imported Water	SWP Table A	5,695	Drinking Water	
Purchased or Imported Water	Butte Transfer Agreement	1,320	Drinking Water	
Recycled Water		70	Other Non-Potable Water	
	Total	23,315		0

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

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)	Antelope Valley Basin	4,220		2,770		2,770		2,770		2,770	
Groundwater (not desalinated)	Return Flow Credit	5,000		5,000		5,000		5,000		5,000	
Groundwater (not desalinated)	Groundwater or Surface Water Augmentation	5,325		5,325		5,325		5,325		5,325	
Surface water (not	Littlerock Reservoir	4,000		4,000		4,000		4,000		4,000	
Purchased or Imported Water	SWP table A	12,030		11,720		11,400		11,080		11,080	
Purchased or Imported Water	Butte Transfer Agreement	5,650		5,500		5,350		5,200		5,200	
Recycled Water	LACSD	500		1,000		1,500		2,000		2,000	
	Total	36,725	0	35,315	0	35,345	0	35,375	0	35,375	0

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

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**	
		☐	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ____________________________
		☑	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available *	**% of Average Supply**
Average Year	1922-2003	21300	100%
Single-Dry Year	1977	2130	10%
Consecutive Dry Years 1st Year	1988	2130	10%
Consecutive Dry Years 2nd Year	1989	8733	41%
Consecutive Dry Years 3rd Year	1990	2556	12%
Consecutive Dry Years 4th Year	1991	4260	20%
Consecutive Dry Years 5th Year	1992	3834	18%

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.*

Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison

	2025	2030	2035	2040	2045 *(Opt)*
Supply totals *(autofill from Table 6-9)*	36,725	35,315	35,345	35,375	35,375
Demand totals *(autofill from Table 4-3)*	20,220	21,310	22,980	24,780	26,250
Difference	16,505	14,005	12,365	10,595	9,125

Submittal Table 7-3 Retail: Single Dry Year Supply and Demand Comparison

	2025	2030	2035	2040	2045 (Opt)
Supply totals*	21,235	20,600	21,410	22,225	22,225
Demand totals*	20,220	21,310	22,980	24,780	26,250
Difference	1,015	(710)	(1,570)	(2,555)	(4,025)

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

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

		2025*	2030*	2035*	2040*	2045* (Opt)
First year	Supply totals	28,125	26,390	26,105	25,665	25,665
	Demand totals	20,220	21,310	22,980	24,780	26,250
	Difference	7,905	5,080	3,125	885	(585)
Second year	Supply totals	28,125	26,390	26,105	25,665	25,665
	Demand totals	20,220	21,310	22,980	24,780	26,250
	Difference	7,905	5,080	3,125	885	(585)
Third year	Supply totals	28,125	26,390	26,105	25,665	25,665
	Demand totals	20,220	21,310	22,980	24,780	26,250
	Difference	7,905	5,080	3,125	885	(585)
Fourth year	Supply totals	28,125	26,390	26,105	25,665	25,665
	Demand totals	20,220	21,310	22,980	24,780	26,250
	Difference	7,905	5,080	3,125	885	(585)
Fifth year	Supply totals	28,125	26,390	26,105	25,665	25,665
	Demand totals	20,220	21,310	22,980	24,780	26,250
	Difference	7,905	5,080	3,125	885	(585)

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

2021	Total
Total Water Use	19,410
Total Supplies	16,450
Surplus/Shortfall w/o WSCP Action	(2,960)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	4,270
Revised Surplus/(shortfall)	1,310
Resulting % Use Reduction from WSCP action	22%

2022	Total
Total Water Use	19,505
Total Supplies	26,155
Surplus/Shortfall w/o WSCP Action	6,650
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	6,650
Resulting % Use Reduction from WSCP action	0%

2023	Total
Total Water Use	19,620
Total Supplies	17,475
Surplus/Shortfall w/o WSCP Action	(2,145)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	4,316
Revised Surplus/(shortfall)	2,171
Resulting % Use Reduction from WSCP action	22%

2024	Total
Total Water Use	19,715
Total Supplies	19,980
Surplus/Shortfall w/o WSCP Action	265
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	265
Resulting % Use Reduction from WSCP action	0%

2025	Total
Total Water Use	20,220
Total Supplies	24,680
Surplus/Shortfall w/o WSCP Action	4,460
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	4,460
Resulting % Use Reduction from WSCP action	0%

Submittal Table 8-1
Water Shortage Contingency Plan Levels

Shortage Level	Percent Shortage Range	Shortage Response Actions *(Narrative description)*
1	Up to 10%	**Minor Shortage**. A threatened shortage exists and a voluntary consumer demand reduction, up to ten (10%) percent, is requested to make more efficient use of water and to appropriately respond to existing water conditions.
2	Up to 20%	**Moderate Shortage.** A shortage exists and a mandatory demand reduction, up to twenty (20%) percent, is requested to make more efficient use of water and to appropriately respond to existing water conditions.
3	Up to 30%	**Severe Shortage.** A severe shortage exists and a mandatory demand reduction, up to thirty (30%) percent, is requested to make more efficient use of water and to appropriately respond to existing water conditions.
4	Up to 40%	**Critical Shortage**. A critical shortage exists and a mandatory demand reduction, up to forty (40%) percent, is requested to make more efficient use of water and to appropriately respond to existing water conditions.
5	Up to 50%	**Emergency Shortage**. An emergency shortage exists and a mandatory reduction, up to fifty (50%) percent, is requested to make more efficient use of water and to appropriately respond to existing water conditions.
6	>50%	**Catastrophic Failure**. A water shortage emergency exists and a mandatory reduction in consumer demand of fifty or more (50%) is necessary to maintain sufficient water supplies for public health and safety.

Submittal Table 8-2: Demand Reduction Actions

Shortage Level	Demand Reduction Actions **_Drop down list_** _These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply._	How much is this going to reduce the shortage gap? _Include units used (volume type or percentage)_	Additional Explanation or Reference _(optional)_	Penalty, Charge, or Other Enforcement? **_For Retail Suppliers Only_** _Drop Down List_
Add additional rows as needed				
1	Expand Public Information Campaign	Up to 10%		No
1	Provide Rebates for Landscape Irrigation Efficiency	Up to 10%		No
2	Provide Rebates for Landscape Irrigation Efficiency	Up to 20%		No
2	Expand Public Information Campaign	Up to 20%		No
2	Implement or Modify Drought Rate Structure or Surcharge	Up to 20%		Yes
3	Expand Public Information Campaign	Up to 30%		No
3	Increase Frequency of Meter Reading	Up to 30%		Yes
3	Provide Rebates on Plumbing Fixtures and Devices	Up to 30%		No
3	Provide Rebates for Landscape Irrigation Efficiency	Up to 30%		No
3	Reduce System Water Loss	Up to 30%		No
3	Increase Water Waste Patrols	Up to 30%		Yes
3	Landscape - Restrict or prohibit runoff from landscape irrigation	Up to 30%		Yes
3	Implement or Modify Drought Rate Structure or Surcharge	Up to 30%		Yes
4	Expand Public Information Campaign	Up to 40%		No
4	Increase Frequency of Meter Reading	Up to 40%		Yes
4	Provide Rebates on Plumbing Fixtures and Devices	Up to 40%		No
4	Provide Rebates for Landscape Irrigation Efficiency	Up to 40%		No
4	Reduce System Water Loss	Up to 40%		No
4	Increase Water Waste Patrols	Up to 40%		Yes
4	Implement or Modify Drought Rate Structure or Surcharge	Up to 40%		Yes
5	Landscape - Restrict or prohibit runoff from landscape irrigation	Up to 50%		Yes
5	Expand Public Information Campaign	Up to 50%		No
5	Increase Frequency of Meter Reading	Up to 50%		Yes

5	Provide Rebates on Plumbing Fixtures and Devices	Up to 50%		No
5	Provide Rebates for Landscape Irrigation Efficiency	Up to 50%		No
5	Reduce System Water Loss	Up to 50%		No
5	Increase Water Waste Patrols	Up to 50%		Yes
5	Implement or Modify Drought Rate Structure or Surcharge	Up to 50%		Yes
6	Landscape - Restrict or prohibit runoff from landscape irrigation	Over 50%		Yes
6	Expand Public Information Campaign	Over 50%		No
6	Increase Frequency of Meter Reading	Over 50%		Yes
6	Provide Rebates on Plumbing Fixtures and Devices	Over 50%		No
6	Provide Rebates for Landscape Irrigation Efficiency	Over 50%		No
6	Reduce System Water Loss	Over 50%		No
6	Increase Water Waste Patrols	Over 50%		Yes
6	Implement or Modify Drought Rate Structure or Surcharge	Over 50%		Yes
6	Moratorium or Net Zero Demand Increase on New Connections	Over 50%		Yes

Submittal Table 8-3: Supply Augmentation and Other Actions

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
Add additional rows as needed			
4	Decrease Line Flushing	5	Decrease water distribution line flushing
5	New recycled water	4500	Expand recycled water Use
5	Transfers	9700	Activate local transfer agreements
4	Stored emergency supply	3000	Increase Lake Palmdale storage

Submittal Table 10-1 Retail: Notification to Cities and Counties

City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Palmdale	Yes	Yes
Lancaster	Yes	Yes
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Los Angeles County	Yes	Yes

Appendix C: Adoption of UWMP

Materials to be provided in Final Draft

Appendix D: Public Outreach Materials

PWD EST. 1918

PALMDALE WATER DISTRICT

A CENTURY OF SERVICE

October 1, 2020

City of Palmdale – Planning Division
38300 Sierra Hwy # A
Palmdale, CA 93550

Subject: 2020 Urban Water Management Plan for the Palmdale Water District

To Whom It May Concern:

The Palmdale Water District (PWD) is undertaking the review, update, and revision of its Urban Water Management Plan. PWD is located in Los Angeles County and serves the residents of the City of Palmdale. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an Urban Water Management Plan (UWMP) at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for PWD to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

The 2020 UWMP will include an update of anticipated water demands in the PWD service area. Concurrent with the UWMP update which will be adding a Seismic Risk Assessment section, PWD will also revise its Water Shortage Contingency Plan (WSCP) and create a new document for the WSCP. PWD is encouraging participation by land use agencies, water use agencies, and other interested parties in the UWMP and WSCP and would like to extend to your agency an opportunity to meet with us and review the various elements of the two documents including assumptions about future population, future water demand, future water supplies, and upcoming water conservation programs.

We anticipate that a draft UWMP and WSCP will be available for public review starting in March 2021. PWD will hold a public hearing in June 2021, prior to adoption of the UWMP and WSCP. Hence, we would like to solicit your input in the near future.

If your agency would like to learn more about the Urban Water Management Plan and Water Shortage Contingency Plan, please contact me at 661-456-1092 or cbolanos@palmdalewater.org no later than November 16, 2021.

Very truly yours,

Claudia Bolanos

Claudia Bolanos
Resource and Analytics Supervisor

661-947-4111 | 2029 East Avenue Q Palmdale, California 93550 | palmdalewater.org

PWD
EST. 1918

PALMDALE WATER DISTRICT

A CENTURY OF SERVICE

October 1, 2020

City of Lancaster – Planning Department
44933 Fern Avenue
Lancaster, CA 93534

Subject: 2020 Urban Water Management Plan for the Palmdale Water District

To Whom It May Concern:

The Palmdale Water District (PWD) is undertaking the review, update, and revision of its Urban Water Management Plan. PWD is located in Los Angeles County and serves the residents of the City of Palmdale. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an Urban Water Management Plan (UWMP) at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for PWD to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

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Very truly yours,

Claudia Bolanos

Claudia Bolanos
Resource and Analytics Supervisor

PWD
EST. 1918

PALMDALE WATER DISTRICT
A CENTURY OF SERVICE

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ACWA
PROUD MEMBER

October 1, 2020

Los Angeles County Department of Regional Planning
320 W Temple Street
Los Angeles, CA 90012

Subject: 2020 Urban Water Management Plan for the Palmdale Water District

To Whom It May Concern:

The Palmdale Water District (PWD) is undertaking the review, update, and revision of its Urban Water Management Plan. PWD is located in Los Angeles County and serves the residents of the City of Palmdale. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an Urban Water Management Plan (UWMP) at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for PWD to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

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661-947-4111 | 2029 East Avenue Q Palmdale, California 93550 | palmdalewater.org

PWD EST. 1918

PALMDALE WATER DISTRICT

A CENTURY OF SERVICE

October 1, 2020

Littlerock Creek Irrigation District
Attn. James Chaisson
35141 87th St E
Littlerock, CA 93543

Subject: 2020 Urban Water Management Plan for the Palmdale Water District

To Whom It May Concern:

The Palmdale Water District (PWD) is undertaking the review, update, and revision of its Urban Water Management Plan. PWD is located in Los Angeles County and serves the residents of the City of Palmdale. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an Urban Water Management Plan (UWMP) at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for PWD to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

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Very truly yours,

Claudia Bolanos

Claudia Bolanos
Resource and Analytics Supervisor

EST. 1918

PALMDALE WATER DISTRICT

A CENTURY OF SERVICE

October 1, 2020

Los Angeles County Sanitation District No. 20
1955 Workman Mill Road
Whittier, CA 90601

Subject: 2020 Urban Water Management Plan for the Palmdale Water District

To Whom It May Concern:

The Palmdale Water District (PWD) is undertaking the review, update, and revision of its Urban Water Management Plan. PWD is located in Los Angeles County and serves the residents of the City of Palmdale. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an Urban Water Management Plan (UWMP) at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for PWD to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

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Very truly yours,

Claudia Bolanos

Claudia Bolanos
Resource and Analytics Supervisor

PALMDALE WATER DISTRICT

A CENTURY OF SERVICE

October 1, 2020

Antelope Valley-East Kern Water Agency
Attn. Dwayne Chisam
6500 W Avenue N
Palmdale, CA 93551

Subject: 2020 Urban Water Management Plan for the Palmdale Water District

To Whom It May Concern:

The Palmdale Water District (PWD) is undertaking the review, update, and revision of its Urban Water Management Plan. PWD is located in Los Angeles County and serves the residents of the City of Palmdale. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an Urban Water Management Plan (UWMP) at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for PWD to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

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If your agency would like to learn more about the Urban Water Management Plan and Water Shortage Contingency Plan, please contact me at 661-456-1092 or cbolanos@palmdalewater.org no later than November 16, 2021.

Very truly yours,

Claudia Bolanos

Claudia Bolanos
Resource and Analytics Supervisor

PALMDALE WATER DISTRICT
A CENTURY OF SERVICE

October 1, 2020

Quartz Hill Water District
Attn. Chad Reed
5034 W. Avenue L
Quartz Hill, CA 93536

Subject: 2020 Urban Water Management Plan for the Palmdale Water District

To Whom It May Concern:

The Palmdale Water District (PWD) is undertaking the review, update, and revision of its Urban Water Management Plan. PWD is located in Los Angeles County and serves the residents of the City of Palmdale. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an Urban Water Management Plan (UWMP) at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for PWD to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

The 2020 UWMP will include an update of anticipated water demands in the PWD service area. Concurrent with the UWMP update which will be adding a Seismic Risk Assessment section, PWD will also revise its Water Shortage Contingency Plan (WSCP) and create a new document for the WSCP. PWD is encouraging participation by land use agencies, water use agencies, and other interested parties in the UWMP and WSCP and would like to extend to your agency an opportunity to meet with us and review the various elements of the two documents including assumptions about future population, future water demand, future water supplies, and upcoming water conservation programs.

We anticipate that a draft UWMP and WSCP will be available for public review starting in March 2021. PWD will hold a public hearing in June 2021, prior to adoption of the UWMP and WSCP. Hence, we would like to solicit your input in the near future.

If your agency would like to learn more about the Urban Water Management Plan and Water Shortage Contingency Plan, please contact me at 661-456-1092 or cbolanos@palmdalewater.org no later than November 16, 2021.

Very truly yours,

Claudia Bolanos

Claudia Bolanos
Resource and Analytics Supervisor

PALMDALE WATER DISTRICT
A CENTURY OF SERVICE

October 1, 2020

Rosamond Community Services District
Attn. Steve Perez
3179 35th Street West
Rosamond, CA 93560

Subject: 2020 Urban Water Management Plan for the Palmdale Water District

To Whom It May Concern:

The Palmdale Water District (PWD) is undertaking the review, update, and revision of its Urban Water Management Plan. PWD is located in Los Angeles County and serves the residents of the City of Palmdale. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an Urban Water Management Plan (UWMP) at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for PWD to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

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Very truly yours,

Claudia Bolanos

Claudia Bolanos
Resource and Analytics Supervisor

PALMDALE WATER DISTRICT
A CENTURY OF SERVICE

October 1, 2020

Los Angeles County Farm Bureau
Attn. Richard Miner
41228 12th Street West, Suite A
Palmdale, CA 93551

Subject: 2020 Urban Water Management Plan for the Palmdale Water District

To Whom It May Concern:

The Palmdale Water District (PWD) is undertaking the review, update, and revision of its Urban Water Management Plan. PWD is located in Los Angeles County and serves the residents of the City of Palmdale. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an Urban Water Management Plan (UWMP) at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for PWD to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

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Very truly yours,

Claudia Bolanos

Claudia Bolanos
Resource and Analytics Supervisor

EST. 1918

PALMDALE WATER DISTRICT

A CENTURY OF SERVICE

October 1, 2020

Los Angeles World Airports
Airport Environmental Manager
7301 World Way West, 3rd Floor
Los Angeles, CA 90045

Subject: 2020 Urban Water Management Plan for the Palmdale Water District

To Whom It May Concern:

The Palmdale Water District (PWD) is undertaking the review, update, and revision of its Urban Water Management Plan. PWD is located in Los Angeles County and serves the residents of the City of Palmdale. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an Urban Water Management Plan (UWMP) at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for PWD to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

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Very truly yours,

Claudia Bolanos

Claudia Bolanos
Resource and Analytics Supervisor

PWD EST. 1918

PALMDALE WATER DISTRICT

A CENTURY OF SERVICE

October 1, 2020

Los Angeles County Waterworks District 40
900 S. Fremont St.
Alhambra, CA 91803

Subject: 2020 Urban Water Management Plan for the Palmdale Water District

To Whom It May Concern:

The Palmdale Water District (PWD) is undertaking the review, update, and revision of its Urban Water Management Plan. PWD is located in Los Angeles County and serves the residents of the City of Palmdale. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an Urban Water Management Plan (UWMP) at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for PWD to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

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Very truly yours,

Claudia Bolanos

Claudia Bolanos
Resource and Analytics Supervisor

More outreach materials to be provided in Final Draft

Appendix E: Water Systems Audit Output

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

?	Click to access definition
+	Click to add a comment

Water Audit Report for: Palmdale Water District
Reporting Year: 2015 | 1/2015 - 12/2015

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 data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

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.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<----------- Enter grading in column 'E' and 'J' ---------->

									Pcnt:		Value:	
Volume from own sources:	+	?	9	17,014.560	acre-ft/yr	+	?	10	-1.00%	● ○		acre-ft/yr
Water imported:	+	?	n/a	0.000	acre-ft/yr	+	?			● ○		acre-ft/yr
Water exported:	+	?	8	433.490	acre-ft/yr	+	?	10	-1.00%	● ○		acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 16,748.556 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

						Pcnt:		Value:	
Billed metered:	+	?	9	15,078.000	acre-ft/yr				
Billed unmetered:	+	?	n/a	0.000	acre-ft/yr				
Unbilled metered:	+	?	10	19.830	acre-ft/yr				
Unbilled unmetered:	+	?	4	353.290	acre-ft/yr		○ ●	353.290	acre-ft/yr

Unbilled Unmetered volume entered is greater than the recommended default value

AUTHORIZED CONSUMPTION: ? 15,451.120 acre-ft/yr

Use buttons to select percentage of water supplied
OR
value

WATER LOSSES (Water Supplied - Authorized Consumption) 1,297.436 acre-ft/yr

Apparent Losses

						Pcnt:		Value:	
Unauthorized consumption:	+	?		41.871	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+	?	7	308.119	acre-ft/yr	2.00%	● ○		acre-ft/yr
Systematic data handling errors:	+	?		37.695	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? 387.685 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 909.750 acre-ft/yr

WATER LOSSES: 1,297.436 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 1,670.556 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+	?	9	433.0	miles
Number of active AND inactive service connections:	+	?	10	27,481	
Service connection density:		?		63	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: + ? (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: + ? 9 80.0 psi

COST DATA

Total annual cost of operating water system:	+	?	10	$32,560,448	$/Year
Customer retail unit cost (applied to Apparent Losses):	+	?	5	$3.26	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+	?	5	$108.26	$/acre-ft

☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 79 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: Customer retail unit cost (applied to Apparent Losses)

2: Variable production cost (applied to Real Losses)

3: Volume from own sources

AWWA Free Water Audit Software:
Reporting Worksheet

? Click to access definition
\+ Click to add a comment

Water Audit Report for: Palmdale Water District
Reporting Year: 2016 1/2016 - 12/2016

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 data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

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.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<----------- Enter grading in column 'E' and 'J' ---------->

									Pcnt:		Value:	
Volume from own sources:	+	?	5	17,367.3	acre-ft/yr	+	?	8		○ ●	-430.269	acre-ft/yr
Water imported:	+	?	n/a	0.000	acre-ft/yr	+	?			● ○		acre-ft/yr
Water exported:	+	?	3	641.060	acre-ft/yr	+	?	4		● ○		acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 17,156.510 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

						Pcnt:		Value:	
Billed metered:	+	?	7	15,204.000	acre-ft/yr				
Billed unmetered:	+	?	n/a	0.000	acre-ft/yr				
Unbilled metered:	+	?	9	27.390	acre-ft/yr				
Unbilled unmetered:	+	?	10	366.120	acre-ft/yr		○ ●	366.120	acre-ft/yr

Unbilled Unmetered volume entered is greater than the recommended default value

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: ? 15,597.510 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 1,559.000 acre-ft/yr

Apparent Losses

						Pcnt:		Value:	
Unauthorized consumption:	+	?		42.891	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+	?	5	333.080	acre-ft/yr	2.14%	● ○		acre-ft/yr
Systematic data handling errors:	+	?		38.010	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? 413.981 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 1,145.019 acre-ft/yr

WATER LOSSES: 1,559.000 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 1,952.510 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+	?	9	433.0	miles
Number of active AND inactive service connections:	+	?	7	27,420	
Service connection density:		?		63	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: + ? (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	+	?	9	71.2	psi

COST DATA

Total annual cost of operating water system:	+	?	10	$34,383,009	$/Year
Customer retail unit cost (applied to Apparent Losses):	+	?	9	$1.22	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+	?	5	$267.56	$/acre-ft

☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 65 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: Variable production cost (applied to Real Losses)

AWWA Free Water Audit Software:

System Attributes and Performance Indicators

WAS v5.0

Water Audit Report for: Palmdale Water District
Reporting Year: 2017 | 1/2017 - 12/2017

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 74 out of 100 ***

System Attributes:

	Apparent Losses:	493.065	acre-ft/yr
+	Real Losses:	1,315.194	acre-ft/yr
=	Water Losses:	1,808.259	acre-ft/yr
?	Unavoidable Annual Real Losses (UARL):	593.94	acre-ft/yr
	Annual cost of Apparent Losses:	$285,993	
	Annual cost of Real Losses:	$382,419	Valued at **Variable Production Cost**

Return to Reporting Worksheet to change this assumpiton

Performance Indicators:

Financial:	Non-revenue water as percent by volume of Water Supplied:	10.5%	
	Non-revenue water as percent by cost of operating system:	1.9%	Real Losses valued at Variable Production Cost
Operational Efficiency:	Apparent Losses per service connection per day:	16.04	gallons/connection/day
	Real Losses per service connection per day:	42.79	gallons/connection/day
	Real Losses per length of main per day*:	N/A	
	Real Losses per service connection per day per psi pressure:	0.52	gallons/connection/day/psi

From Above, Real Losses = Current Annual Real Losses (CARL):	1,315.19	acre-feet/year
? Infrastructure Leakage Index (ILI) [CARL/UARL]:	2.21	

* 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:
Reporting Worksheet

WAS v5.0

?	Click to access definition
+	Click to add a comment

Water Audit Report for: Palmdale Water District
Reporting Year: 2018 | 1/2018 - 12/2018

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 data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

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.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<----------- Enter grading in column 'E' and 'J' ---------->

							Pcnt:		Value:	
Volume from own sources:	+ ?	7	19,886.5	acre-ft/yr	+ ?	8		○ ●	-389.628	acre-ft/yr
Water imported:	+ ?	n/a	0.000	acre-ft/yr	+ ?			● ○		acre-ft/yr
Water exported:	+ ?	3	1,317.140	acre-ft/yr	+ ?	4		● ○		acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED:	**18,959.018**	acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

					Pcnt:		Value:	
Billed metered:	+ ?	8	16,671.000	acre-ft/yr				
Billed unmetered:	+ ?	n/a	0.000	acre-ft/yr				
Unbilled metered:	+ ?	10	527.190	acre-ft/yr				
Unbilled unmetered:	+ ?	7	38.310	acre-ft/yr		○ ●	38.310	acre-ft/yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION:	?	**17,236.500**	acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)	**1,722.518**	acre-ft/yr

Apparent Losses

					Pcnt:		Value:	
Unauthorized consumption:	+ ?		47.398	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+ ?	8	-27.473	acre-ft/yr	-0.16%	● ○		acre-ft/yr
Systematic data handling errors:	+ ?		41.678	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses:	?	**61.602**	acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses:	?	**1,660.916**	acre-ft/yr
WATER LOSSES:		**1,722.518**	acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER:	?	**2,288.018**	acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+ ?	9	433.0	miles
Number of active AND inactive service connections:	+ ?	7	27,458	
Service connection density:	?		63	conn./mile main

Are customer meters typically located at the curbstop or property line?		Yes
Average length of customer service line:	+ ?	

(length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	+ ?	9	78.2	psi

COST DATA

Total annual cost of operating water system:	+ ?	10	$36,916,891	$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ?	9	$1.37	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+ ?	5	$277.61	$/acre-ft

☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 74 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: Variable production cost (applied to Real Losses)

3: Unauthorized consumption

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: Palmdale Water District (1910102)
Reporting Year: 2019 1/2019 - 12/2019

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 data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

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Master Meter and Supply Error Adjustments

WATER SUPPLIED

<----------- Enter grading in column 'E' and 'J' ---------->

						Pcnt:		Value:	
Volume from own sources:	+ ?	7	18,534.091	acre-ft/yr	+ ?	8		○ ●	-221.434	acre-ft/yr
Water imported:	+ ?	n/a	0.000	acre-ft/yr	+ ?			● ○		acre-ft/yr
Water exported:	+ ?	3	1,174.620	acre-ft/yr	+ ?	4		● ○		acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: **17,580.905** acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option

Billed metered:	+ ?	8	15,853.000	acre-ft/yr			
Billed unmetered:	+ ?	n/a	0.000	acre-ft/yr			
Unbilled metered:	+ ?	10	337.980	acre-ft/yr	Pcnt:		Value:
Unbilled unmetered:	+ ?	7	38.660	acre-ft/yr		○ ●	38.660 acre-ft/yr

Use buttons to select percentage of water supplied
OR
value

AUTHORIZED CONSUMPTION: ? **16,229.640** acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) **1,351.265** acre-ft/yr

Apparent Losses

					Pcnt:		Value:	
Unauthorized consumption:	+ ?		43.952	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+ ?	8	-27.478	acre-ft/yr	-0.17%	● ○		acre-ft/yr
Systematic data handling errors:	+ ?	7	39.633	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? **56.107** acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? **1,295.158** acre-ft/yr

WATER LOSSES: **1,351.265** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? **1,727.905** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+ ?	9	433.0	miles
Number of active AND inactive service connections:	+ ?	7	27,454	
Service connection density:	?		63	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: + ? (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: + ? 9 74.8 psi

COST DATA

Total annual cost of operating water system:	+ ?	10	$36,692,915	$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ?	9	$1.37	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+ ?	5	$277.03	$/acre-ft ☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 74 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: Variable production cost (applied to Real Losses)
3: Unauthorized consumption

Appendix F: SBX7-7 & DWR Population Tool

SB X7-7 Table 0: Units of Measure Used in UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent with Submittal Table 2-3*
NOTES:

SB X7-7 Table-1: Baseline Period Ranges

Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	25,339	Acre Feet
	2008 total volume of delivered recycled water		Acre Feet
	2008 recycled water as a percent of total deliveries	0%	**See Note 1**
	Number of years in baseline period[1, 2]	10	Years
	Year beginning baseline period range	1995	
	Year ending baseline period range[3]	2004	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	
	Year ending baseline period range[4]	2007	

[1] *If the 2008 recycled water delivery is less than 10 percent of total water deliveries, then the 10-15year baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater of total deliveries, the 10-15 year baseline period is a continuous 10- to 15-year period.*

SB X7-7 Table 2: Method for Population Estimates

Method Used to Determine 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: Service Area Population

Year		Population
10 to 15 Year Baseline Population		
Year 1	1995	79,578
Year 2	1996	88,785
Year 3	1997	89,675
Year 4	1998	90,540
Year 5	1999	91,375
Year 6	2000	92,172
Year 7	2001	98,516
Year 8	2002	99,649
Year 9	2003	100,788
Year 10	2004	104,237
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2003	100,788
Year 2	2004	104,237
Year 3	2005	104,120
Year 4	2006	105,754
Year 5	2007	107,396

NOTES:

SB X7-7 Table 4: Annual Gross Water Use *

Baseline Year *Fm SB X7-7 Table 3*		Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	Deductions					Acre Feet
			Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	Annual Gross Water Use
10 to 15 Year Baseline - Gross Water Use								
Year 1	1995	22,233			-		-	22,233
Year 2	1996	23,514			-		-	23,514
Year 3	1997	23,152			-		-	23,152
Year 4	1998	20,626			-		-	20,626
Year 5	1999	23,398			-		-	23,398
Year 6	2000	25,901			-		-	25,901
Year 7	2001	25,220			-		-	25,220
Year 8	2002	25,670			-		-	25,670
Year 9	2003	24,909			-		-	24,909
Year 10	2004	26,684			-		-	26,684
Year 11	0	-			-		-	-
Year 12	0	-			-		-	-
Year 13	0	-			-		-	-
Year 14	0	-			-		-	-
Year 15	0	-			-		-	-
10 - 15 year baseline average gross water use								**24,131**
5 Year Baseline - Gross Water Use								
Year 1	2003	24,909			-		-	24,909
Year 2	2004	26,684			-		-	26,684
Year 3	2005	26,128			-		-	26,128
Year 4	2006	27,934			-		-	27,934
Year 5	2007	28,152			-		-	28,152
5 year baseline average gross water use								**26,761**

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

Complete one table for each source.

Name of Source	Enter Name of Source 1

This water source is:

☐ The supplier's own water source

☐ A purchased or imported source

Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System[1]	Meter Error Adjustment [2] *Optional* *(+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1995	22,233		22,233
Year 2	1996	23,514		23,514
Year 3	1997	23,152		23,152
Year 4	1998	20,626		20,626
Year 5	1999	23,398		23,398
Year 6	2000	25,901		25,901
Year 7	2001	25,220		25,220
Year 8	2002	25,670		25,670
Year 9	2003	24,909		24,909
Year 10	2004	26,684		26,684
Year 11	0			-
Year 12	0			-
Year 13	0			-
Year 14	0			-
Year 15	0			-
5 Year Baseline - Water into Distribution System				
Year 1	2003	24,909		24,909
Year 2	2004	26,684		26,684
Year 3	2005	26,128		26,128
Year 4	2006	27,934		27,934
Year 5	2007	28,152		28,152

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

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

SB X7-7 Table 4-C.1: Process Water Deduction Eligibility

Criteria 1

Industrial water use is equal to or greater than 12% of gross water use

Baseline Year *Fm SB X7-7 Table 3*		Gross Water Use Without Process Water Deduction	Industrial Water Use *	Percent Industrial Water	**Eligible for Exclusion Y/N**
10 to 15 Year Baseline - Process Water Deduction Eligibility					
Year 1	1995	22,233		0%	NO
Year 2	1996	23,514		0%	NO
Year 3	1997	23,152		0%	NO
Year 4	1998	20,626		0%	NO
Year 5	1999	23,398		0%	NO
Year 6	2000	25,901		0%	NO
Year 7	2001	25,220		0%	NO
Year 8	2002	25,670		0%	NO
Year 9	2003	24,909		0%	NO
Year 10	2004	26,684		0%	NO
Year 11	0	-			NO
Year 12	0	-			NO
Year 13	0	-			NO
Year 14	0	-			NO
Year 15	0	-			NO
5 Year Baseline - Process Water Deduction Eligibility					
Year 1	2003	24,909		0%	NO
Year 2	2004	26,684		0%	NO
Year 3	2005	26,128		0%	NO
Year 4	2006	27,934		0%	NO
Year 5	2007	28,152		0%	NO

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

SB X7-7 Table 4-C.2: Process Water Deduction Eligibility

Criteria 2

Industrial water use is equal to or greater than 15 GPCD

Baseline Year *Fm SB X7-7 Table 3*		Industrial Water Use *	Population	Industrial GPCD	**Eligible for Exclusion Y/N**
10 to 15 Year Baseline - Process Water Deduction Eligibility					
Year 1	1995		79,578	-	NO
Year 2	1996		88,785	-	NO
Year 3	1997		89,675	-	NO
Year 4	1998		90,540	-	NO
Year 5	1999		91,375	-	NO
Year 6	2000		92,172	-	NO
Year 7	2001		98,516	-	NO
Year 8	2002		99,649	-	NO
Year 9	2003		100,788	-	NO
Year 10	2004		104,237	-	NO
Year 11	0		-		NO
Year 12	0		-		NO
Year 13	0		-		NO
Year 14	0		-		NO
Year 15	0		-		NO
5 Year Baseline - Process Water Deduction Eligibility					
Year 1	2003		100,788	-	NO
Year 2	2004		104,237	-	NO
Year 3	2005		104,120	-	NO
Year 4	2006		105,754	-	NO
Year 5	2007		107,396	-	NO

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

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

Criteria 3

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

Baseline Year *Fm SB X7-7 Table 3*		Gross Water Use Without Process Water Deduction *Fm SB X7-7 Table 4*	Industrial Water Use *	Non-industrial Water Use	Population *Fm SB X7-7 Table 3*	Non-Industrial GPCD	**Eligible for Exclusion Y/N**
10 to 15 Year Baseline - Process Water Deduction Eligibility							
Year 1	1995	22,233		22,233	79,578	249	NO
Year 2	1996	23,514		23,514	88,785	236	NO
Year 3	1997	23,152		23,152	89,675	230	NO
Year 4	1998	20,626		20,626	90,540	203	NO
Year 5	1999	23,398		23,398	91,375	229	NO
Year 6	2000	25,901		25,901	92,172	251	NO
Year 7	2001	25,220		25,220	98,516	229	NO
Year 8	2002	25,670		25,670	99,649	230	NO
Year 9	2003	24,909		24,909	100,788	221	NO
Year 10	2004	26,684		26,684	104,237	229	NO
Year 11	0	-		-	-		NO
Year 12	0	-		-	-		NO
Year 13	0	-		-	-		NO
Year 14	0	-		-	-		NO
Year 15	0	-		-	-		NO
5 Year Baseline - Process Water Deduction Eligibility							
Year 1	2003	24,909		24,909	100,788	221	NO
Year 2	2004	26,684		26,684	104,237	229	NO
Year 3	2005	26,128		26,128	104,120	224	NO
Year 4	2006	27,934		27,934	105,754	236	NO
Year 5	2007	28,152		28,152	107,396	234	NO

SB X7-7 Table 5: Baseline Gallons Per Capita Per Day (GPCD)

Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1995	79,578	22,233	249
Year 2	1996	88,785	23,514	236
Year 3	1997	89,675	23,152	230
Year 4	1998	90,540	20,626	203
Year 5	1999	91,375	23,398	229
Year 6	2000	92,172	25,901	251
Year 7	2001	98,516	25,220	229
Year 8	2002	99,649	25,670	230
Year 9	2003	100,788	24,909	221
Year 10	2004	104,237	26,684	229
Year 11	0	-	-	
Year 12	0	-	-	
Year 13	0	-	-	
Year 14	0	-	-	
Year 15	0	-	-	
10-15 Year Average Baseline GPCD				**231**

5 Year Baseline GPCD

Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2003	100,788	24,909	221
Year 2	2004	104,237	26,684	229
Year 3	2005	104,120	26,128	224
Year 4	2006	105,754	27,934	236
Year 5	2007	107,396	28,152	234
5 Year Average Baseline GPCD				**229**

SB X7-7 Table 6: Baseline GPCD *From Table SB X7-7 Table 5*	*Summary*
10-15 Year Baseline GPCD	231
5 Year Baseline GPCD	229

NOTES:

SB X7-7 Table 7: 2020 Target Method

Select Only One

Target Method		Supporting Tables
☑	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator *Located in the WUE Data Portal at wuedata.water.ca.gov* Resources *button*

SB X7-7 Table 7-A: Target Method 1
20% Reduction

10-15 Year Baseline GPCD	**2020 Target GPCD**
231	**185**

NOTES:

SB X7-7 Table 7-C: Target Method 2

Target CII Water Use

Baseline Year *Fm SB X7-7 Table 3*		**CII Water Use** [1,2]	**Process Water Exclusion** (Optional) *Fm SB X7-7 Table 4*	**CII Water Use Minus Process Water**	**Population** *Fm SB X7-7 Table 3*	**CII GPCD**
Unit of Measure						**Acre Feet**
Year 1	1995		0	0	79,578	0
Year 2	1996		0	0	88,785	0
Year 3	1997		0	0	89,675	0
Year 4	1998		0	0	90,540	0
Year 5	1999		0	0	91,375	0
Year 6	2000		0	0	92,172	0
Year 7	2001		0	0	98,516	0
Year 8	2002		0	0	99,649	0
Year 9	2003		0	0	100,788	0
Year 10	2004		0	0	104,237	0
Year 11	0		0	0	-	
Year 12	0		0	0	-	
Year 13	0		0	0	-	
Year 14	0		0	0	-	
Year 15	0		0	0	-	
Average Annual 10 to 15 Year Baseline CII Water Use (GPCD)						0
10% Reduction						0.0
2020 Target CII Water Use						**0**

[1] *CII water use for each year of the baseline period must be provided by the user.*

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

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target

5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	**Calculated 2020 Target** [2]			**Confirmed 2020 Target**[4]
		As calculated by supplier in this SB X7-7 Verification Form	**Special Situations**[3]		
			Prorated 2020 Target	Population Weighted Average 2020 Target	
229	217				**217**

[1] ***Maximum 2020 Target*** *is 95% of the 5 Year Baseline GPCD except for suppliers at or below 100 GPCD.*

[2] ***Calculated 2020 Target*** *is the target calculated by the Supplier based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target. Supplier may only enter one calculated target.*

[3] ***Prorated targets and population weighted target*** *are allowed for special situations only. These situations are described in Appendix P, Section P.3*

[4] ***Confirmed Target*** *is the lesser of the Calculated 2020 Target (C5, D5, or E5) or the Maximum 2020 Target (Cell B5)*

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	126,002

NOTES:

SB X7-7 Table 4: 2020 Gross Water Use

Compliance Year 2020	**2020 Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**2020 Deductions**					**2020 Gross Water Use**
		Exported Water *	**Change in Dist. System Storage*** (+/-)	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use***	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	
	23,245			-		-	**23,245**

*** 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.

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 SWP Water - Table A Amounts

This water source is *(check one)* **:**

☐ The supplier's own water source

☑ A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional* *(+/-)*	Corrected Volume Entering Distribution System
	5,695	-	5,695

[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 SWP Water - Butte Transfer Agreement

This water source is *(check one)* **:**

☐ The supplier's own water source

☑ A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional* *(+/-)*	Corrected Volume Entering Distribution System
	1,320		1,320

[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 Littlerock Dam Reservoir - Surface Water

This water source is *(check one)* **:**

☑ The supplier's own water source

☐ A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional* *(+/-)*	Corrected Volume Entering Distribution System
	4,540		4,540

*[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 Return Flows

This water source is *(check one)* **:**

☑ The supplier's own water source

☐ A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional* *(+/-)*	Corrected Volume Entering Distribution System
	4,090		4,090

*[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 - Antelope Valley Basin

This water source is *(check one)* **:**

☑ The supplier's own water source

☐ A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional* *(+/-)*	Corrected Volume Entering Distribution System
	7,600		7,600

[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-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**
	23,245		0%	NO

NOTES:

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**
		126,002	-	NO

NOTES:

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 *Fm SB X7-7 Table 4*	2020 Industrial Water Use	2020 Non-industrial Water Use	2020 Population *Fm SB X7-7 Table 3*	Non-Industrial GPCD	**Eligible for Exclusion Y/N**
	23,245		23,245	126,002	165	NO

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] *(Adjusted if applicable)*		
	Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]				
165	-	-	-	-	165		**NO**

[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:

WUEdata - Palmdale Water District

Sign Out

Please print this page to a PDF and include as part of your UWMP submittal.

Confirmation Information

Generated By	Water Supplier Name	Confirmation #	Generated On
Lauren Everett	Palmdale Water District	6940412223	1/29/2021 1:14:15 PM

Boundary Information

Census Year	Boundary Filename	Internal Boundary ID
1990	PWD_Boundary_1990.kml	462
2000	PWD_Boundary_2000.kml	463
2010	PWD_Boundary_2010.kml	464
1990	PWD_Boundary_1990.kml	462
2000	PWD_Boundary_2000.kml	463
2010	PWD_Boundary_2010.kml	464
1990	PWD_Boundary_1990.kml	462
2000	PWD_Boundary_2000.kml	463
2010	PWD_Boundary_2010.kml	464
1990	PWD_Boundary_1990.kml	462
2000	PWD_Boundary_2000.kml	463
2010	PWD_Boundary_2010.kml	464
1990	PWD_Boundary_1990.kml	462
2000	PWD_Boundary_2000.kml	463
2010	PWD_Boundary_2010.kml	464
1990	PWD_Boundary_1990.kml	462
2000	PWD_Boundary_2000.kml	463
2010	PWD_Boundary_2010.kml	464
1990	PWD_Boundary_1990.kml	462
2000	PWD_Boundary_2000.kml	463
2010	PWD_Boundary_2010.kml	464

Baseline Period Ranges

10 to 15-year baseline period

Number of years in baseline period:	10
Year beginning baseline period range:	1995
Year ending baseline period range[1]:	2004

5-year baseline period

Year beginning baseline period range:	2003
Year ending baseline period range[2]:	2007

[1] The ending year must be between December 31, 2004 and December 31, 2010.

[2] The ending year must be between December 31, 2007 and December 31, 2010.

Persons per Connection

Year	Census Block Level Total Population	Number of Connections *	Persons per Connection
1990	66,477	19619	3.39
1991	-	-	3.46
1992	-	-	3.53
1993	-	-	3.60
1994	-	-	3.67
1995	-	-	3.74
1996	-	-	3.80
1997	-	-	3.87
1998	-	-	3.94
1999	-	-	4.01
2000	92,172	22595	4.08
2001	-	-	4.11
2002	-	-	4.13
2003	-	-	4.16
2004	-	-	4.18
2005	-	-	4.21

2006	-	-	4.23
2007	-	-	4.25
2008	-	-	4.28
2009	-	-	4.30
2010	112,468	25959	4.33
2011	-	-	4.36
2012	-	-	4.38
2013	-	-	4.41
2014	-	-	4.43
2015	-	-	4.46
2020	-	-	4.59 **

Population Using Persons-Per-Connection

Year		Number of Connections *	Persons per Connection	Total Population
10 to 15 Year Baseline Population Calculations				
Year 1	1995	21306	3.74	79,578
Year 2	1996	23340	3.80	88,785
Year 3	1997	23154	3.87	89,675
Year 4	1998	22968	3.94	90,540
Year 5	1999	22781	4.01	91,375
Year 6	2000	22595	4.08	92,172
Year 7	2001	23999	4.11	98,516
Year 8	2002	24128	4.13	99,649
Year 9	2003	24257	4.16	100,788
Year 10	2004	24937	4.18	104,237
5 Year Baseline Population Calculations				
Year 1	2003	24257	4.16	100,788
Year 2	2004	24937	4.18	104,237
Year 3	2005	24761	4.21	104,120
Year 4	2006	25001	4.23	105,754
Year 5	2007	25240	4.25	107,396
2020 Compliance Year Population Calculations				
2020		27479	4.59 **	126,062

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Appendix G: Groundwater Adjudication Court Order

SUPERIOR COURT OF THE STATE OF CALIFORNIA

COUNTY OF LOS ANGELES – CENTRAL DISTRICT

ANTELOPE VALLEY GROUNDWATER CASES

Included Actions:
Los Angeles County Waterworks District No. 40 v. Diamond Farming Co., Superior Court of California, County of Los Angeles, Case No. BC 325201;

Los Angeles County Waterworks District No. 40 v. Diamond Farming Co., Superior Court of California, County of Kern, Case No. S-1500-CV-254-348;

Wm. Bolthouse Farms, Inc. v. City of Lancaster, Diamond Farming Co. v. City of Lancaster, Diamond Farming Co. v. Palmdale Water Dist., Superior Court of California, County of Riverside, Case Nos. RIC 353 840, RIC 344 436, RIC 344 668

RICHARD WOOD, on behalf of himself and all other similarly situated v. A.V. Materials, Inc., et al., Superior Court of California, County of Los Angeles, Case No. BC509546

Judicial Council Coordination Proceeding No. 4408

CLASS ACTION

Santa Clara Case No. 1-05-CV-049053
Assigned to the Honorable Jack Komar

(~~PROPOSED~~) JUDGMENT

The matter came on for trial in multiple phases. A large number of parties representing the majority of groundwater production in the Antelope Valley Area of Adjudication ("Basin") entered into a written stipulation to resolve their claims and requested that the Court enter their [Proposed] Judgment and Physical Solution as part of the final judgment. As to all remaining parties, including those who failed to answer or otherwise appear, the Court heard the testimony of witnesses, considered the evidence, and heard the arguments of counsel. Good cause appearing, the Court finds and orders judgment as follows:

1. The Second Amended Stipulation For Entry of Judgment and Physical Solution among the stated stipulating parties is accepted and approved by the Court.

2. Consistent with the December 23 2015 Statement of Decision ("Decision"), the Court adopts the Proposed Judgment and Physical Solution attached hereto as Exhibit A and incorporated herein by reference, as the Court's own physical solution ("Physical Solution"). The Physical Solution is binding upon all parties.

3. In addition to the terms and provisions of the Physical Solution the Court finds as follows:

    a. Each of the Stipulating Parties to the Physical Solution has the right to pump groundwater from the Antelope Valley Adjudication Area as stated in the Decision and Physical Solution.

    b. The following entities are awarded prescriptive rights from the native safe yield against the Tapia Parties, defaulted parties identified in Exhibit 1 to the Physical Solution, and parties who did not appear at trial identified in Exhibit B attached hereto, in the following amounts:

Los Angeles County Waterworks District No. 40	17,659.07 AFY
Palmdale Water District	8,297.91 AFY
Littlerock Creek Irrigation District	1,760 AFY
Quartz Hill Water District	1,413 AFY
Rosamond Community Services District	1,461.7 AFY
Palm Ranch Irrigation District	960 AFY

Desert Lake Community Services District	318 AFY
California Water Service Company	655 AFY
North Edwards Water District	111.67 AFY

No other parties are subject to these prescriptive rights.

c. Each of the parties referred to in the Decision as Supporting Landowner Parties has the right to pump groundwater from the Antelope Valley Adjudication Area as stated in the Decision and in Paragraph 5.1.10 of the Physical Solution in the following amounts:

i.	Desert Breeze MHP, LLC	18.1 AFY
ii.	Milana VII, LLC dba Rosamond Mobile Home Park	21.7 AFY
iii.	Reesdale Mutual Water Company	23 AFY
iv.	Juanita Eyherabide, Eyherabide Land Co., LLC and Eyherabide Sheep Company, collectively	12 AFY
v.	Clan Keith Real Estate Investments, LLC., dba Leisure Lake Mobile Estates	64 AFY
vi.	White Fence Farms Mutual Water Co. No. 3	4 AFY
vii.	LV Ritter Ranch LLC	0 AFY
viii.	Robar Enterprises, Inc., Hi-Grade Materials Co., and CJR, a General Partnership	200 AFY

d. Each member of the Small Pumper Class can exercise an overlying right pursuant to the Physical Solution. The Judgment Approving Small Pumper Class Action Settlements is attached as Exhibit C ("Small Pumper Class Judgment") and is incorporated herein by reference.

e. Cross-defendant Charles Tapia, as an individual and as Trustee of Nellie Tapia Family Trust (collectively, "The Tapia Parties") has no right to pump groundwater from the Antelope Valley Adjudication Area except under the terms of the Physical Solution.

f. Phelan Piñon Hills Community Services District ("Phelan") has no right to pump groundwater from the Antelope Valley Adjudication Area except under the terms of the Physical Solution.

g. The Willis Class members have an overlying right that is to be exercised in accordance with the Physical Solution.

h. All defendants or cross-defendants who failed to appear in any of these coordinated and consolidated cases are bound by the Physical Solution and their overlying rights, if any, are subject to the prescriptive rights of the Public Water Suppliers. A list of the parties who failed to appear is attached hereto as Exhibit D.

i. ~~Robar Enterprises, Inc., Hi-Grade Materials Co., and CJR, a general partnership (collectively, "Robar") are~~

~~____~~
~~____~~
~~____~~
~~____.~~

4. Each party shall designate the name, address and email address, to be used for all subsequent notices and service of process by a designation to be filed within thirty days after entry of this Judgment. The list attached as Exhibit A to the Small Pumper Class Judgment shall be used for notice purposes initially, until updated by the Class members and/or Watermaster. The designation may be changed from time to time by filing a written notice with the Court. Any party desiring to be relieved of receiving notice may file a waiver of notice to be approved by the Court. The Court will maintain a list of parties and their respective addresses to whom notice or service of process is to be sent. If no designation is made as required herein, a party's designee shall be deemed to be the attorney of record or, in the absence of an attorney of record, the party at its specified address.

5. All real property owned by the parties within the Basin is subject to this Judgment. It is binding upon all parties, their officers, agents, employees, successors and assigns. Any party, or executor of a deceased party, who transfers real property that is subject to this Judgment shall notify any transferee thereof of this Judgment.

This Judgment shall not bind the parties that cease to own real property within the Basin, and cease to use groundwater, except to the extent required by the terms of an instrument, contract, or other agreement.

The Clerk shall enter this Judgment.

Dated: Dec 23, 2015

JUDGE OF THE SUPERIOR COURT

Appendix H: Data to Document Consistency with Delta Plan Policy WR P1

As stated in the 2020 UWMP Guidebook Appendix C (Draft version dated March 2021):

> "An urban water supplier (Supplier) that anticipates participating in or receiving water supply benefits from a proposed project (covered action[4]) 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 Sacramento-San Joaquin Delta (Delta) should provide information in their 2015 and 2020 Urban Water Management Plans (UWMP's) that can then be used in the covered action process to 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)."

WR P1 subsection (c)(1) further defines what adequately contributing to reduced reliance on the Delta means in terms of (a)(1) above.

> "(c)(1) Water suppliers that have done all the following are contributing to reduced reliance on the Delta and improved regional self-reliance and are therefore consistent with this policy:
>
> > (A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;
> >
> > (B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and
> >
> > (C) Included in the Plan, commencing in 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from

---

[4] Cal. Code Regs., tit. 23, § 5001, subd. (j): A "Covered action" is defined as "an activity which may cause either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment, or a reasonably foreseeable indirect physical change in the environment … "directly undertaken by any public agency""(Pub. Resources Code, § 21065) that (i) will occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh, (ii) will be carried out, approved, or funded by the state or a local public agency, (iii) is covered by one or more provisions of the Delta Plan, and (iv) will have a significant impact on achievement of one or both of the coequal goals or the implementation of government-sponsored flood control programs to reduce risks to people, property, and state interest in the Delta."

> the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code section 1011(a)."

Preparation of UWMPs and Implementation of Projects from the UWMP

PWD completed and submitted to DWR, 2005, 2010, and 2015 Urban Water Management Plans, in addition to this 2020 UWMP. PWD has identified, evaluated and implemented projects that are locally cost effective and technically feasible which improve local reliability and reduce reliance on the Delta.

Expected Outcomes for Measurable Reduction in Delta Reliance

The expected outcomes for PWD's Delta reliance and regional self-reliance were developed based on the approach and guidance described in Appendix C of DWR's Urban Water Management Plan Guidebook 2020 (Draft version dated March 2021) and are summarized in Tables H-1 to H-3 below. This involves setting a baseline and evaluating normal year water demands (potable and non-potable), estimating service area population and water use in gallons per capita per day, evaluating and projecting water supply sources to meet estimated normal year demands including supplies from the Delta, local groundwater, conjunctive use projects, surface water, transfers and exchanges, and non-potable supplies. Inputs to Table H-1, H-2, and H-3 include:

- **Baseline**. In order to calculate the expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance, a baseline is needed to compare against. For consistency with conversations had with DWR, PWD is using year 2010 as the baseline year. This analysis uses a normal water year representation of 2010 as the baseline. Data for the 2010 baseline were taken from PWD's 2005 UWMP as the UWMPs generally do not provide normal water year data for the year that they are adopted (i.e., 2005 UWMP forecasts normal year 2010, 2010 UWMP forecasts normal year 2015, and so on).

- **Service Area Demands**. Service area demands, including demands for non-potable water, for 2010, 2015, and 2020 were taken from projections from the previous (2005, 2010, and 2015) UWMPs. Service area demands 2025 to 2045 were taken from projections developed as part of the 2020 UWMP.

- **Service Area Population**. Consistent with the methodology for service area demands (using normal year projections from the previous UWMP), service area population for 2010 were taken from the previous (2005) UWMP. Consideration was given to using 2010 UWMP service area population projections for 2015 but because the 2015 UWMP had the benefit of complete Census data, year 2015 population data was taken from the 2015 UWMP. 2020 service area population projections were taken from the 2015 UWMP. Year 2025-2045 service area demands were taken from the 2020 UWMP.

The outcome of Table H-1 is a calculation of water use efficiency since the baseline year (2010). The calculation uses the change in gallons per capita per day and service area population to estimate water use efficiency in years 2015 through 2045 compared to the baseline year of 2010.

- **Supplies Contributing to Regional Self-Reliance**. In Table H-2, the estimate of water use efficiency is taken from Table H-1. Other water supplies, such as recycled water and advanced water technologies were taken from previous UWMPs (2005 projections were supplied for 2010 etc.). For years 2025-2045 local supplies were taken from projections prepared for the 2020 UWMP.

The outcome of Table H-2 is an estimate of the supplies contributing to regional self-reliance.

- **CVP/SWP Contract Supplies**. CVP/SWP contract supplies were estimated based on the percentage of Delta supplies provided as a percent of overall imported supplies from the State Water Project. Given that all of PWD's imported supplies come directly from DWR, data provided in the 2019 Delivery and Capability Report was utilized to estimate the percentages of supplies from the Delta watershed.

The outcome of Table H-3 is a calculation of the percent change in supplies from the Delta watershed relative to the 2010 Baseline.

Table H-3 illustrates that from 2010 to 2015, PWD reduced reliance on the Delta and is projected to have a net reduction in reliance on the Delta from the baseline, through year 2045.

Table H-1: Calculation of Water Use Efficiency -To be completed if Water Supplier does not specifically estimate Water Use Efficiency as a supply

Service Area Water Use Efficiency Demands (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Service Area Water Demands with Water Use Efficiency Accounted For	31,034	35,000	22,720	19,720	20,310	21,480	22,780	24,250
Non-Potable Water Demands	2,500	1,000	2,500	500	1,000	1,500	2,000	2,000
Potable Service Area Demands with Water Use Efficiency Accounted For	28,534	34,000	20,220	19,220	19,310	19,980	20,780	22,250

Total Service Area Population	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Service Area Population	132,801	164,312	131,200	126,002	128,998	138,554	145,962	153,766

Water Use Efficiency Since Baseline (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Per Capita Water Use (GPCD)	192	185	138	136	134	129	127	129
Change in Per Capita Water Use from Baseline (GPCD)		(7)	(54)	(56)	(58)	(63)	(65)	(63)
Estimated Water Use Efficiency Since Baseline		1,305	7,970	7,853	8,407	9,790	10,582	10,789

Total Service Area Water Demands (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Service Area Water Demands with Water Use Efficiency	31,034	35,000	22,720	19,720	20,310	21,480	22,780	24,250
Reported Water Use Efficiency or Estimated Water Use Efficiency		1,305	7,970	7,853	8,407	9,790	10,582	10,789
Service Area Water Demands without Water Use Efficiency	31,034	36,305	30,690	27,573	28,717	31,270	33,362	35,039

Table H-2: Calculation of Supplies Contributing to Regional Self-Reliance

Water Supplies Contributing to Regional Self-Reliance (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Water Use Efficiency	0	1,305	7,970	7,853	8,407	9,790	10,582	10,789
Water Recycling	2,500	1,000	2,500	500	1,000	1,500	2,000	2,000
Stormwater Capture and Use								
Advanced Water Technologies								
Conjunctive Use Projects (Groundwater or Surface Water Augmentation)		2,600	5,000	5,325	5,325	5,325	5,325	5,325
Local and Regional Water Supply and Storage Projects (Groundwater)	10,310	12,000	6,280	4,140	2,770	2,770	2,770	2,770
Local and Regional Water Supply and Storage Project (Groundwater Return Flow Credits)				5,000	5,000	5,000	5,000	5,000
Other Programs and Projects the Contribute to Regional Self-Reliance (Surface Water)	3,405	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Water Supplies Contributing to Regional Self-Reliance	16,215	20,905	25,750	26,898	26,502	28,385	29,677	29,884

Service Area Water Demands without Water Use Efficiency (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Service Area Water Demands without Water Use Efficiency Accounted For	31,034	36,305	30,690	27,573	28,717	31,270	33,362	35,039

Change in Regional Self Reliance (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Water Supplies Contributing to Regional Self-Reliance	16,215	20,905	25,750	26,898	26,502	28,385	29,677	29,884
Change in Water Supplies Contributing to Regional Self-Reliance		4,690	9,535	10,683	10,287	12,170	13,462	13,669

Percent Change in Regional Self Reliance (As Percent of Demand w/out WUE)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Percent of Water Supplies Contributing to Regional Self-Reliance	52.2%	57.6%	83.9%	97.6%	92.3%	90.8%	89.0%	85.3%
Change in Percent of Water Supplies Contributing to Regional Self-Reliance		5.3%	31.7%	45.3%	40.0%	38.5%	36.7%	33.0%

Table H-3: Calculation of Reliance on Water Supplies from the Delta Watershed

Water Supplies from the Delta Watershed (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
CVP/SWP Contract Supplies	15,123	12,800	13,200	12,030	11,720	11,400	11,080	11,080
Delta/Delta Tributary Diversions								
Transfers and Exchanges of Supplies from the Delta Watershed (Butte Transfer Agreement)	2,104	2,600	6,200	5,700	5,200	5,200	5,200	5,200
Other Water Supplies from the Delta Watershed	-	-	-	-	-	-	-	-
Total Water Supplies from the Delta Watershed	17,227	15,400	19,400	17,680	17,220	16,750	16,280	16,280

Service Area Water Demands without Water Use Efficiency (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Service Area Water Demands without Water Use Efficiency Accounted For	31,034	36,305	30,690	27,573	28,717	31,270	33,362	35,039

Change in Supplies from the Delta Watershed (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Water Supplies from the Delta Watershed	17,227	15,400	19,400	17,680	17,220	16,750	16,280	16,280
Change in Water Supplies from the Delta Watershed		(1,827)	2,173	453	(7)	(477)	(947)	(947)

Percent Change in Supplies from the Delta Watershed (As a Percent of Demand w/out WUE)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Percent of Water Supplies from the Delta Watershed	55.5%	42.4%	63.2%	64.1%	60.0%	53.6%	48.8%	46.5%
Change in Percent of Water Supplies from the Delta Watershed		-13.1%	7.7%	8.6%	4.5%	-1.9%	-6.7%	-9.0%

Appendix I: Energy Intensity of Water System

Table O-1C: Recommended Energy Reporting - Multiple Water Delivery Products

Enter Start Date for Reporting Period 1/1/2020
End Date 12/31/2020

☐ Is upstream embedded in the values reported?

		Urban Water Supplier Operational Control							
		Water Management Process						Non-Consequential Hydropower (if applicable)	
		Extract and Divert	Place into Storage	Conveyance	Treatment	Distribution	Total Utility	Hydropower	Net Utility
Water Volume Units	*Total Volume of Water Entering Process (volume units)*	*6549*	*0*	*4153*	*11356*	*0*	*N/A*	*9709*	*N/A*
AF	*Retail Potable Deliveries (%)*	*100%*	*100%*	*100%*	*100%*	*100%*		*100%*	
	Retail Non-Potable Deliveries (%)								
	Wholesale Potable Deliveries(%)								
	Wholesale Non-Potable Deliveries (%)								
	Agricultural Deliveries (%)								
	Environmental Deliveries (%)								
	Other (%)								
	Total Percentage [must equal 100%]	*100%*	*100%*	*100%*	*100%*	*100%*	*N/A*	*100%*	*N/A*
	Energy Consumed (kWh)	*4533947*	*0*	*1861443*	*801978*		*7197368*	*1206418*	*8403786*
	Energy Intensity (kWh/vol. converted to MG)	*2124.6*	*#DIV/0!*	*1375.5*	*216.7*	*#DIV/0!*	*N/A*	*381.3*	*N/A*

Water Delivery Type	*Production Volume (volume units defined above)*	*Total Utility (kWh/volume)*	*Net Utility (kWh/volume)*
Retail Potable Deliveries	*22058*	*326.3*	*381.0*
Retail Non-Potable Deliveries	*0*	*0.0*	*0.0*
Wholesale Potable Deliveries	*0*	*0.0*	*0.0*
Wholesale Non-Potable Deliveries	*0*	*0.0*	*0.0*
Agricultural Deliveries	*0*	*0.0*	*0.0*
Environmental Deliveries	*0*	*0.0*	*0.0*
Other	*0*	*0.0*	*0.0*
All Water Delivery Types	*22058*	*326.3*	*381.0*

Quantity of Self-Generated Renewable Energy

289553 kWh

Data Quality *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

Metered Data

Data Quality Narrative:

Validated meter data was provided by PWD.

Narrative:

PWD kept track of energy consumed and volume of water for each source, treatment, or deliver.

Appendix J: 2020 Water Shortage Contingency Plan

May 14, 2021

Job #: 2044225*00

2020 Water Shortage Contingency Plan

Palmdale Water District

PALMDALE WATER DISTRICT

A CENTURY OF SERVICE

Kennedy Jenks

2775 North Ventura Road, Suite 202
Oxnard, California 93036
805-973-5700

Water Shortage Contingency Plan

14 May 2021

Prepared for

Palmdale Water District

2029 E. Ave Q.
Palmdale, CA 93550

KJ Project No. 2044225*00

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List of Acronyms

District	Palmdale Water District
DWR	California Department of Water Resources
ERP	Emergency Response Plan
PWD	Palmdale Water District
SWP	State Water Project
UWMP	Urban Water Management Plan
WSCP	Water Shortage Contingency Plan

DWR Checklist Table for WSCP

Water Code Section	Summary as Applies to UWMP	2020 WSCP Location
Subject: Water Shortage Contingency Planning | 2020 UWMP Guidebook Location: Chapter 8		
10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Full Document
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.	Section 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.	Section 2
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.	Section 3.1
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.	Section 3.1
10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Section 3.2.1
10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Section 3.2.3
10632(a)(4)(C)	Specify locally appropriate operational changes.	Section 3.2.2
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.	Section 3.3.3.1
10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Table 3-4 and 3-7
10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Section 4.1.1
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.	Section 4.1.1
10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Section 2.6
10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Section 3
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.	Section 2.6
10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Section 7.1.1
10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Section 7.1.2
10632(a)(8)(C)	Describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought.	Table 7-1
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.	Section 5.2
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.	Section 1.3

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.	Section 3.2.3

Section 1: Introduction

1.1 Overview

Water supplies may be interrupted or reduced significantly in a number of ways, such as a drought that limits supplies, an earthquake that damages water delivery or storage facilities, a regional power outage or a toxic spill that affects water quality. This Plan addresses the requirements in the California Water Code Section 10632, which requires that every urban water supplier shall prepare and adopt a Water Shortage Contingency Plan (WSCP) as part of its Urban Water Management Plan (UWMP). This WSCP serves as a guide for the intended actions by Palmdale Water District (PWD, the District) during water shortage conditions to improve preparedness for droughts and other impacts on water supplies by describing the process used to address varying degrees of water shortages.

Since the 1991 drought, PWD has approved and adopted numerous conservation resolutions from establishing a voluntary water conservation program, to implementing a water waste policy, declaring water shortage emergency conditions, identifying stages of action and response requirements, and establishing emergency water conservation regulations. Moreover, due to recent drought conditions and the Governor's emergency declarations that required a reduction in overall potable urban water use statewide, PWD developed ordinances and other planning documents to incentivize individual customer conservation and reduce overall water demands. Budget-based tiered water rates were introduced in May 2009 and updated in October 2019.

This WSCP describes the actions PWD will take to identify and respond to water shortage.

1.2 Plan Preparation, Adoption, Submittal and Availability

PWD began preparation of this WSCP in January 2021. The public hearing for the WSCP Plan was noticed in local newspapers (*TBD*), as prescribed in Government Code 6066, which included the time and place of the hearing (*Date and Place TBD*), as well as the location where the plan was available for public inspection. Interested parties, including other local agencies, were notified of the public hearing.

The final draft of the Plan was adopted by the PWD Board of Directors by Resolution No. 21-0XX (provided in Appendix C) and was submitted to the Department of Water Resources (DWR) within 30 days of approval. Additionally, the plan was made available for public review per the requirements of the Water Code.

1.3 Water Shortage Contingency Plan Refinement Procedures

PWD will convene the following departmental staff as needed to re-evaluate and improve procedures for systematically monitoring and evaluating the functionality of the WSCP to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed:

- Water Use Efficiency Staff
- Administrative Staff
- Operational Staff

The WSCP will be reviewed, revised, and refined as appropriate and needed following significant changes to PWD supply portfolio, but no less than every 5 years.

1.4 Relationship to the Urban Water Management Plan

Water Code Section 10632(a) requires that every urban water supplier prepare and adopt a water shortage contingency plan as part of its urban water management plan. While the water shortage contingency plan is a stand-alone document it is updated and adopted in concert with the UWMP. Content of the water shortage are informed by the analysis of water supply reliability conducted pursuant to Water Code Section 10635 (contained in the UWMP). The reliability analysis of the UWMP considers “normal”, “single-dry”, and “5-year drought”.

The reliability of PWD supply is highly dependent on the local groundwater sources, imported water availability, and local surface water availability. As shown in Table 1-1 (from Draft UWMP, subject to revision), in the near term (2021 to 2025) the total supplies are greater than demand in years 2022, 2024, and 2025. However, anticipated supplies are less than anticipated water demands in years 2021 and 2023. The WSCP identifies shortage reduction actions to reduce the shortage gap and actions to augment supplies.

Table 1-1 Near Term Water Supply Reliability Assuming 5-Year Drought

Parameter	2021	2022	2023	2024	2025
Gross Water Use	19,410	19,505	19,620	19,715	20,220
Total Supplies	16,450	26,155	17,475	19,980	24,680
Surplus/Shortfall w/o WSCP Action	***-2,960***	***6,650***	***-2,145***	***265***	***4,460***
WSCP - supply augmentation benefit	N/A	N/A	N/A	N/A	N/A
WSCP - use reduction savings benefit	4,270	N/A	4,316	N/A	N/A
Revised Surplus/(shortfall)	1,310	N/A	2,171	N/A	N/A
Resulting % Use Reduction from WSCP action	22%	N/A	22%	N/A	N/A

Note: Reformatted from UWMP Guidebook, Table 7-5 Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)

Section 2: Procedures for the Annual Water Supply and Demand Assessment

The California Water Code Division 1, Section 350, states:

"The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection."

New provisions in Water Code Section 10632.1. require that an urban water supplier such as PWD conduct an annual water supply and demand assessment ("Annual Assessment"), on or before July 1 of each year, to be submitted to DWR. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its Annual Assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later. The requirement to perform the Annual Assessment begins in July 2022. The procedures for performing the Annual Assessment are to be detailed in an urban suppliers' Water Shortage Contingency Plan.

This section of the WSCP provides the written procedure for PWD's Annual Assessment.

2.1.1 Timeline for Conducting the Annual Assessment

Table 2-1 provides targets for performing the Annual Assessment and outlines actions for a normal year and one year of drought. By starting to plan in July, PWD will get a snapshot of conditions and can begin to prepare to mitigate supply and start outreach to customers to manage demand. Major actions are proposed in January 2022, when an initial estimate of supply is made and compared to demand. A final annual assessment is proposed in April 2022.

Table 2-1. Timeline for Decision Making Process to Perform Annual Assessment

Target Date	Action
Jul-Dec	• Monitor supply sources • Monitor demand trends
Jan	• Confirm anticipated weather (e.g., National Weather Service Climate Prediction Center, La Niña, US Drought Seasonal Outlook) • Confirm State Water Project (SWP initial allocation) • Confirm available groundwater • Confirm groundwater production capacity • Evaluate storage in Littlerock Dam Reservoir available to PWD • Prepare initial assessment of Supplies *(Supply Table 1)*
Feb	• Prepare informational item to the Board of Directors
Mar	• Make initial assessment of unconstrained demand (*Demand Tables 1, 2, 3*) • Make initial estimate of shortage • If shortage anticipated, form Water Shortage Task Force • Confirm current SWP allocation • Confirm groundwater production capacity • Estimate supply/storage in Littlerock Dam Reservoir available to PWD
April	• Start public outreach • Complete Draft Annual Assessment and present to Board of Directors • If necessary, prepare notices of public hearing on water shortage
May-July	• Continue public outreach • Update Annual Water Assessment, present to Board of Directors • Finalize Annual Water Assessment and submit to DWR • If necessary, declare water shortage and implement supply mitigations and demand reduction actions • Monitor customer response to water shortage messaging and other actions

2.2 Factors Affecting Demand and Supply

2.2.1 Weather Outlook

Weather affects PWD supplies in many ways. For many of the supplies, the effects of weather are seen over the long-term and are reflected in reservoir levels and groundwater levels. There are some resources and phenomena that can be considered when looking at the sources of supply:

- Potential for La Niña. ENSO (El Niño Southern Oscillation) is the warming and cooling of the ocean water along the Equator in the Eastern Pacific Ocean near South America. The warm phase is called El Niño and the cold phase is called La Niña. When the Eastern Pacific Ocean is 0.5 degrees Celsius above normal for 5 consecutive 3-month average periods, an El Niño is declared. When the Eastern Pacific Ocean is 0.5 degrees Celsius below normal for 5 consecutive 3-month average periods, a La Niña is declared. The El Niño and La Niña are declared as Weak, Moderate, or Strong depending on how far from normal the water temperature gets. When the temperature is above 1.5 degrees Celsius, it is declared as strong. When the temperature is above 1.0 degrees Celsius, it is declared as Moderate. When the temperature is above 0.5 degrees Celsius, it is declared as Weak. With El Niños, the High Desert tends experience increased precipitation, and decreased precipitation with La Niñas. The National Weather Service Climate Prediction Center provides information on potential for La Niña conditions.

- US Drought Information Seasonal Outlook. The National Weather Service Climate Prediction Center provides information geographically on drought conditions and categorizes geographies as “Drought Persists”, “Drought Remains but Improves”, “Drought Removal Likely”, and “Drought Development Likely”.

2.3 Current Year Unconstrained Demand

DWR guidance for the Annual Assessment is to consider the expected water use in the upcoming year, based on recent water use, and before any projected response actions a Supplier may trigger under its Water Shortage Contingency Plan.

2.3.1 Land Use

To evaluate water demand, PWD is required examine current and projected land uses. PWD incorporates City of Palmdale’s information on land use in its Master Plan Updates and is part of the City’s Development Advisory Board (DAB). The DAB participation will assist with relatively short-term forecasting of upcoming land use development. Using the known built and pending connections, a summarized total of the existing land use within the service area and potential future land use can used to assess total land use development.

2.3.2 Current Demand

PWD will create a table that will summarize the total water consumption (potable, recycled, and untreated) for each consumption category within the water service area for the most recent 5-year average, by month (*Demand Table 1*). Based on anticipated weather, ***Demand Table 1*** may be adjusted to assume an increase in current demands. *Demand Table 1* will estimate existing demand in the current calendar year and demand in the subsequent calendar year. For the purposes of the analysis the subsequent year will be assumed to be a drought year.

2.3.3 Potential Demand

PWD will create a table showing anticipated demands from “Under Construction and Approved Projects” (*Demand Table 2*) derived from the Water Service Availability Letters issuance and conditions. In *Demand Table 2* anticipated water use will be forecasted by month. The calculations in *Demand Table 2* will develop or use any recently developed demand factors inclusive of water loss and including a contingency to account for annual demand variations that are likely to occur.

Demand Table 2 will reflect anticipated demands in the current calendar year and demand in the subsequent calendar year. For the purposes of the analysis the subsequent year will be assumed to be a drought year.

2.3.4 Total Near-Term Demands

Near-term water demands (*Demand Table 3*) will be the sum of the demands reflected in *Demand Table 1* plus *Demand Table 2*.

2.4 Assessing Supply in Current Year and One Dry Year

PWD will evaluate the total water sources available, including imported water, local groundwater, local surface water, recycled water, and other sources as they are put into service. Table 2-2 summarizes the factors to be considered.

Using Table 2-2 as a guide, PWD will develop a summary of each water source available in the upcoming year assuming the current and subsequent year will be dry years. *Supply Table 1* will also be developed, in which a quantified summary of each anticipated supply source is provided for the upcoming year assuming the current and subsequent year are dry years. Anticipated water supply will be forecasted by month using past supply patterns.

2.5 Assessing Water Supply Reliability

PWD will compare *Supply Table 1* and *Demand Table 3* and determine if a supply shortage is anticipated, the level of shortage, and prepare if necessary, to implement its water shortage contingency plan.

2.6 Steps Following the Annual Assessment

The District has the power and authority to implement and enforce its shortage response actions including mandatory water conservation measures within its boundaries per Division 11 of the California Water Code as previously exercised by Resolution No. 09-04, which was adopted in March 2009. Shortage response actions are described in Section 3. PWD will declare the appropriate stage of a water shortage emergency in accordance with Chapter 3, commencing with Section 350, of Division 1 of the California Water Code. Should a water shortage be declared, PWD may coordinate with the City of Palmdale and the County of Los Angeles for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

Table 2-2. Annual Assessment of Supply

Source	Factors to be Evaluated in Current Year	Establishing Supply in Assumed Subsequent Dry Year
Local Groundwater	Regulatory limitations	Regulatory limitations
	Groundwater level	Groundwater level
	Any constraints on supply due to infrastructure or water quality	Any constraints on supply due to infrastructure or water quality
	Consider if supply would be managed differently if it is known subsequent year will be dry year	
Local Surface Water	Regulatory limitations	Regulatory limitations
	Any constraints on supply due to infrastructure or water quality	Any constraints on supply due to infrastructure or water quality
Imported Water (SWP)	Water supply available under contract with DWR and any existing transfers and exchanges	Water supply available under contract with DWR and any existing transfers and exchanges
	Any constraints on supply due to infrastructure or water quality	Any constraints on supply due to infrastructure or water quality
	Consider if supply would be managed differently if it is known subsequent year will be dry year	
Recycled Water	What is current annual recycled water production capability	What is current annual recycled water production capability
	What is current annual demand + new (12 months) demand	What is current annual demand + new (24 months) demand

Section 3: Six Standard Water Shortage Levels

3.1 Stages of Action to Respond to Water Shortages

As required by California Water Code Section 10632(a)(3)(A), this WSCP is framed around six standard water shortage stages, which correspond to progressive ranges of percent supply reductions from zero to more than fifty percent. Table 3-1 presents a description of the six water supply shortage stages, defined as stages I to VI.

Each stage may be triggered by a declaration from federal or state authorities, or PWD to address events that result in a water shortage. The stages and applicable water supply conditions are summarized in Table 3-1 and Table 3-2.

Table 3-1: Rationing and Reduction Goals

Deficiency or State Mandated Reduction	Stage	Demand Reduction Goal	Type of Program	Water Shortage Condition
1-10%	1	10% reduction	Voluntary	Minor Shortage
11-20%	2	20% reduction	Mandatory	Moderate Shortage
21-30%	3	30% reduction	Mandatory	Severe Shortage
31-40%	4	40% reduction	Mandatory	Critical Shortage
41-50%	5	50% reduction	Mandatory	Emergency Shortage
>50%	6	>50% reduction	Mandatory	Catastrophic Failure

DWR Table 8-1

Table 3-2. Stages of PWD Water Shortage Contingency Plan

Stage	Percent Supply Reduction	Triggers
I	Up to 10%	• Results of the Annual Assessment • Federal, state or local disaster declaration that may impact water supplies • State declaration due to drought or system maintenance • Unplanned PWD water system maintenance
II	Up to 20%	• Results of the Annual Assessment • Federal, state or local disaster declaration that may impact water supplies • State declaration due to drought or system maintenance • Unplanned PWD water system maintenance requiring more time to repair

Stage	Percent Supply Reduction	Triggers
III	Up to 30%	• Results of the Annual Assessment • Federal, state or local disaster declaration that may impact water supplies • State determination due to drought or significant system failure; and/or • Unplanned PWD water system failure or emergency
IV	Up to 40%	• Federal, state or local disaster declaration that may impact water supplies • State determination due to drought or significant system failure; and/or • Unplanned PWD water system failure or emergency
V	Up to 50%	• Results of the Annual Assessment • Federal, state or local disaster declaration that may impact water supplies • State determination due to drought or significant system failure; and/or • Advanced PWD water system failure or emergency
Stage VI	50% or higher	• Results of the Annual Assessment • Federal, state or local disaster declaration that may impact water supplies • State determination due to drought or significant system failure • Natural or human-caused catastrophe disrupting delivery of water to, or within the service area • Severe PWD water system failure

3.1.1 Procedures for Water Shortage Level Determination

The results of the Annual Assessment will be used to determine the water shortage level. In case of emergencies, a special meeting may be called by a majority of the Board on less than twenty-four-hour notice and without an agenda to deal with the disruption of service. If an emergency arises which would ordinarily be brought to the attention of the Board, but insufficient time exists, the General Manager has administrative authority to take action as deemed appropriate and reasonable.

3.2 Water Shortage Response Actions

Once a shortage stage is declared, PWD may implement shortage response actions required by the customer and through operational changes, as listed in Table 3-3. These actions will be supported by communication protocols (discussed in Section 4.1.1), enforcement actions (discussed in Section 3.3.2) and monitoring and reporting efforts (discussed in Section 5.2) activities appropriate at each shortage stage level.

Table 3-3: Customer and PWD Water Shortage Actions

Stage	District Actions	Customer Actions
Stage I	• Initiate public information campaign • Increase awareness of conservation measures and water use efficiency programs • Conduct focused outreach to large water users • Consider coordination of public outreach with the cities and County • Publish Water Shortage Event Contingency Plan stages and actions per stage • Consider implementation of drought factor for customer bill calculation • Consider enforcement of conservation measures	• Comply with PWD Water Waste Policy (see Table 3-3 and Appendix B) • Voluntary water conservation • Adhere to conservation measures • Consider conversion to more efficient irrigation methods • Consider turf removal and conversion to Water Wise Landscape • Patronize local carwashes that recycle their water • Consider PWD Water Use Efficiency Rebate Programs
Stage II	• Continue previous action • Expand public information campaign • Commence enforcement of conservation measures • Implement of drought factor for customer bill • Suspend issuance of potable construction meters.	• Comply with PWD Water Waste Policy (see Table 3-3and Appendix B) • Comply with mandatory conservation regulations • Continue previous actions
Stage III	• Continue previous actions • Intensify public information campaign • Expand enforcement of conservation measures • Provide regular media public briefings • Activate emergency connections with mutual aid agencies • Evaluate size of monetary fines for water waste • Begin water waste patrols	• Comply with PWD Water Waste Policy (see Table 3-3and Appendix B) • Continue previous actions • Limit washing of sidewalks, driveways, walkways, parking lots, or any other hard-surfaced area by hose or flooding unless otherwise necessary • Comply with prohibited outdoor irrigation of ornamental landscape or turf with potable water through an irrigation system between 9:00 am and 6:00 pm and limit system use to two days a week
Stage IV	• Continue previous actions	• Comply with PWD Water Waste Policy (see Table 3-3and Appendix B) • Continue previous actions • Obligation to fix leaks, breaks, or malfunctions within 48 hours
Stage V	• Continue previous actions • Enforce mandatory water consumption goals and allocations for all customers and users	• Comply with PWD Water Waste Policy (see Table 3-3and Appendix B) • Continue previous actions
Stage VI	• Continue previous actions • Implement crisis communication plan • Activate Emergency Operations Center	• Continue previous actions • Terminate outdoor water use for irrigation, pools and

Stage	District Actions	Customer Actions
	- Coordinate actions with regulatory agencies - Coordinate actions with public safety agencies to address enforcement and fire protection issues - Recall all temporary meters and activate water fill stations - Suspend issuance of new development approvals and new water connections other than those required to be processed by state law	fountains - Water may only be used outdoors for public health and safety purposes - Be on alert for Boil Water Orders if they become necessary

3.2.1 Supply Augmentation

Any water shortage event should trigger a review of potential sources for supplemental water supply. Potential sources for supplemental water include increasing allocation of State Water Project water (infrastructure not currently available) or utilizing water from the Palmdale GRRP. Any supplemental water supply project or improvements to existing facilities to allow for entitled flows should be a priority for consideration in immediate capital projects if shortage (e.g., demands exceeding supplies) greater than ten percent is anticipated or when a Stage 3 Water Shortage Event continues for more than 18 months. Additional supply sources for consideration include replacement or rehabilitated wells increased use of reclaimed water, and other alternatives based on the actual circumstances at that time. Supply augmentation in near term is presented in Table 3-4 below.

Table 3-4. Supply Augmentation Actions

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier *(based on DWR's WUE database categories)*	How much is this going to reduce the shortage gap?	Additional Explanation or Reference
3	Groundwater	2,000 AF	Pump Additional Groundwater
4	Groundwater	1,000 AF	Pump Additional Groundwater
5	Groundwater	1,000 AF	Pump Additional Groundwater
6	Groundwater	500 AF	Pump Additional Groundwater

Note: (DWR Table 8-3)

3.2.2 Operational Changes

PWD shall comply with the restrictions similar to those implemented for the public to the extent possible. Hydrant flushing shall be limited except as deemed necessary by the General Manager to enhance water quality or to conduct fire flow and large meter tests. Other actions include efficient water use practices identified in Table 3-5, such as minimizing waste of water in construction, following a modified outdoor landscape watering schedule for PWD facilities depending on shortage stage, and fixing any identified leaks in the distribution system or other related water infrastructure components.

3.2.3 Demand Reduction Actions

PWD permanently implements general water conservation measures and irrigation practices aimed at increasing everyday water use efficiency. Those measures, plus those to be enacted in the various stages, are presented in Table 3-5 and are also indicated in the District's Water Waste Policy.

Table 3-5. Prohibitions During Different Shortage Stages

Stage	Prohibition/Requirement
In Effect at All Times	Water waste is prohibited at all times. Water waste includes but is not limited to: • Application of potable water to outdoor landscapes in a manner that causes runoff. • Water leaks shall be repaired in a timely manner and sprinklers shall be adjusted to eliminate over-spray. • Hosing of hardscape surfaces, except where health and safety needs dictate, is prohibited. • No watering of outdoor landscapes within 48 hours of measurable rainfall. • Car washing and outside cleaning activities prohibited except when performed with buckets and automatic hose shutoff devices. • The serving of drinking water other than upon request in eating or drinking establishments is prohibited. • 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. Other • Water for construction purposes, including but not limited to de-brushing of vacant land, compaction of fills and pads, trench backfill, and other construction uses shall be in an efficient manner.
Stage I	• Same as In Effect At All Times
Stage II	• All restrictions/prohibitions/initiatives from Stage I are in effect • Landscape watering between the hours of 1000 and 1800 hours is prohibited • Outdoor watering is limited to 3 days per week. • Irrigation with potable water outside of newly constructed homes and buildings not delivered by drip or microspray is prohibited. • Suspend issuance of potable water construction meters.

Stage	Prohibition/Requirement
Stage III	• All restrictions/prohibitions/initiatives from Stage I and Stage II are in effect and are mandatory. • Irrigation with potable water of ornamental turf on public street medians is prohibited. • Outdoor watering is limited to 2 days per week. • Potable water cannot be used to maintain fountains, reflection ponds and decorative water bodies for aesthetic or scenic purposes, except where necessary to support aquatic life.
Stage IV	• All restrictions/prohibitions/initiatives from Stage I, Stage II, and Stage III are in effect and are mandatory. • Outdoor watering is limited to 1 day per week. • Filling of new swimming pools, spas, hot tubs, or the draining and refilling of existing pools, etc is prohibited. Topping off is allowed to the extent that the designated water allocation is not exceeded. • Meters will only be installed for new accounts where the building permit was issued prior to the declaration of the water shortage.
Stage V	• Filling of new swimming pools, spas, hot tubs, or the draining and refilling of existing pools, etc is prohibited. Topping off is allowed to the extent that the designated water allocation is not exceeded. • Meters will only be installed for new accounts where the building permit was issued prior to the declaration of the water shortage
Stage VI	• All restrictions/prohibitions/initiatives from previous Shortage Stages are in effect and are mandatory. • No meters will be installed for new accounts. • Outdoor irrigation is prohibited, with the exception of drip or hand watering to preserve established trees.

As described in the table above, prohibitions and restrictions on water features that are artificially supplied with water, such as ornamental lakes, ponds and decorative fountains are treated differently from swimming pools and spas, as defined in Section 115921 of the California Health and Safety Code.

3.2.3.1 Emergency Response Plan

In order to prepare for catastrophic events, the PWD has prepared an Emergency Response Plan (ERP) in accordance with other state and federal regulations. The purpose of the ERP is to design actions necessary to minimize the impacts of supply interruptions due to catastrophic events.

The ERP includes PWD’s standardized response and recovery procedures to prevent, minimize, and mitigate injury and damage resulting from emergencies or disasters. The ERP includes, or is planned to include incident response procedures for the following incidents:

- Evacuation
- Earthquake
- Fire
- Wildfire
- Flood
- Power Outage
- Drought
- HazMat Release
- Security Incidents
- Bomb Threat
- Single-Employee Security Incident
- Personnel Injury
- Contamination
- Transmission/Main Break
- Distribution Line Break
- Pandemic

The plan considers the various aspects of the potential for malevolent threats or actual terrorism. The information contained in the ERP is intended to guide staff and inform other emergency responding agencies and includes plans, procedures, lists, and identification of equipment, emergency contacts, etc.

3.2.3.2 Seismic Risk Assessment and Mitigation Plan

PWD owns and operates water storage and distribution, treatment, and groundwater pumping facilities. The water distribution system is comprised of two separate systems – one for potable water and the other for recycled water. In 2021 PWD performed the following to understand, plan, for and mitigate seismic risk:

- Evaluated seismic risk zone for the PWD service area
- Identified critical water facilities and seismic and building deficiencies
- Identified mitigation measures to reduce seismic risk at facilities.

This section summarizes the 2020 seismic risk assessment and provides an update of the seismic vulnerability of the drinking water supply, treatment, storage, and distribution facilities and mitigation plan for the water system (Kennedy Jenks 2021). The Seismic Evaluation is included in Appendix C.

3.2.3.2.1 Seismic Evaluation and Mitigation for Steel Tanks

Geotechnical work was conducted for PWD's above-ground potable water reservoirs located on 19 sites in the Palmdale area, to classify sites for repair and retrofit needs. Design level earthquake values were identified for each tank evaluation, corresponding to the appropriate American Society of Civil Engineers design level earthquake.

A seismic evaluation was performed to identify seismic deficiencies and recommend strengthening measures for each of the welded carbon steel tanks. Work included a written description for each tank summarizing the results of the interior and exterior inspections and condition assessments; and the findings of the desktop evaluation.

Several tanks were found to have deficiencies, due to one or more of the following:

- age of the tank
- code which was applicable at the time the tank was designed,
- dimensions of the tank diameter to height ratio,
- lack of anchorage to foundations

The tank structural and seismic evaluation investigated several mitigation concepts in order to bring the tanks within code compliance. These mitigation concepts included arranging for a civil or structural engineer to inspect PWD facilities, consulting with a geotechnical engineering firm to perform site investigations and provide a more detailed analysis, increasing freeboard height to accommodate wave action, and combinations of these.

PWD will prioritize tanks for repairs and replacement based on the likelihood and consequences of various types of damage associated with code compliance issues identified.

3.2.3.2.2 Seismic Evaluation and Mitigation for Pump Stations, Pressure Reducing Valves, Wells or Well Pump Stations

Seismic assessments were performed for the booster pump stations, wells, and booster pump buildings. Work included documentation of facility descriptions, seismic deficiencies, and seismic mitigation measures. Many of these facilities had identified deficiencies associated with anchorage to foundations and walls, inadequate load path to transfer later loads, and thin slabs. Similar to the tank evaluation, additional analysis is recommended.

3.3 Benefit of Shortage Response Actions

As discussed above, supply actions and actions within PWD operations will help reduce water shortage. Closing the “gap” between supplies and demands through customer actions, will include:

- Public Information
- Enforcement
- Restrictions on Non-Essential Water Uses
- Pricing

The water shortage response actions and their anticipated effect are summarized in Table 3-7.

3.3.1 Public Information

Without exception, experience has shown that a well-informed public is generally more willing to heed requests to voluntarily conserve or alter water use patterns and will be more likely to comply if mandatory water use restrictions become necessary. DWR (2008) estimates that public information campaigns have alone reduced demand in the range of **5 to 20** percent, depending on the time, money, and effort spent. Public information supports voluntary and mandatory measures by educating and convincing the public that a critical water shortage exists and provides information on how water is used and how they can help. The DWR Drought Guidebook highlights that when the public perceives a drought to be severe, they change behaviors (such as flushing the toilet less often).

The information provided to the public should include a description of the conditions that will trigger implementation of shortage stages as well as a description of what the plan entails (restrictions, enforcement provisions, etc.). It is also advisable to provide practical “consumer” information that will help water users comply with the plan. For example, information about restrictions on lawn watering might be accompanied with information about proper lawn watering practices.

Based on past experience, with minimal public outreach, a water savings of 5 percent is assumed, with extensive public outreach a water savings of 7 percent is assumed, public information combined with enforcement (see section 3.3.2) is assumed to achieve a savings of up to 22 percent.

3.3.2 Enforcement

A study examining the effectiveness of drought management programs in reducing residential water-use (Virginia Polytechnic Institute 2006) showed considerable variation in the effectiveness of drought management programs and highlighted the importance of public information and enforcement. Results, shown in Table 3-6, indicate that overall reductions in residential water-use ranged from 0-7 percent for voluntary restrictions and from 0-22 percent for mandatory restrictions. The observed differences were statistically attributed to information efforts for voluntary restrictions and both information and enforcement efforts for mandatory restrictions.

Table 3-6. Drought Program Management Variables Effect on Residential Water-Use

Classification	Estimated Change in Water-Use	Statistically Different than No Effect?
Voluntary Restrictions		
Little or no information disseminated	-2%	No
Moderate level of information	-2%	No
Aggressive information dissemination	-7%	Yes
Mandatory Restrictions		
Low information and low enforcement	-5%	No
Moderate information and low enforcement	-6%	Yes
Aggressive information and low enforcement	-12%	Yes
Low information and moderate enforcement	-4%	No
Moderate information and enforcement	-9%	Yes
Aggressive information and moderate enforcement	-15%	Yes
Moderate information and aggressive enforcement	-20%	Yes
Aggressive information and enforcement	-22%	Yes

Source: Virginia Polytechnic Institute 2006

The analysis highlights the key role that public outreach and information plays in the success of drought response actions. Voluntary restriction programs with little to moderate levels of information dissemination had no appreciable effect on water-use. Voluntary restriction programs with active promotional efforts, however, reduced water-use by an estimated 7 percent from what would have otherwise occurred without any restriction program. Thus, for voluntary restrictions, only the most intense programs had even a moderate level of success in reducing water-use.

The analysis highlights the key role that public outreach and information plays in the success of drought response actions. Voluntary restriction programs with little to moderate levels of information dissemination had no appreciable effect on water-use. Voluntary restriction programs with active promotional efforts, however, reduced water-use by an estimated 7 percent from what would have otherwise occurred without any restriction program. Thus for voluntary restrictions, only the most intense programs had even a moderate level of success in reducing water-use.

Mandatory restriction programs without a significant enforcement component broadly mirrored the outcomes achieved by the voluntary programs. Programs with mandatory restrictions that invested minimal effort in information dissemination did not appreciably reduce residential water-use. Programs with no active enforcement efforts but with moderate to high levels of informational dissemination achieved 6 and 12 percent reductions in water-use, respectively. These estimated reductions are similar to those achieved by voluntary programs with aggressive informational campaigns.

The experience the City of Santa Cruz had implementing its Drought Contingency Plan and successfully reaching its reduction goals supports the importance of a strong public information program. Analysis of the implementation program identified the key ingredient to its success was "the public’s understanding, awareness, and belief that the City was confronted with a true water shortage problem. Media coverage of water problems across California reinforced the situation. Without that sense of a real and imminent problem, it’s likely the level of cooperation and willingness demonstrated by the community in making changes they did might have been considerably reduced." (Santa Cruz 2010)

Delivering accurate and timely information to water users, news media and local governments with updates on conditions, restrictions, and helpful contact information is key.

With aggressive information dissemination and enforcement its assumed PWD could achieve a 22 percent water savings.

3.3.3 Restrictions on Non-Essential Water Uses

PWD’s water waste policy focuses on curtailing water waste and non-essential water use. Outdoor water use, including washing sidewalks and watering ornamental landscapes is targeted. These uses are typically considered to be discretionary or nonessential, are highly visible, and therefore relatively easy to monitor, and often are a substantial component of water demand, particularly during the summer months when drought conditions are likely most severe.

Given the significance and visibility of lawn watering as the predominant component of seasonal use, best management practices in drought contingency plans typically prescribe time-of-use and other restrictions on lawn watering. This often involves placing water users on a schedule which allows for staggered lawn watering days, as well as restrictions on the times during the day when lawns can be watered. Additionally, this may include the suspension of potable water construction meters.

The American Waterworks Association estimates that voluntary outdoor water use limits can result in a water savings of **up to 10 percent** and mandatory outdoor water limits can achieve **up to a 56** percent reduction in outdoor water use (AWWA 2008, AWWA 2011). Specifically, case studies found that:

- Restricting water use to every third day reduced water use by 22 percent

- Restricting water use to twice a week reduced water use by 33 percent
- Restricting water use to once a week saved 56 percent

PWD performed a detailed review of water use as part of its 2019 Financial Planning Study (PWD 2019). This analysis estimated that for residential customers, approximately 52% of water use was outdoors. Residential water demand makes up approximately 77% of PWD's overall demands Therefore:

- Voluntary outdoor water limits that saved 10% of outdoor residential demands would reduce overall water demand by 4% (0.1*0.52*0.77).
- Restricting water use to twice a week could reduce outdoor water use by 33%, reducing overall water demand by 13% (0.33*0.52*0.77).
- Restricting water use to once a week could reduce outdoor water use by 56%, reducing overall water demand by 22% (0.56*0.52*0.77).

3.3.3.1 Additional Mandatory Restrictions

The State, through the State Water Board, adopted drought emergency conservation regulations in July 2014. The Board expanded, updated, extended, and readopted the emergency regulations several times and in the prohibitions on wasteful water use practices were in place until November 25th, 2017.

As directed by Executive Order B-40-17, the State Water Board is conducting a rulemaking to put in place permanent prohibitions on wasteful water use practices. This rulemaking is part of the broader legislation, *Making Water Conservation a California Way of Life*.

The specific outcome of the permanent prohibitions cannot be known at this time. The emergency conservation regulations in effect through November 2017 included the following prohibitions:

- 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;
- 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
- The application of potable water to driveways and sidewalks
- The use of potable water in a fountain or other decorative water feature except where the water is part of a recirculating system
- The application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall
- The serving of drinking water other than upon request in eating or drinking establishments
- Irrigation with potable water of ornamental turf on public street medians.

The emergency conservation regulations further required that:

- 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

- Commercial, industrial, and institutional properties shall limit outdoor irrigation of ornamental landscapes or turf with potable water to no more than two days per week

PWD's water use restrictions are consistent with the State's prohibitions to prevent water waste. However, dependent on the declared drought stage, PWD may have restrictions and requirements in addition to those of the State such as:

- Limiting outdoor irrigation of ornamental landscape or turf with potable water to certain hours and to certain days of the week (all customer types, not just Commercial, Industrial, or Institutional properties)
- Prohibiting all outdoor irrigation with potable water
- Prohibiting filling of swimming pools, spas, and wading pools

3.3.4 Drought Surcharge Rates

PWD has a drought rate structure to recover costs related to increased effort during drought. While not a specifically meant to reduce water demand, drought surcharge rates are expected to decrease water demands.

Past studies reveal that water use decreases when utilities install water meters and impose commodity charges. AWWA estimates that water use decreases between 15 to 40 percent when customers are charged a commodity rate rather than a flat rate (AWWA 2008). This indicates that customers are price sensitive and will adjust habits to reduce their cost of water. The actual extent that increasing rates during a drought can result in decreased water use is uncertain.

AWWA studies indicate that the effectiveness of pricing to reduce water use is very dependent on the affluence of the water utility customer base. As a rule of thumb, AWWA estimates that marginal price increases in water (up to 10 percent) reduce water use by 1.5 to 7 percent; price increases greater than 10 percent are necessary to achieve water use reductions greater than 10 percent (AWWA 2008).

Based on AWWA data its assumed that water use reductions of 10 to 15 percent will be achieved with drought rates.

Table 3-7. Effectiveness Demand Reduction and Other Actions

Shortage Level	Demand Reduction Actions	Reduction in Shortage Gap	Explanation	Penalty, Charge, or Other Enforcement?
1	Expand Public Information Campaign	7%	Based on AWWA 2008 assumes savings of 7%	No
2	Expand Public Information Campaign	22%	Based on AWWA 2008 assumes savings of 22% with enforcement	Yes
2	Implement or Modify Drought Rate Structure or Surcharge	10%	Based on AWWA 2011 assumes savings of 10%	Yes
3	Expand Public Information Campaign	22%	Based on AWWA 2008 assumes savings of 22% with enforcement	Yes
3	Implement or Modify Drought Rate Structure or Surcharge	10%	Based on AWWA 2011 assumes savings of 10%	Yes
3	Landscape - Other landscape restriction or prohibition	4%	Outdoor water limited to 3 days a week. Based on AWWA 2011.	Yes
4	Expand Public Information Campaign	22%	Based on AWWA 2008 assumes savings of 22% with enforcement	Yes
4	Implement or Modify Drought Rate Structure or Surcharge	15%	Based on AWWA 2011 assumes savings of 15%	Yes
4	Landscape - Other landscape restriction or prohibition	13%	Outdoor water limited to 2 days a week. Based on AWWA 2011.	Yes
5	Expand Public Information Campaign	22%	Based on AWWA 2008 assumes savings of 22% with enforcement	Yes
5	Implement or Modify Drought Rate Structure or Surcharge	15%	Based on AWWA 2011 assumes savings of 15%	Yes
5	Landscape - Other landscape restriction or prohibition	22%	Outdoor water limited to 1 day a week. Based on AWWA 2011.	Yes

Table 3-7. cont.

Shortage Level	Demand Reduction Actions	Reduction in Shortage Gap	Explanation	Penalty, Charge, or Other Enforcement?
6	Expand Public Information Campaign	22%	Based on AWWA 2008 assumes savings of 22% with enforcement	Yes
6	Implement or Modify Drought Rate Structure or Surcharge	15%	Based on AWWA 2011 assumes savings of 15%	Yes
6	Landscape - Other landscape restriction or prohibition	52%	Outdoor water use prohibited	Yes

DWR Table 8-2

Section 4: Communications Protocols

4.1.1 Communications Protocols and Customer Outreach

Customer participation is a key element in responding to a supply shortage, while general media coverage of a drought is likely to increase awareness. Multiple communication channels will continue to be used by PWD staff to communicate water shortage conditions and necessary actions to the PWD Board of Directors, customers, residential homeowners associations, business chambers, inter-governmental bodies, essential facilities (schools, hospitals, fire and police department), and other stakeholders. Communication methods include the following:

- Public water conservation forums hosted at PWD headquarters, off- site locations, or through virtual platforms.
- Attendance and agenda presentation at local city council meetings.
- Attendance and agenda presentations at home-owners association and business chamber meetings.
- Direct mailings and bill inserts to customers and account holders.
- Press releases.
- PWD publications, e.g., “The Pipeline”.
- Updated posting of issues and information on PWD website.
- Advertisements in local publications and cable channels.
- Cards, table tents, door hangers and other leave-behind reminders.
- Social media updates and postings

Table 4-1 describes communication protocols and procedures to be used by PWD for outreach to customers to reduce demand during each defined shortage stage. The shortage stages are further defined in Section 3.1.

Table 4-1. Communication Protocols and Procedures to Support Shortage Response Actions

Shortage Stage	Percent Supply Reduction	Communication Protocols and Procedures *(Outreach to customers when each Stage is declared)*
I	Up to 10%	- Declaration and notification of water supply shortage I by resolution, and adoption at a public meeting in accordance with state law. - Notification of supply shortage in Public Newspaper
II	Up to 20%	- Declaration and notification of water supply shortage II by resolution, and adoption at a public meeting in accordance with state law. - Notification of supply shortage in Public Newspaper - Advertisement in Local Public Newspaper - Commence social media updates - Notify top 5 water users in each customer class, e.g. residential, and CII
III	Up to 30%	- Declaration and notification of water supply shortage III by resolution, and adoption at a public meeting in accordance with state law. - Notification of supply shortage in Public Newspaper - Advertisement in Local Public Newspaper and local cable channel - Schedule regular media, city council and County briefings - Continue social media updates - Targeted Messaging to customers - Notify top 10 water users in each customer class, e.g. residential, and CII
IV	Up to 40%	- Declaration and notification of water supply shortage IV by resolution, and adoption at a public meeting in accordance with state law. - Notification of supply shortage in Public Newspaper - Advertisement in Local Public Newspaper and local cable channel -Continue regular media, city council and County briefings - Continue social media updates - Targeted Messaging to customers - Notify top 15 water users in each customer class, e.g. residential, and CII
V	Up to 50%	- Declaration and notification of water supply shortage V by resolution, and adoption at a public meeting in accordance with state law. - Notification of supply shortage in Public Newspaper - Advertisement in Local Public Newspaper and local cable channel - Continue regular media, city council and County briefings - Continue social media updates - Targeted Messaging to customers - Notify top 20 water users in each customer class, e.g. residential, and CII
VI	50% of More	- Declaration and notification of water supply shortage VI by resolution, and adoption at a public meeting in accordance with state law. - Notification of supply shortage in Public Newspaper - Advertisement in Local Public Newspaper and local cable channel - Continue regular media, city council and County briefings - Continue social media updates - Targeted Messaging to customers - Notify top 25 water users in each customer class, e.g. residential, and CII

Section 5: Monitoring and Reporting

Monitoring is essential to ensure that the response actions are achieving their intended water use reduction purposes, or if improvements or new actions need to be considered.

5.1 Mechanism to Determine Reductions in Water Use and to Meet State Reporting Requirements

The PWD has meters on all residential, commercial and landscape service connections in the service area and requires meters on all new connections. These meters record the amount of water consumption at each location. These meters in combination with billing information will be used to monitor actual reductions in water use.

5.2 Monitoring and Reporting

Certain aspects of water conservation can be readily monitored and evaluated, such as metered water use and production quantities. Other aspects such as public education are more difficult to measure in terms of effectiveness. Additionally, weather patterns make it more difficult to compare one year’s water demand and conservation results with another year's usage.

When severe shortages occur and some degree of mandatory reduction is required, a program’s effectiveness can be judged directly by water billings. In these cases, targeted results must be met, and even reluctant customers will, on the whole, meet the goals. Specific methods to evaluate effectiveness of water conservation programs to be employed by PWD are:

1. Monitoring of Metered Water Usage – This will determine how much has been used. Compiling statistics to track usage of customer groups to determine trends is currently being done through the water billing computer system. Meter readings/billings can be compared and analyzed to determine the effectiveness of conservation for all customer classes.

2. Monitoring Production Quantities – In normal water supply conditions, production figures are recorded daily by the District’s automated system. The Water Production Supervisor and the Production Lead monitor the accuracy of the monthly production totals. The totals are incorporated into the monthly water supply report to the State by the Water Treatment Supervisor.

To verify that conservation reduction goals are being met, production and metered usage reports will be provided to General Manager during each stage of the conservation period. Water production figures will be compared to previous year production figures for the same time period to ascertain if conservation goals are being reached. Results will be posted on the Palmdale Water website, as appropriate.

Additional actions available to PWD include:

1. Transition of remaining customer water meters to "smart meters" and investment in automated system to improve customer interface to allow more timely monitoring by customer of water use patterns.

2. Provide incentives to property owners to install individual meters or sub-meters in multi-family structures to for resident/property owners to track water usage.

Table 5-1 lists specific monitoring and reporting methods for each shortage stage that can be used to measure the effectiveness of reducing the shortage gap. As the stages progress into a greater percent supply reduction needed, the monitoring and reporting will increase in frequency, intensity, and resources.

Table 5-1: Monitoring and Reporting to Support Shortage Response Actions

Shortage Stage (% supply reduction)	Monitoring and Reporting Methods (How to measure effectiveness of reducing the shortage gap)
I (Up to 10%)	- Water-Use Monitoring Mechanisms - Prepare and review monthly water use reports
II (Up to 20%)	All Previous Monitoring and Reporting Methods AND: - Run and review monthly water use reports
III (Up to 30%)	All Previous Monitoring and Reporting Methods AND: - Run and review monthly water use reports
IV (Up to 40%)	All Previous Monitoring and Reporting Methods AND: - Run and review monthly water use reports
V (Up to 50%)	All Previous Monitoring and Reporting Methods AND: - Run and review monthly water use reports
VI (Up 50% of More)	All Previous Monitoring and Reporting Methods - Run and review monthly water use reports

Section 6: Enforcement

The District has the power and authority to implement and enforce its shortage response actions including mandatory water conservation measures within its boundaries per Resolution No. 09-04, which was adopted in March 2009.

Enforcement actions for violations of water conservation measures are summarized in Table 6-1. PWD customers are encouraged to report water conservation violations through use of the PWD hotline.

Table 6-1. Penalties for Customer Violations

Violation Level	Penalties or Charges
1st Violation	The customer shall be notified in writing. The notice shall include a warning that further violations could result in stricter penalties.
2nd Violation	A 2nd violation is punishable by a fine of up to $50.
3rd Violation	A 3rd violation is punishable by a fine of up to $250.
4th Violation	A 4th violation is punishable by a fine of up to $500.
5th Violation	A 5th violation may result in termination of service and a $1,000 reconnection fee
Violation Assessment Period	Any violations occurring within twelve months of each other will be considered consecutive and result in escalating penalties. The period for assessing. consecutive penalties may be extended beyond 12 months by resolution of the Board.

In accordance with the PWD Water Waste policy, a receipt of notice regarding a claim of water waste or misuse, the Customer shall have five days to file a request for reconsideration with the General Manager, and fifteen days after the General Manager's decision to file a written appeal with the Board. A hearing on the appeal will be conducted in the next Board meeting following the appeal, with the Board's decision from the hearing designated as final and conclusive.

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Section 7: Financial Consequences of Actions during Shortages

Water providers face significant financial challenges during droughts. During periods of reduced consumption, revenue from water sales decline while expenses remain relatively constant. A reduction in construction activities can also reduce water service connection fees collected. At the same time, as consumption decreases, some expenditures are expected to increase, including staff costs for community education, enforcement of ordinances, monitoring and evaluation of water use, and drought planning. Operations and maintenance costs may also increase because of the need to identify and quickly repair all water losses.

PWD recognizes the financial impacts of reduced customer deliveries and connections during droughts. The following sections describe potential revenue reductions, expense increases, mitigation actions and the cost of compliance with reducing residential water use during drought.

7.1.1 Revenue Impacts of Reduced Sales and Increased Costs

Currently, about 55 percent of PWD'S O&M costs are covered by fixed revenues. As a result, water conservation efforts can significantly impact revenues and the ability to cover fixed, non-variable costs.

Reductions in potable water use could result in an operating shortfall for the Potable Water Enterprise. While operating expenses are reduced with lower sales, fixed costs cannot be fully recovered when there are significant reductions in sales, thereby resulting in a net operating loss. PWD has planned for this shortfall by creating a reserve fund.

In the case of future water use reductions resulting from the implementation of the PWD WSCP, PWD would likely experience impacts to operating revenue and would draw as necessary and as possible from reserves. In addition, one of the objectives of the budget-based tiered rate structure implemented on January 1, 2020 is to improve revenue stability. Therefore, while revenue would inevitably fluctuate with water use reductions, PWD has established appropriate means to manage these impacts with use of drought surcharge, as indicated in the 2019 Financial Planning report. Future or continued reductions in consumption would ultimately cause a rate structure adjustment that would generate enough revenue to fund operations without drawing from reserves. Table 7-1 presents an amended summary of findings from the 2019 Financial Planning Report with respect to revenue impacts from demand reduction, based on data from 2020.

Table 7-1. Revenue Impacts of Reduced Water Demand

Demand Reduction	Annual Revenue Reduction ($ million)	State Water Purchase Offset ($ million)	Ancillary Costs ($ million)[1]	Net Cost of Compliance ($ million)[4]
10%	-$0.71	+$0.38	$0.23	-$0.10
20%	-$1.42	+$0.76	$0.25	-$0.41
30%	-$2.14	+$1.13	$0.28	-$0.73
40%	-$2.85	+$1.51	$0.27	-$1.07
50%	- $3.56	+$1.88	$0.26	-$1.42

1. Estimated as a percent of Operations and Maintenance expenses to reflect increased costs for expanded public outreach campaigns, increased meter reading, operational and administrative support during each drought stage to implement demand reduction actions.
2. Calculated sum of annual revenue reduction plus reduced imported water purchased plus ancillary costs.

7.1.2 Mitigation Actions to Address Revenue Reductions

A reduction in water revenue could be mitigated by use of the established reserve fund, deferral, or avoidance of capital fund expenditures, use of less costly water supplies (if possible), and implementation of drought surcharge rates. This would meet short-term cash flow needs, although it should only be considered on a short-term basis.

A summary of measures to overcome revenue and expenditure impacts is provided in Table 7-2.

Table 7-2. Measures to Overcome Revenue Impacts During Shortage

Measure	Summary of Effects
Use of Reserve Funds	Use of reserves may provide short-term rate stabilization but would require delays in capital expenditures and rebuilding of reserves after the water shortage.
Re-evaluate Capital Expenditure Plans	Delay major construction projects for facilities as well as upgrades and replacements.
Shift Water Sources to Less Costly Supplies if Possible	Reduce costs associated with purchase, treatment, and distribution of water.
Drought Surcharge Rates	Increase revenue.

Drought surcharges are recommended based on the Board Resolution No 09-04 and are summarized in the table below.

Table 7-3. Proposed Drought Surcharges

Drought Mandate	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
20% Surcharge	$ 0.35	$ 0.38	$ 0.40	$ 0.42	$ 0.45
30% Surcharge	$ 0.54	$ 0.58	$ 0.61	$ 0.65	$ 0.69
40% Surcharge	$ 0.79	$ 0.84	$ 0.89	$ 0.94	$ 1.00

Source: PWD Financial Planning, Revenue Requirements, Cost of Service, and Rate Setting Analysis, 2019

7.1.3 Financial Consequences of Limiting Excessive Water Use

Per the California Water Code Section 365 et al., retail water suppliers are required to prohibit or discourage excessive water use. Reporting this is not a required part of the UWMP; however, Water Code Section 10632(a)(8)(C) requires the financial consequences of these actions be reported as part of the UWMP.

Water Code Section 367 states that there are three types of drought emergencies:

- Declared statewide drought emergency
- When a supplier implements its mandatory reductions per their WSCP
- A declared local drought emergency

Water Code Section 366 states that a retail water supplier must prohibit excessive use through one of two strategies:

- Rate structure. Specifically, a rate structure that includes block tiers, water budgets, or rate surcharges over and above base rates for excessive water use by a residential water customer.
- An excessive water use ordinance, Specifically an ordinance that includes a procedure to identify and address excessive water use by metered single-family residential customers and customers in multiunit housing complexes in which each unit is individually metered or submetered and may include a process to issue written warnings to a customer and perform a site audit of customer water usage prior to deeming the customer in violation.

PWD already has in place budget-based rates that discourage excessive water use. Should a drought emergency occur, PWD would already have the necessary processes in place to discourage excessive use. As discouraging excessive use is already a part of PWD's normal operations, the financial consequences of prohibiting excessive use would be minimal.

References

American Water Works Association, 2011. Drought Preparedness and Response. Manual of Water Supply Practices, M60.

American Water Works Association, 2008. Forecasting Urban Demand. Second Edition.

Palmdale Water District. 2019. Financial Planning, Revenue Requirements, Cost of Service, and Rate Setting Analysis. October.

Virginia Polytechnic Institute and State University Blacksburg, Virginia, 2006. The Effectiveness of Drought Management Programs in Reducing Residential Water-Use in Virginia.

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Appendix A

Resolution Adopting the 2021 Urban Water Management Plan and Water Shortage Contingency Plan

PALMDALE WATER DISTRICT
RESOLUTION NO. 21-11

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE PALMDALE WATER DISTRICT ADOPTING, DIRECTING FILING OF, AND IMPLEMENTING THE PALMDALE WATER DISTRICT 2020 URBAN WATER MANAGEMENT PLAN, THE 2015 URBAN WATER MANAGEMENT PLAN AMENDMENT, AND THE 2020 WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the California Legislature enacted Assembly Bill 797 during the 1983-1984 Regular Session of the California Legislature (Water Code Section 10610 et.seq.) known as the Urban Water Management Plan Act (the Act).

WHEREAS, the California Water Code Section 10632 requires that every urban water supplier shall prepare and adopt a Water Shortage Contingency Plan (WSCP) as part of its Urban Water Management Plan (UWMP); and

WHEREAS, the WSCP is consistent with the California Water Code Sections 350 through 359 and Section 10632 and guidance provided by the California Department of Water Resources Urban Drought Guidebook; and

WHEREAS, the Act mandates that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually prepare, and every five (5) years thereafter update, its UWMP, the primary objective of which is to plan for the conservation and efficient use of water.

WHEREAS, the 2020 UWMP, 2015 UWMP amendment, and the 2020 WSCP (together known as the Plans) must be adopted by July 1, 2021 and filed with the California Department of Water Resources, the California State Library, and the City of Palmdale within thirty days of adoption; and

WHEREAS, the Palmdale Water District prepared and filed a UWMP with the California Department of Water Resources in December 1985, December 1990, December 1995, December 2000, December 2005, December 2010, and December 2015; and

WHEREAS, the Act further requires that the adopted UWMP's and WSCP be available for public review during normal business hours for thirty (30) days following its submission to the Department of Water Resources; and

WHEREAS, as an urban water supplier providing water service to over 117,000 customers, Palmdale Water District is subject to the Act and has, therefore, prepared and circulated for public view a draft 2020 UWMP, a draft 2015 UWMP Addendum, and a draft 2020 WSCP in compliance with the requirements of the Act, and a properly noticed public hearing regarding the proposed Plan was duly held by the Palmdale Water District on June 14, 2021.

NOW, THEREFORE, BE IT RESOLVED by the Board of the Directors of the Palmdale Water District as follows:

1. The 2020 Urban Water Management Plan, the 2015 Urban Water Management Plan Amendment, and the 2020 Water Shortage Contingency Plan are hereby approved and adopted.

2. The General Manager is hereby authorized and directed to file the Plans with the California Department of Water Resources, the California State Library, and the City of Palmdale within thirty days of adoption in accordance with the Act.

3. When required by conditions contained in the Plans, the General Manager is authorized to declare a Water Shortage Emergency and to implement water conservation programs as detailed in the Plans, including recommendations to the Board of Directors regarding necessary procedures, rules, and regulations to carry out effective and equitable water conservation programs.

4. The General Manager and staff are hereby further authorized and directed to take such other and further actions as may be reasonably necessary to carry out the purposes and intent of the Plan.

PASSED AND ADOPTED at the Regular Meeting of the Palmdale Water District Board of Directors held on June 14, 2021.

Gloria A. Dizmang

GLORIA DIZMANG, President,
Palmdale Water District Board of Directors

ATTEST:

Kathy MacLaren-Gomez

KATHY MAC LAREN-GOMEZ, Secretary,
Palmdale Water District Board of Directors

APPROVED AS TO FORM:

Aleshire & Wynder, LLP, General Counsel

Appendix B

Palmdale Waste of Water Policy

APPENDIX O

WASTE OF WATER POLICY

Palmdale Water District is engaged in the production, transmission, storage and distribution of water to its Customers in accordance with California law.

California law prohibits the waste or unreasonable use of water and requires that the District take all appropriate actions to prevent such waste and unreasonable use of this finite resource.

Water waste includes but is not limited to:

- Application of potable water to outdoor landscapes in a manner that causes runoff.
- Failure to repair water leaks or to adjust sprinkler overspray in a timely manner.
- Hosing of hardscape surfaces, except where health and safety needs dictate.
- The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system.
- Irrigation with potable water of ornamental turf on public street medians.
- Watering of outdoor landscapes within 48 hours of measurable rainfall.
- Car washing and outside cleaning activities except when performed with buckets and automatic hose shutoff devices.
- The serving of drinking water other than upon request in eating or drinking establishments.
- Failure of operators of hotels and motels to 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.)
- Inefficient use of water for construction purposes.
- Irrigation with potable water outside of newly constructed homes and buildings not delivered by drip or microspray is prohibited.

Categories of Water Waste:

The District recognizes that water waste can vary significantly in severity and for this reason will classify and deal with three levels of water waste.

Level 1 Water Waste:

This is the least severe category of water waste which includes any violation of the Water Waste Policy and any other form of water waste that leads to minor but avoidable water loss. Examples of this would be overspray from improperly adjusted sprinklers or small leaks leading to wetting of the sidewalk.

Penalties for Level 1 Water Waste:

Penalties for Level 1 waste violation will be an initial warning. Failure to repair the violation will result in a $50 fine. An additional new $50 fine will be assessed if the follow up inspection shows that the violation is unrepaired. Follow up inspection will occur no more frequently than once every 14 days. If a Level 1 water waste violation continues unrepaired for greater than 60 days, then the District may elevate the penalties to Level 2 fines as described below.

Level 2 Water Waste:

This category includes any form of water waste where water is visibly and measurably flowing off the property. Examples of this would be a sheared off sprinkler or an irrigation system that is stuck on. Follow up inspection will occur no more frequently than once every 7 days.

Penalties for Level 2 Water Waste:

The penalties will mirror the penalties found in the Water Shortage Contingency Plan. These penalties are currently as follows:

1st Notice of Violation- The customer shall be notified in writing. The notice shall include a warning that further violations could result in stricter penalties.

2nd Notice of Violation- is punishable by a fine of up to $50.

3rd Notice of Violation- is punishable by a fine of up to $250.

4th Notice of Violation- is punishable by a fine of up to $500.

5th Notice of Violation- may result in termination of service.

Level 3 Water Waste:

This category includes any form of water waste where water leaving the property appears uncontrollable or poses a threat to public safety. Examples of this would be a broken water line flowing unrestrained off the property or water leaving the property causing a public safety threat due to icing or flooding.

Penalties for Level 3 Water Waste:

Level 3 water waste will result in the shutdown of service until the repair has been successfully accomplished. Repeat incidences of severe water waste will mirror the penalties found in the Water Shortage Contingency Plan.

District Process:

1. Upon notification or observation of waste or misuse of water, the District shall:

   (a) Make a photographic record of such activity;

   (b) Provide notice to the Customer in writing or by means of a door tag; and

   (c) Log the warning on the Customer's service record.

2. In the event of a recurring violation, the District shall:

   (a) Assess the appropriate fine upon the Customer for each notification of violation occurring after the warning has been given;

   (b) Give notice to the Customer in writing that if such waste or misuse continues, the Customer may be subject to increased penalties up to and including disconnection of service.

3. Upon determination that a violation is still unresolved and a final notice needs to be issued, the District shall:

   (a) Give written notice to the Customer that disconnection of the service will occur within five (5) working days of the date of the notice;

   (b) Disconnect the Customer's service after the appropriate time has been allotted; and

   (c) Charge the Customer a disconnection charge for waste or misuse of water as set forth in Appendix D and a turn-on fee as set forth in Appendix D if service is later restored. Service will be restored only when the Customer has provided evidence satisfactory to the District that waste and unreasonable use of water will no longer occur.

The District recognizes that there may be mitigating or intervening circumstances that bear upon a Customer's apparent misuse of water. Upon receipt of any notice regarding purported misuse or waste of water, the Customer shall have five (5) working days within which to file a written request for reconsideration with the General Manager. If the Customer is not satisfied with the General Manager's decision, the Customer shall have fifteen (15) days after the General Manager's decision within which to file a written appeal with the Board. The Board shall conduct a hearing on the appeal at the next Board meeting immediately following the appeal. The Board's decision following such hearing shall be final and conclusive.

ADOPTED BY THE BOARD OF DIRECTORS OF PALMDALE WATER DISTRICT AT A REGULAR MEETING HELD OCTOBER 11, 2017

Appendix C

Seismic Evaluation Report

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Seismic Risk Evaluation and Mitigation Report

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Prepared for

Palmdale Water District
2029 East Avenue Q
Palmdale, CA 93550

KJ Project No. 2044225*00

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Section 1: Draft Seismic Risk Analysis

1.1 Overview

The Act requires urban water suppliers to evaluate potential seismic risk to the facilities in their system and produce a mitigation plan. This section describes the review of the of the existing documentation and preliminary evaluation seismic risk the Palmdale Water District's (PWD) existing facilities. This section also provides recommendations for mitigation of the existing risks. Current structural design practice is to design structures for ground motion with a 2.5% probability of exceedance in any 50-year period. This design earthquake is highly dependent on conditions at any given location. Earthquake magnitude is an estimate of the total energy released by a given earthquake and cannot be directly translated into the design earthquake used for structural design. However, The U.S Geological Survey estimates that there is a 99% chance that California will experience a 6.7 magnitude earthquake within 30 years. The Current design earthquake has a lower probability of occurring than an earthquake of similar magnitude to the 1994 Northridge Earthquake, 6.7.

The facilities review as part of this assessment include approximately 29 well sites, 14 booster pump station, and 19 steel water storage tanks, one underground concrete water storage tank, Lake Palmdale, and Little Rock Reservoir. The facilities described in this report were constructed between 1965 and the present day. There are significant gaps in the construction documentation of many of these facilities. Final seismic risk mitigation planning will require site visits by a Structural or Civil Engineer experienced in design of water treatment facilities to evaluate the existing conditions. Where possible an initial determination of the seismic loads at the facilities has been determined in accordance with the 2010 Edition Minimum Design Loads Associate for Buildings and Other Structures (ASCE 7-10) using the web-based Hazard Maps by the Applied Technology Council (ATC). The 2010 edition was used in this stage because ASCE 7-16 as referenced in the current California Building Code (CBC) requires site specific geotechnical investigations for most conditions and structures. When implementing the final mitigation recommendations, a geotechnical investigation will be required for most of the Palmdale Water District's facilities.

1.2 Water Storage Tank Evaluation Summary

The seismic evaluation of SCV Water was conducted by applying the seismic design provision of the 2011 edition of Welded Carbon Steel Tanks for Water Storage by the American Water Works Association (AWWA D100-11). SCV Water currently operates over 90 steel water storage tanks. For our analysis we were provided the diameter, height to the overflow and maximum capacity of the storage tank. Using this information, ASCE 7-10 seismic parameters, and the seismic provision of AWWA D100-11, we determined the seismic loads, sloshing wave height, and anchorage requirements of SCV Water's storage tanks. Final design of welded and bolted steel water storage tanks is typically conducted by specialty contractors and submitted during construction. The construction drawings rarely indicate the final plate thicknesses, location and size of columns, size and location of anchors or other significant aspects of design beyond size and design criteria. Further field investigations will be required quantify further risk.

Storage tanks build prior to 1984 are unlikely to be compliant with current building standards are unlikely to have been designed for lateral loads due to seismic events. Storage tanks built between 1984 and 2011 were probably designed with seismic loads however they may not be designed to withstand seismic loads determined in accordance with the current building code. Those storage tanks designed after 2011 are likely designed to meet current building code requirements.

Table 1: Tank Design Use Group

AWWA D100-11 Design Use Group and Seismic Importance Factor		
Use Group	*Importance Factor, I_e	Description
I	1	Tanks that provide service to facilities deemed essential for post-earthquake recovery and essential to the life, health, and safety of the public, including post-earthquake recovery
II	1.25	Tanks that provide service to facilities that are deemed important to the welfare of the public.
III	1.5	All Other

*Importance factor is used to amplify loads from earthquakes.

16 of the existing storage tanks require anchorage to the foundations. Neither the PWD standard tank details nor construction documents indicate that these tanks are anchored. The remaining storage tanks will experience uplift due to seismic loads but do not require anchors at the foundation. The sloshing wave height and required freeboard varies between nine and 16 feet in height. In most cases this exceeds the existing freeboard which is typically three feet from the maximum operating height to the roof structure. Record drawings of the underground concrete storage tank were not available for review however, the tank was designed and build in 1994 and built in accordance with ACI 350, Code Requirements for Reinforced Concrete Structures. Investigations should be conducted to determine what the existing conditions of the structure are and determine if any deficiencies may exist.

Table 2: Anchorage and Freeboard Requirements.

							AWWA D100-11 Welded Carbon Steel Tanks Chapter 13 Seismic Design[1,2]											
Tank Site	Address	Tank Details						Table 28	13.2.1	Table 24	Eqn 13-36		Eqn 13-52	Table 29		Eqn 13-57		
		Date Built	*Dia*	*Size*	*Top of Knuckle*	*Overflow Height*	*Freeboard Assumed to be 3 feet unless drawings indicate otherwise*	*Ri 3 if anchored 2.5 if unanchored*	*Seismic Use Group* [3]	*I_E, assume that all tanks are Seismic Use Group III*	**Overturning Ratio, J**	**Anchor Requirements**	**Sloshing Wave Height (d), ft**	**Minimum Required Freeboard (D), ft**	**Actual Freeboard (Roof Height-Overflow)**	**Allowable Lateral Load, V_{allow} (kip)**	**Total Lateral Seismic Load, Vt (Kip)**	**Sliding Check**
3 MG Tank Site	850 East Avenue S	1960	124	3,000,000	Unknown	34	3	2.5	iii	1.5	2.54	Provide Anchors	16.65	16.65	3	12851	7225.517287	OK
5 MG Tank	2404 Old Nadeau Road		160	5,000,000	Unknown	20	3	2.5	iii	1.5	0.57	Tank Is Stable	10.08	10.08	3	12338	3533.246096	OK
6MG	641 East Ave S	1999	206	6,000,000	Unknown	24	3	2.5	iii	1.5	0.64	Tank Is Stable	9.58	9.58	3	24349	6291.49113	OK
25th Street	26496 Cemetery Road	1976	106	2,000,000	Unknown	30	3	2.5	iii	1.5	2.23	Provide Anchors	15.53	15.53	3	8304	4860.105574	OK
		1967	154	4,000,000	Unknown	30	3	2.5	iii	1.5	1.51	Uplift but Stable	14.15	14.15	3	17380	7130.096891	OK
45th Street	36510 45th St East	1988	130	3,000,000	Unknown	30	3	2.5	iii	1.5	1.77	Provide Anchors	14.95	14.95	3	12488	5845.275811	OK
		1990	150	4,000,000	Unknown	32	3	2.5	iii	1.5	1.74	Provide Anchors	14.33	14.33	3	17687	7540.066766	OK
		1990	150	4,000,000	Unknown	32	3	2.5	iii	1.5	1.74	Provide Anchors	14.33	14.33	3	17687	7540.066766	OK
47th Street	35645 47th St East	1967	106	2,000,000	Unknown	30	3	2.5	iii	1.5	2.24	Provide Anchors	15.64	15.64	3	8301	4879.725022	OK
		1990	132	3,000,000	Unknown	30	3	2.5	iii	1.5	1.87	Provide Anchors	16.32	16.32	3	12801	6303.069693	OK
50th Street	5001 East Ave, T-8	2007	150	4,000,000	Unknown	30	3	2.5	iii	1.5	1.55	Provide Anchors	14.22	14.22	3	16514	6902.168294	OK
		2007	150	4,000,000	Unknown		3	2.5	iii	1.5	1.55	Provide Anchors	14.22	14.22	3	16514	6902.168294	OK
Ana Verde	36800 Tovey Avenue	1963	40	300,000	Unknown	32	3	2.5	iii	1.5	5.44	Provide Anchors	9.95	9.95	3	1363	1351.046084	OK
El Camino Lower	36809 El Camino Dr.	1988	106	2,000,000	Unknown	32	3	2.5	iii	1.5	2.42	Provide Anchors	15.24	15.24	3	8916	5163.807319	OK
El Camino U.G[4]	36336 El Camino Road	1994	104	1,500,000	Unknown	26												
El Camino Upper	33030 Ridge Route Rd	1963	40	300,000	Unknown	32	3	2.5	iii	1.5	5.00	Provide Anchors	7.22	7.22	3	1371	1262.693411	OK
Walt Dahlitz	115 East Avenue S	1993	104	1,500,000	Unknown	31	3	2.5	iii	1.5	1.80	Provide Anchors	9.80	9.80	3	8455	3868.50122	OK
Well 14	36401 20th ST East		27	100,000	Unknown	22	3	2.5	iii	1.5	4.80	Provide Anchors	6.24	6.24	3	435	399.685968	OK
Well 18 and 19	4640 Barrel Springs Road	1963	22	41,000	Unknown	30	3	2.5	iii	1.5	11.47	Provide Anchors	8.06	8.06	3	387	488.3004155	Needs Anchors
Well 5	1036 Barrel Spring Road	1963	30	1,463,945	Unknown	22	3	2.5	iii	1.5	5.05	Provide Anchors	9.29	9.29	3	526	561.5710227	Needs Anchors

1. Design spectral response acceleration parameters, S_{D1} and S_{DS}, have been determined using the Applied Technology Council's (ATC) web-based hazard maps in accordance with the American Society of Civil Engineers Standard 7, Minimum Design Loads for Buildings and Other Structures (ASCE 7-10)

2. The Design spectrum for impulsive components, Sai and the Design Spectrum for convective components, Sac have been determined in accordance with Chapter 13 of the AWWA D100-11, Welded Carbon Steel Tanks for Water Storage. These parameters are expressed as a percentage of the acceleration due to gravity, g.

3. Minimum required freeboard is equal to the sloshing wave height for Use Group III and may be reduced for Use Group I and II

4. AWWA D100 calculations do not apply to the El Camino Underground tank. Construction drawings are not available to perform an analysis currently.

To determine if the storage tank walls and roof systems are adequate to resist potential seismic loads, field visits will be required to determine the existing plate thicknesses and structural sections used in construction. Further analysis will then be performed determine the capacity of the storage tank structural system. For those storage tanks that required anchors, greater freeboard, or do not have the structural capacity to meet demand we recommend reducing the operating capacity and overflow height to reduce the seismic demands on the structures. Water storage tanks designed in accordance with AWWA D100 and D103 can be classified in one of three seismic use groups as described in Table 1. The initial analysis has been conducted assuming all of the storage tanks are in Use Group III, essential for post-earthquake recovery and essential to the life, health, and safety of the public, including post-earthquake fire suppression.   For those facilities that are not required for post-earthquake recovery, the use group may be designated as Use Group II, tanks that provide direct service to facilities that are teemed important to the welfare of the public. In rare cases they may be assigned to Use Group I, those that are not essential to the health and safety of the public. This will reduce the design seismic load by twenty-five percent and fifty percent.

Field investigation are necessary to determine the structural capacity of the existing storage tanks.   Thickness of the tank shells and roofs will be determined using an ultrasonic thickness gauge, the size number and location of columns will be determined. In our experience the most common mode of failure for steel storage tanks is buckling of the lowest shell plate. Due do relatively significant consequences in the event of failure, we recommend that the steel tanks be given high priority for further investigation and mitigation efforts.

1.3 Source Water Supply

The District's source water consists of the Palmdale Lake, Little Rock Reservoir and more than 20 well sites. The Little Rock Lake Reservoir under the jurisdiction of the California Division of Safety of Dams. The Division of Safety of Dams inspects the Little Rock Reservoir Dam on an annual basis and periodically reviews the stability of dams considering improved design approaches. The Little Rock Dam represents minimal risk to the District due to the inspection and review by the Division of Damn Safety. The Little Rock Dam Recreation Areas include several small buildings and structures. These structures pose negligible risk to the public in the event of an earthquake. The facilities at the Little Rock Reservoir and Palmdale Lake are summarized in Table 3 below.

There are several facilities at Palmdale lake including a concrete box culvert, concrete spillway, and drainage channel. These structures consist of relatively minor reinforced concrete at or below grade. The primary risk to these structures is the potential for liquefiable soils in the area. In the event of failure, they pose a relatively minor risk to the public, however geotechnical investigations should eventually be conducted to determine susceptibility to earthquake damage.

The typical well site consists of vertical turbine pumps embedded directly into the soil and represent minimal risk of failure during or after an earthquake. Many of the well sites are co-located with booster pumpstations and tank sites. Site visits by a qualified civil or structural engineer should be conducted to verify the existing conditions at each site. Above ground piping is generally rigid and represents minimal risk of failure during an earthquake. It is typical for the piping systems at older well sites to lack support for lateral loads due to earthquakes. The inspections should take note of any pipe supports that are not anchored into concrete foundation. Where available, record drawings typically indicate that chemical storage tanks, generators and other equipment is anchored to foundations. The current building code requires anchors for steel storage tanks for liquids to fail in a ductile manner. It is unlikely that the anchorage for the existing facilities meet this requirement. The installations of older facilities are unlikely to follow current standard practices. The well sites are summarized in Table 4. Below. Facilities have been assigned a relative risk between one and 10. This assessment is subjective and intended to assist the district in prioritizing further investigation and mitigation. The factors increasing relative risk include the age of structures, lack of necessary record drawings, noted deficiencies.

Table 3: Miscellaneous Facilities

Site	**Address**	**Facilities**				
		Date Built	***Generator***	***Structural Record Drawings***	***Structures***	***Noted Risk/Deficiences***
Little Rock Canal	Mulitple	1995	No	1995	Cast-in-Place Concrete Canal	None Noted, subgrade reinforced concrete walls designed and built in 1995.
Little Rock Dam and Reservoir	33883 Cheseboro Road	1992	No	1992	Concrete buttressed earthwork Dam Reinforced Concrete Vault	Under the jurisdiction of the Bureau of Dam Safety, yearly inspection, and periodic review for structural soundness.
Little Rock Dam Recreation Area 1	Adjacent to Little Rock Reservoir	1997	No	1997	Walk-in campsite toilets, wood framed roof over CMU and Gazebo	None Noted.
Little Rock Dam Recreation Area 2	Adjacent to Little Rock Reservoir	1996	No	1996	N/A	None Noted
Little Rock Dam Recreation Area 3	Adjacent to Little Rock Reservoir	1994	No	1994	Cantilever column shelter structures	None noted
Little Rock Dam Recreation Area 4	Adjacent to Little Rock Reservoir	1994	No	1994	None	None Noted
Little Rock Dam Recreation Area 5	Adjacent to Little Rock Reservoir	1994	No	1994	Walk-in campsite toilets, wood framed roof over CMU	None Noted
Little Rock Dam Recreation Area 6	Adjacent to Little Rock Reservoir	1994	No	1994		None Noted
Little Rock Sluice Gate and Siphon	Adjacent to Little Rock Reservoir	Modifications 1998	No	1998	Cast-in-place concrete siphon structure	None Noted
Palmdale Lake Box Culvert	South East of Palmdale Lake	1992	No	1992	Cast-in-place box culvert	None Noted
Palmdale Lake Spillway	North shore of Palmdale Lake	1988	No	1988	Cast-in-place Concrete spillway	Subgrade should be investigated by a Geotechnical Engineer for potential erosion or liquefiable soils.
Palmdale Lake Drainage Channel	Adjacent to Palmdale Lake	1992	No	1992	Concrete lined channel	None noted

Table 4: Well Site Summary

Well Site	Address	Facilities										
		Date Built	*Building*	*Fuel Storage*	*Chemical Storage*	*Pump HP*	*Capacity (GPM)*	*Structural Record Drawings*	*Roof Type*	*Lateral System*	*Noted Risk/Deficiences*	**Relative Risk**[1]
2A	39400 20th St East	1968	Yes		NaOCl	125	265	1968	Steel deck over steel and wood framing	Solid grouted CMU and wood studs	Potential irregularity due to the mixed resisting System	4
3A	2163 East Ave P-8	1960	Yes	Propane	Salt	500	1,551	1992		Solid Grouted CMU with wood studs	Potential irregularity due to the mixed resisting System	3
4A	2475 East Ave P-8	1970	Yes		Salt/ NaOCl	200	778	Not Available				3
5	1036 Barrel Springs Rd	1965	yes			5	99	Not Available	Steel Deck over steel framing	Steel Braced Frame Steel Moment Frame	Rod Bracing is prone to buckling. Columns are pinned with (2) at shallow embedment	8
6A	39455 10th St East	1983	Yes		NaOCl	125	265	Not Available		Steel moment Frame	Drawings were inadequate to determine specific risks	8
7A	39395 25th St East	1985	Yes		Salt/ NaOCl	500	1,589	Not Available	Steel Deck over steel framing	Pre-engineered metal building	Inspection is required to determine specific vulnerabilities.	8
8A	2200 East Ave P	1987	Yes		NaOCl	600	2,024	Not Available			Drawings were inadequate to determine specific risks	8
10	3701 East Ave P-8	1956	Yes		NaOCl	100	254	1956	Steel Frame	Steel Framed	Drawings were inadequate to determine specific risks. The building is 65 years	8
11A	39501 15th St East	1963	Yes				1,161	1999	Wood deck over 2x wood framing	Wood stud shear wall	None	3
14[2]	39401 20th St East	1965	Yes		Salt	250	1,188				None Noted	3
15	1003 East Ave P	1960	Yes		Salt/ NaOCl	590	998	1999	Wood deck over wood framing	Wood stud shear walls	None Noted	1
16	4125 East Ave S-4	1960	Yes		NaOCl	40	150	Not Available			Drawings were inadequate to determine specific risks	7
17	718 Denise Ave	1966	Yes			20	110	1996	Wood deck over wood framing	Wood stud shear walls	Thin floor slab may provide inadequate anchorage	3
18 and 19[2]	4640 Barrel Springs Rd	1954	Yes		NaOCl	5	96					4
		1961					127					
20	5680 Pearl Blossom Hwy	1973			NaOCl	60	227	2001	Wood deck over wood framing	Wood stud shear walls	Thin floor slab may provide inadequate anchorage	3
21	36525 52 St East	1973			NaOCl	30	227	1999	Wood deck over wood framing	Wood stud shear walls	Thin floor slab may provide inadequate anchorage	1
22	5401 East Ave S	1974			None	75	347	1999	Wood deck over wood framing	Wood stud shear walls	Thin floor slab may provide inadequate anchorage	1
23A	2202 East Ave P-3	1977	Yes		NaOCl	250	743	1999	Wood deck over wood framing	Wood stud shear walls	Thin floor slab may provide inadequate anchorage	1
25	3750 70th St East	1989	Yes		Salt/ NaOCl	125	514	1992	Wood deck over wood framing	Solid CMU	Thin floor slab may provide inadequate anchorage	2
26	4701 Katrina Place	1989	Yes			50	304	1992	Wood deck over wood framing	Wood stud shear walls	Thin floor slab may provide inadequate anchorage	2
29	37700 67th st East	1989	Yes		NaOCl	40	250	1989			Drawings were inadequate to determine specific risks	
30	7392 East Ave R	1989	Yes		Salt/NaOCl	150	498	1990	Wood deck over wood framing	Solid CMU	Thin floor slab may provide inadequate anchorage	3
32	37301 35th St East	1989	Yes		NaOCl	60	293	1992	Wood deck over wood framing	Wood stud shear walls	Thin floor slab may provide inadequate anchorage	2
33	7160 East Ave R	1991	Yes		Salt/ NaOCl	75	418		Wood deck over wood framing	Solid CMU	Thin floor slab may provide inadequate anchorage	2
35	36549 60th St East	1991	Yes		Salt/ NaOCl	75	444		Wood deck over wood framing	Solid CMU	Thin floor slab may provide inadequate anchorage	2

1. Relative risk is a subjective measure based on risk to life and post-earthquake operation intended to assist in the District to prioritize further investigation
2. See Table 5 for building structures.

1.4 Booster Pump Stations

Pump stations consist of above grade or below grade structures with multiple pumps wet wells, and additional equipment. Like steel water storage tanks older facilities are less likely to be designed for lateral loads equivalent to modern building standards. Those designed and built later than 2000 are unlikely to pose a substantial risk in the event of an earthquake. Site visits should verify that the existing equipment is anchored to the foundations and walls, and that there is an adequate load path to transfer lateral loads from the roof and walls to the foundations. The booster pump station facilities are summarized in Table 4 below.

1.5 Well and Booster Pump Buildings

Where record drawings are available, they indicate that most of the buildings are relatively small one-story structures. The structural systems include reinforced concrete masonry unit shear walls, wood stud shear walls, and steel framed walls. The roof structures are wood or metal diaphragms over steel or wood framing. The 3 MG Tanks and 5 MG Tank pump stations includes two buildings with a mixed structural system. This may introduce irregularities in performance due lateral earthquake loads. Many buildings have relatively thin slabs. While this is common in earlier designs, the current building code typically requires greater depth of embedment for equipment anchors. The building structure at Well Site 10 appears to be a steel tube framed structure of a type that would no longer be permitted by the building code. The available documentation was not sufficient to fully analyze the system.

1.6 Mitigation Planning

The District should identify which facilities are required to operate immediately following an earthquake, are required for the health and safety of the public, and those that are not either. The highest priority should be given to those facilities that supply fire suppression systems, including water storage tanks and transmission system. The first step in mitigating the risks identified in this report will be to arrange for a civil or structural engineer experienced in design of water treatment and distribution systems to inspect the Districts facilities. Once the District and Kennedy Jenks has identified the most critical and at-risk facilities, the District should consult with a geotechnical engineering firm to perform site investigations of the most crucial facilities to allow a qualified engineer to perform a more accurate and detailed analysis and provide the most appropriate mitigation efforts.

For those storage tanks that require anchorage and or have insufficient freeboard height to accommodate wave action the district may take immediate action to reduce the risk. As shown in Table 2, the District may choose to reduce the operational capacity to prevent instability, increase freeboard, and reduce the sloshing wave height. The District may determine that some of the storage tanks are not required for immediate post-earthquake recovery and do not pose a substantial risk to human life. In those cases, the Seismic Use Group will be reduced to reduce the required freeboard and demands due to seismic loads. This may result in no further action being required. Kennedy Jenks recommends providing anchors for all steel water storage tanks.

Table 5: Booster Pump Station Summary

Booster Pump Station Site	Address	Facilities											
		Date Built	*Building*	*Fuel Storage*	*Chemical Storage*	*Pump HP*	*Capacity (GPM)*	*Generator*	*Structural Record Drawings*	*Roof Type*	*Lateral System*	*Noted Risk/Deficiences*	**Relative Risk [1]**
3 MG Tanks	850 East Ave	1965	(2) CMU (1) Wood Framed		NaOCl	(6) 50 (1) 150	(7) 3500	Yes	1965	(2) Steel deck over steel and wood framing (1) Alumin Sheet over Wood	(2) Partially Grouted CMU (1) Aluminun and Wood Shear Wall	1. The building is lightly reinforced and partially grouted, it may not be up to current building standards 2. The building slab is 4", equipment is unlikely to have adequate anchorage	4
5 MG Tank	2404 Old Nadeua RD	1960	Yes	Propane	NaOCl	40	_	No	1992		Solid Grouted CMU with wood studs	Potential irregularity do the the mixed resisting System	4
6 MG Tank	700 East Avenue S	1999	Yes		Salt/ NaOCl	(1) 100 (1) 150 (2) 200 (2) 250 (2) 250	(1) 2000 (1) 2800 (2) 7000 (3) 3500	No	1999	(1) Open web steel joists (1) Steel deck over steel framing (1) Subgrade concrete structure for the hydropnuematic tank	Solid Grouted CMU	Relatively Thin Slab may result in inadequate anchorage for some equipment. Single story solid grouted CMU structures are very resistant to earthquake damage.	3
25th Street	26946 Cemetary Rd	1987/ 1996/ 2001	yes		Salt/ NaOCl	50 100	99	315 Kw	Not Available	Wood deck over 2x wood framing	Wood stud shearwall	Wood Stud buildings tend to be resiliant to earthquakes provided adeqate attachments are present. The 3 1/2" may result in inadequate anchorage for equipment. Structural drawings from the orignal construction are not availabe for review.	3
45th Street	36510 45th St E		Yes		NaOCl	(3) 150 (3) 125	(3) 3500 (3) 3500	NO	1998 2004 2001	(1) Wood Deck over Wood Framing (2) Steel deck over steel framing	(1) Wood stud shear wall (2) Solid grouted CMU	Both wood stud and Solid Grouted CMU shear wall structures are resistent to earthquake loads. All three buildings appear to have complete load paths. The generator buildng floor slab is only 4" thick and may not provide adequate anchorage to any floor mounted equipment.	8
Avenue T-8	4250 E. Ave. T-8	1995	Yes		Salt/NaOCl	(2) 15 (1) 50	(3) 3250	No	Addition 1998	Wood deck over 2x wood framing	Wood stud shearwall	Construction drawings for the original building are not available for review, wood framed structures are generally resistent to earthquake.	8
El Camino Lower	36336 El Camino Dr	2000	Yes		NaOCl	(1) 40 (1) 75	Not recorded on Drawings	No	2000	Wood deck over wood framing	Solid grouted CMU	Wood diaphrams with solid grouted CMU wall are generally resistent to earthquakes loads.	8
El Camino Under Ground					NaOCl								8
Well 14	36401 20th St E	1997	Yes		Salt	250	1,188		1997	Wood deck over 2x wood framing	Solid grouted CMU and wood stud shear walls	Potential irregularity do the the mixed resisting System. Construction drawings from the original building were not avaible for review.	8
Well 5	39401 20th St East	1663	Yes		Salt	250	1,188		Not avaiable				3
Alta Valley Well 18 and 19	4640 Barrel Springs Road	1976 1997	Yes		NaOCl	5	96 127		1976 1997	Wood deck over wood framing	Wood stud shearwall	Relatively thin slab may result in inadequate anchorage for some equipment. Single story solid grouted CMU structures are very resistant to earthquake damage.	3
3600 ft boosters	601 Lakeview Dr	1966	Yes			20	110		Not availalable			Record drawings were not avaible for the existing building, field investigations are required.	1
3900 boosters	36200 El Camino Dr	1954	Yes		NaOCl	5	96						7
		1961					127						3
Hilltop	35609 Cheseboro Rd	Multiple	Yes		NaOCl	60	227		Not Available			Record drawings are not aviable, howerver the small size of the buidlng represents minimal risk.	2

Appendix A: Detailed Calculations

Tank Site	Address	Coordinates		Tank Details											AWWA D100-11 Welded Carbon Steel Tanks Chapter 13 Seismic Design																																								
																Table 28	13.2.1	Table 24	ATC ^{1}	Eqn 13-9 ^{1,2}	Eqn 13-22	Eqn 13-12/13 ^{2}				13-27	13-25/26	Eqn 13-28/29	Estimate	Estimate	Estimate	Eqn 13-16		Eqn 13-24/25		Eqn 13-30			Eqn 13-26	Eqn 13-31	Eqn 13-23	Eqn 13-37		Eqn 13-41	Eqn 13-36		Eqn 13-53/54			Eqn 13-52	Table 29		Eqn 13-57		
		Latitude	Longitude	Tank Type	Piping Connection	Footing	Anchorage	Date Built		Dia	Size	Bottom of the Knuckle	Top of Knuckle	Overflow Height	Freeboard Assumed to be 3 feet unless drawings indicate otherwise	Ri 3 if anchored 2.5 if unanchored	Seismic Use Group	I_E, assume that all tanks are Seismic Use Group III	Sd1, per ATC Seismic Hazard Maps	Sai, g Based on Sds from ASCE 7-10	Sloshing Period, Tc(Ss	Sac, g Based on Sd1 from ASCE 7-10	D/H	3.67*D/H	Volume ft ^{3} Vol = π*(Dia^2)/4	Total Weight, lbf W = Vol*62.4pcf	Impulsive Weight, Moves with Tank, (Wi)	Centroid of the lateral Force due to Sloshing (Xi), ft	Weight of the Roof (Wr), lbf	Weight of the Shell (Ws), lbf	Weight of the Floor (Wf), lbf	Implusive Design Acceleration (Ai)	Impulsive Lateral Force (Vi), kip	Overturning Moment due to Impulsive Lateral Force(Mi), ft-kip	Convective Weight (Wc), lbf	Centroid of the lateral force do to convective mass (Xc), ft	Convective Design Acceleration (Ai)	Convective Lateral Force (Vc), kip	Overturning Moment due to Convective Lateral Force(Mc), ft-kip	Design Lateral Force at the top of the foundation (Vf), kip	Design Overturning Moment (Ms), ft-kip Ms = $\sqrt{(Mi^2+Mc^2)}$	Maximum Resting Weight of the Tank Contents (wL), lbf/ft		Weight of the Tank Shell and Roof Resisting Overturning (wt), lbf/ft	Overturning Ratio, J	Anchor Requirements	Convective Design Accelaration, Af			Sloshing Wave Height (d), ft	Minimum Required Freeboard (D), ft	Actual Freeboard (Roof Height-Overflow)	Allowable Lateral Load, V_{allow} (kip)	Total Lateral Seismic Load, Vt (Kip)	Sliding Check
3 MG Tank Site	850 East Avenue S	34.56	-118.11	Welded				1960		124	3,000,000		Unknown	34	3	2.5	iii	1.5	1.315	1.805	7.35	0.27	3.647	1.006	410594	25621040	8082906	13	92459	138480	92459	0.774	6503	82912	16424329	18	0.192	3150	57649	7226	100984	2185	5396	474	2.54	Provide Anchors	0.27	0.29	0.27	16.65	16.65	3	12851	7225.51729	OK
5 MG Tank	2404 Old Nadeau Road	34.53	-118.08							160	5,000,000		Unknown	20	3	2.5	iii	1.5	1.302	1.764	11.13	0.13	8.000	0.459	402124	25092529	3621894	8	153938	104550	153938	0.756	3050	22875	19810034	10	0.090	1784	18144	3533	29197	1676	4096	361	0.57	Tank Is Stable	0.18	0.13	0.13	10.08	10.08	3	12338	3533.2461	OK
6MG	641 East Ave S	34.56	-118.15					1999		206	6,000,000		Unknown	24	3	2.5	iii	1.5	1.316	1.804	13.03	0.09	8.583	0.428	799900	49913745	6714999	9	255176	160865	255176	0.773	5711	51395	39739497	12	0.066	2640	32159	6291	60628	1836	6328	446	0.64	Tank Is Stable	0.15	0.09	0.09	9.58	9.58	3	24349	6291.49113	OK
25th Street	26496 Cemetary Road	34.55	-118.09					1976		106	2,000,000		Unknown	30	3	2.5	iii	1.5	1.316	1.804	6.74	0.29	3.533	1.039	264742	16519902	5375203	11	67564	104870	67564	0.773	4341	48840	10436273	16	0.209	2185	35431	4860	60339	2052	4070	416	2.23	Provide Anchors	0.29	0.35	0.29	15.53	15.53	3	8304	4860.10557	OK
				Welded	Not Flexible	Ringwall with Sand Interior		1967		154	4,000,000		Unknown	30	3	2.5	iii	1.5	1.278	1.779	9.13	0.18	5.133	0.715	558795	34868813	7841520	11	142609	151052	142609	0.762	6311	71001	25267634	16	0.131	3318	51781	7130	87878	2052	5914	460	1.51	Uplift but Stable	0.21	0.18	0.18	14.15	14.15	3	17380	7130.09689	OK
45th Street	36510 45th St East	34.54	-118.05					1988		130	3,000,000		Unknown	30	3	2.5	iii	1.5	1.214	1.723	7.92	0.23	4.333	0.847	398197	24847485	6614006	11	101623	127961	101623	0.738	5129	57696	17074207	16	0.164	2805	44414	5845	72811	2052	4992	438	1.77	Provide Anchors	0.23	0.23	0.23	14.95	14.95	3	12488	5845.27581	OK
								1990		150	4,000,000		Unknown	32	3	2.5	iii	1.5	1.214	1.723	8.73	0.19	4.688	0.783	565487	35286369	8687384	12	135297	157017	135297	0.738	6731	80769	24894926	17	0.137	3398	56992	7540	98852	2120	6144	477	1.74	Provide Anchors	0.21	0.19	0.19	14.33	14.33	3	17687	7540.06677	OK
								1990		150	4,000,000		Unknown	32	3	2.5	iii	1.5	1.214	1.723	8.73	0.19	4.688	0.783	565487	35286369	8687384	12	135297	157017	135297	0.738	6731	80769	24894926	17	0.137	3398	56992	7540	98852	2120	6144	477	1.74	Provide Anchors	0.21	0.19	0.19	14.33	14.33	3	17687	7540.06677	OK
47th Street	35645 47th St East	34.53	-118.05					1967		106	2,000,000		Unknown	30	3	2.5	iii	1.5	1.325	1.81	6.74	0.30	3.533	1.039	264742	16519902	5375203	11	67564	104870	67564	0.776	4356	49003	10436273	16	0.211	2200	35674	4880	60613	2052	4070	416	2.24	Provide Anchors	0.30	0.35	0.30	15.64	15.64	3	8301	4879.72502	OK
								1990		132	3,000,000		Unknown	30	3	2.5	iii	1.5	1.325	1.81	8.02	0.25	4.400	0.834	410543	25617904	6716566	11	104774	129885	104774	0.776	5473	61576	17698347	16	0.177	3126	49427	6303	78960	2052	5069	440	1.87	Provide Anchors	0.25	0.25	0.25	16.32	16.32	3	12801	6303.06969	OK
50th Street	5001 East Ave, T-8	34.54	-118.04					2007		150	4,000,000		Unknown	30	3	2.5	iii	1.5	1.26	1.768	8.93	0.19	5.000	0.734	530144	33080971	7637298	11	135297	147203	135297	0.758	6103	68664	23796213	16	0.135	3223	50405	6902	85178	2052	5760	456	1.55	Provide Anchors	0.21	0.19	0.19	14.22	14.22	3	16514	6902.16829	OK
				Welded?	?	Concrete Ring Wall	None Shown	2007		150	4,000,000		Unknown		3	2.5	iii	1.5	1.26	1.768	8.93	0.19	5.000	0.734	530144	33080971	7637298	11	135297	147203	135297	0.758	6103	68664	23796213	16	0.135	3223	50405	6902	85178	2052	5760	456	1.55	Provide Anchors	0.21	0.19	0.19	14.22	14.22	3	16514	6902.16829	OK
Ana Verde	36800 Tovey Aveneu	34.55	-118.15	Welded	Not Flexible	Concrete Rink wall	Not Shown	1963		40	300,000		Unknown	32	3	2.5	iii	1.5	1.214	1.639	3.66	0.50	1.250	2.936	40212	2509253	1825481	12	9621	44129	9621	0.702	1327	16240	717357	22	0.355	255	5658	1351	17197	2120	1638	389	5.44	Provide Anchors	0.50	1.09	0.50	9.95	9.95	3	1363	1351.04608	OK
El Camino Lower	36809 El Camino Dr.	34.55	-118.13					1988		106	2,000,000		Unknown	32	3	2.5	iii	1.5	1.27	1.714	6.63	0.29	3.313	1.108	282391	17621228	6103267	12	67564	111862	67564	0.735	4665	55977	10784811	17	0.205	2215	38666	5164	68033	2120	4342	437	2.42	Provide Anchors	0.29	0.35	0.29	15.24	15.24	3	8916	5163.80732	OK
El Camino U.G^4	36336 El Camino Road							1994		104	1,500,000		Unknown	26																																									
El Camino Upper	33030 Ridge Route Rd	34.54	-118.13	Welded	Flexible	Ringwall with Sand Inte	None Shown	1963		40	300,000		Unknown	32	3	2.5	iii	1.5	0.881	1.543	3.66	0.36	1.250	2.936	40212	2509253	1825481	12	9621	44129	9621	0.661	1249	15289	717357	22	0.258	185	4106	1263	15830	2120	1638	389	5.00	Provide Anchors	0.36	0.79	0.36	7.22	7.22	3	1371	1262.69341	OK
Walt Dahlitz	115 East Avenue S			Welded	Flexible	Concrete Ringwall, oil s	None Shown	1993		104	1,500,000		Unknown	31	3	2.5	iii	1.5	0.827	1.442	6.58	0.19	3.355	1.094	263341	16432470	5622265	12	65039	106378	65039	0.618	3621	42091	10122208	17	0.135	1362	22997	3869	47963	2086	4127	425	1.80	Provide Anchors	0.19	0.23	0.19	9.80	9.80	3	8455	3868.50122	OK
Well 14	36401 20th ST East			Weled?	Not Flexible	Concrete Ringwall, grav	3/4" 5' OC 8" embed			27	100,000		Unknown	22	3	2.5	iii	1.5	0.927	1.514	3.01	0.46	1.227	2.990	12596	786004	575712	8	4384	21166	4384	0.649	393	3325	220749	15	0.330	73	1119	400	3509	1758	760	275	4.80	Provide Anchors	0.46	1.23	0.46	6.24	6.24	3	435	399.685968	OK
Well 18 and 19	4640 Barrel Springs Road							1963		22	41,000		Unknown	30	3	2.5	iii	1.5	1.323	1.8	2.71	0.73	0.733	5.005	11404	711608	597846	13	2910	24053	2910	0.771	484	6262	120014	24	0.524	63	1513	488	6442	2052	845	369	11.47	Provide Anchors	0.73	2.17	0.73	8.06	8.06	3	387	488.300415	Needs Anchors
Well 5	1036 Barrel Spring Road							1963		30	1,463,945		Unknown	22	3	2.5	iii	1.5	1.311	1.782	3.18	0.62	1.364	2.691	15551	970375	680168	8	5412	23283	5412	0.764	546	4500	301560	15	0.442	133	1982	562	4918	1758	845	276	5.05	Provide Anchors	0.62	1.56	0.62	9.29	9.29	3	526	561.571023	Needs Anchors

1. Design spectral response acceleration parameters, S_{D1} and S_{DS}, have been determined using the Applied Technology Council's (ATC) web based hazard maps in accordance with the American Society of Civil Engineers Standard 7, Minimum Design Loads for Buildings and Other Structures (ASCE 7-10)

2. The Design spectrum for impulsive components, Sai and the Design Spectrum for convective components, Sac have been determined in accordance with Chapter 13 of the AWWA D100-11, Welded Carbon Steel Tnaks for Water Storage. These parameters are expressed as a percentage of the accelration due to gravity, g.

3. Facility list indicates that these facilities conatain 0 gallons and does not provide the overflow height, therefore we were not apple to determine the seismic demands on these structures.
4. AWWA D100 calculations do not apply to the El Camino Underground tank. Construction drawings are not available to perform an analysis at this time.
4. Minimum required freeboard is equal to the sloshing wave height for Use Group III and may be reduced for Use Group I and II

Hazards by Location

Search Information

Coordinates:	34.557353817153206, -118.11224470422972
Elevation:	2750 ft
Timestamp:	2021-04-09T16:22:17.704Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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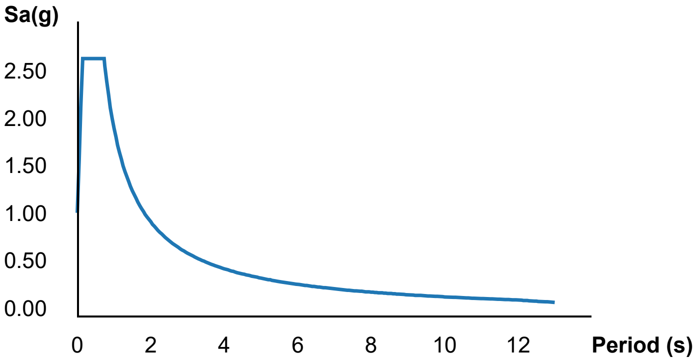
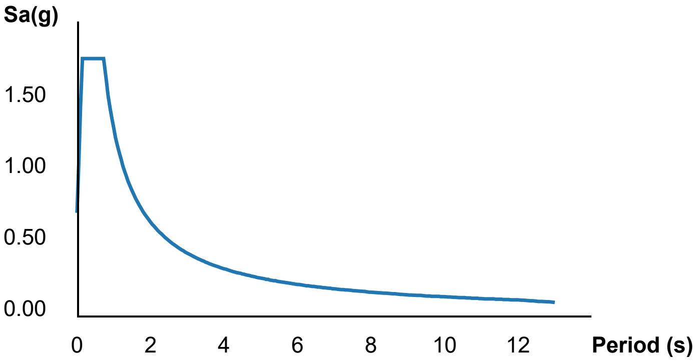
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.707	MCE$_R$ ground motion (period=0.2s)
S_1	1.315	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.707	Site-modified spectral acceleration value
S_{M1}	1.973	Site-modified spectral acceleration value
S_{DS}	1.805	Numeric seismic design value at 0.2s SA
S_{D1}	1.315	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.919	Coefficient of risk (0.2s)
CR_1	0.903	Coefficient of risk (1.0s)

PGA	1.045	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.045	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.418	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.719	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.707	Factored deterministic acceleration value (0.2s)
S1RT	1.605	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.778	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.315	Factored deterministic acceleration value (1.0s)
PGAd	1.045	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Coordinates:	34.53471326457233, -118.08343773439331
Elevation:	2968 ft
Timestamp:	2021-04-09T16:35:02.162Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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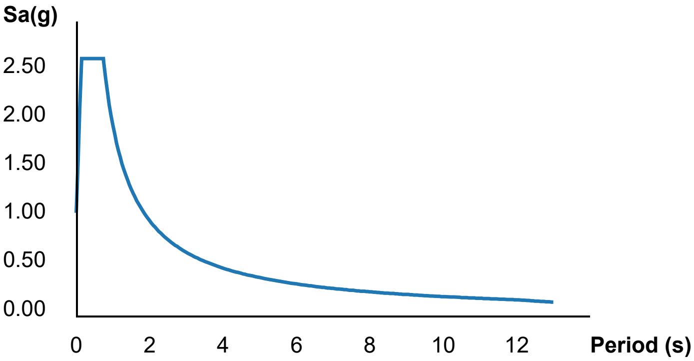
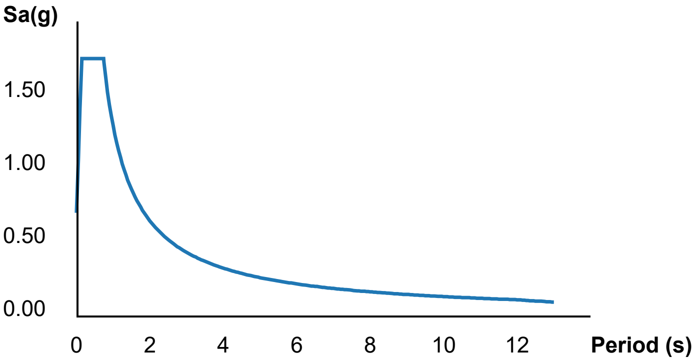
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.646	MCE_R ground motion (period=0.2s)
S_1	1.302	MCE_R ground motion (period=1.0s)
S_{MS}	2.646	Site-modified spectral acceleration value
S_{M1}	1.953	Site-modified spectral acceleration value
S_{DS}	1.764	Numeric seismic design value at 0.2s SA
S_{D1}	1.302	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.924	Coefficient of risk (0.2s)
CR_1	0.904	Coefficient of risk (1.0s)

PGA	1.018	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.018	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.282	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.552	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.646	Factored deterministic acceleration value (0.2s)
S1RT	1.53	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.694	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.302	Factored deterministic acceleration value (1.0s)
PGAd	1.018	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Address:	34547
Coordinates:	34.5497, -118.132821
Elevation:	2923 ft
Timestamp:	2021-04-08T21:00:34.329Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	III
Site Class:	D

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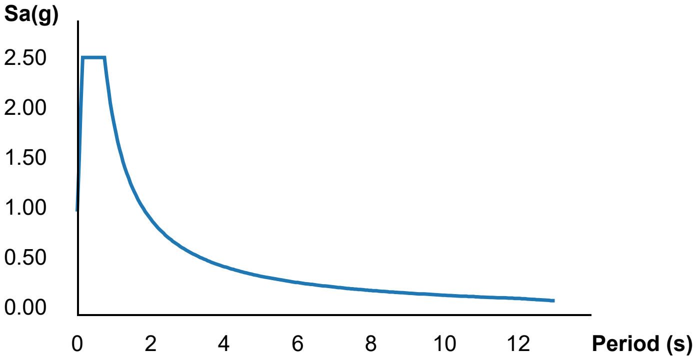
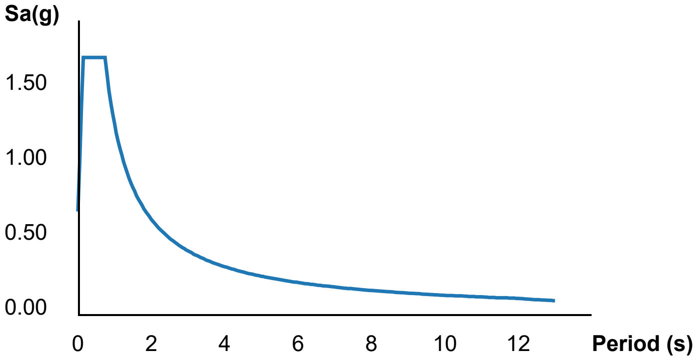
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.573	MCE_R ground motion (period=0.2s)
S_1	1.271	MCE_R ground motion (period=1.0s)
S_{MS}	2.573	Site-modified spectral acceleration value
S_{M1}	1.906	Site-modified spectral acceleration value
S_{DS}	1.715	Numeric seismic design value at 0.2s SA
S_{D1}	1.271	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.916	Coefficient of risk (0.2s)

CR_1	0.904	Coefficient of risk (1.0s)
PGA	0.987	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.987	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.429	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.743	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.573	Factored deterministic acceleration value (0.2s)
S1RT	1.614	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.785	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.271	Factored deterministic acceleration value (1.0s)
PGAd	0.987	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Coordinates:	34.559419345037064, -118.11618400870667
Elevation:	2750 ft
Timestamp:	2021-04-09T16:36:57.402Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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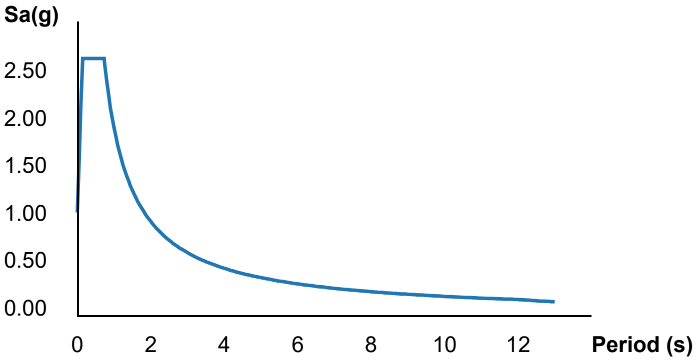
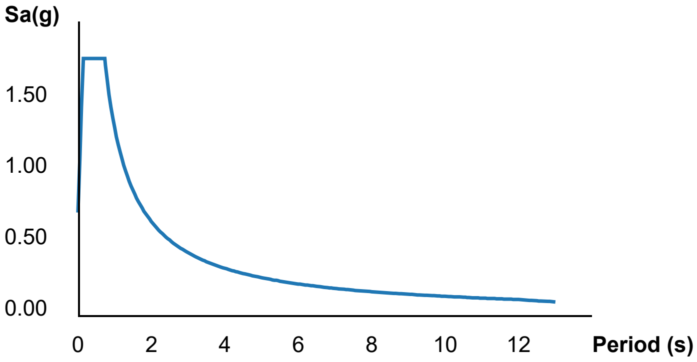
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.706	MCE_R ground motion (period=0.2s)
S_1	1.316	MCE_R ground motion (period=1.0s)
S_{MS}	2.706	Site-modified spectral acceleration value
S_{M1}	1.975	Site-modified spectral acceleration value
S_{DS}	1.804	Numeric seismic design value at 0.2s SA
S_{D1}	1.316	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.92	Coefficient of risk (0.2s)
CR_1	0.903	Coefficient of risk (1.0s)

PGA	1.046	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.046	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.37	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.665	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.706	Factored deterministic acceleration value (0.2s)
S1RT	1.58	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.749	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.316	Factored deterministic acceleration value (1.0s)
PGAd	1.046	Factored deterministic acceleration value (PGA)

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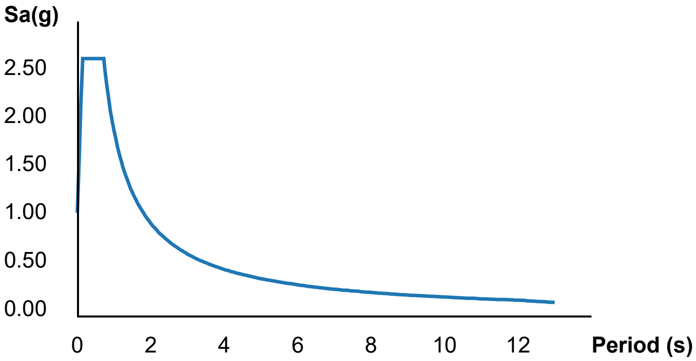
Hazards by Location

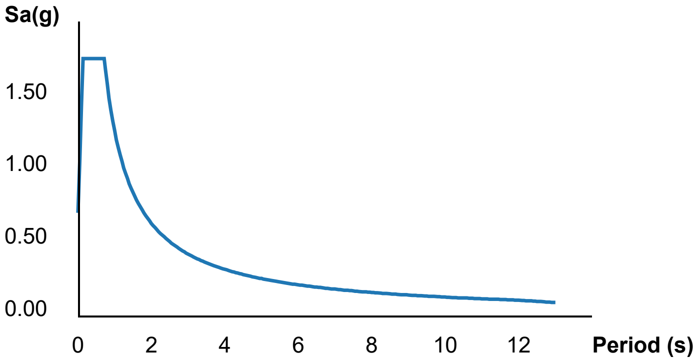
Search Information

Coordinates:	34.55371, -118.087856
Elevation:	2752 ft
Timestamp:	2021-04-09T16:19:01.173Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.668	MCE_R ground motion (period=0.2s)
S_1	1.278	MCE_R ground motion (period=1.0s)
S_{MS}	2.668	Site-modified spectral acceleration value
S_{M1}	1.917	Site-modified spectral acceleration value
S_{DS}	1.779	Numeric seismic design value at 0.2s SA
S_{D1}	1.278	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.919	Coefficient of risk (0.2s)
CR_1	0.902	Coefficient of risk (1.0s)

PGA	1.031	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.031	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.432	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.737	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.668	Factored deterministic acceleration value (0.2s)
S1RT	1.613	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.788	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.278	Factored deterministic acceleration value (1.0s)
PGAd	1.031	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Coordinates:	34.55371, -118.087856
Elevation:	2752 ft
Timestamp:	2021-04-09T16:17:53.781Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	IV
Site Class:	D-default

Map data ©2021 Imagery ©2021 , CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

Basic Parameters

Name	Value	Description
S_S	2.404	MCE_R ground motion (period=0.2s)
S_1	1.025	MCE_R ground motion (period=1.0s)
S_{MS}	2.885	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.923	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

▾Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.874	Coefficient of risk (0.2s)
CR_1	0.869	Coefficient of risk (1.0s)
PGA	1.033	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	1.24	Site modified peak ground acceleration

T_L	12	Long-period transition period (s)
SsRT	3.008	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.441	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.404	Factored deterministic acceleration value (0.2s)
S1RT	1.294	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.489	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.025	Factored deterministic acceleration value (1.0s)
PGAd	1.033	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

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ATC Hazards by Location

Search Information

Coordinates:	34.544961034712664, -118.04877924893493
Elevation:	2740 ft
Timestamp:	2021-04-09T16:27:34.922Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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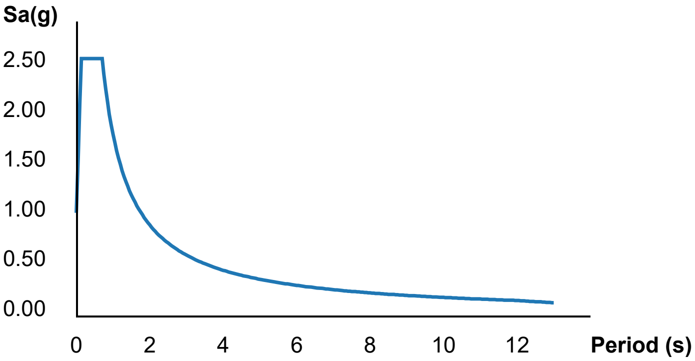
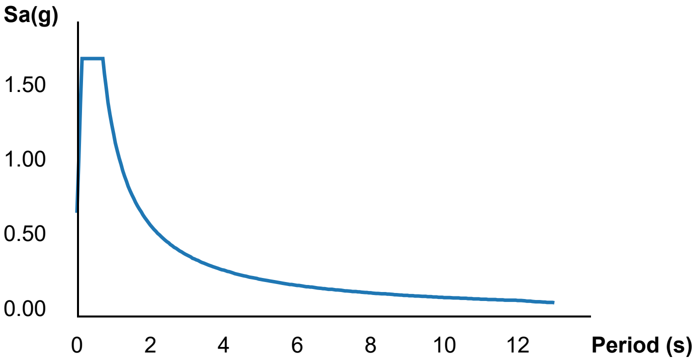
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.584	MCE_R ground motion (period=0.2s)
S_1	1.214	MCE_R ground motion (period=1.0s)
S_{MS}	2.584	Site-modified spectral acceleration value
S_{M1}	1.821	Site-modified spectral acceleration value
S_{DS}	1.723	Numeric seismic design value at 0.2s SA
S_{D1}	1.214	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.921	Coefficient of risk (0.2s)
CR_1	0.905	Coefficient of risk (1.0s)

PGA	0.996	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.996	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.159	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.432	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.584	Factored deterministic acceleration value (0.2s)
S1RT	1.47	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.624	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.214	Factored deterministic acceleration value (1.0s)
PGAd	0.996	Factored deterministic acceleration value (PGA)

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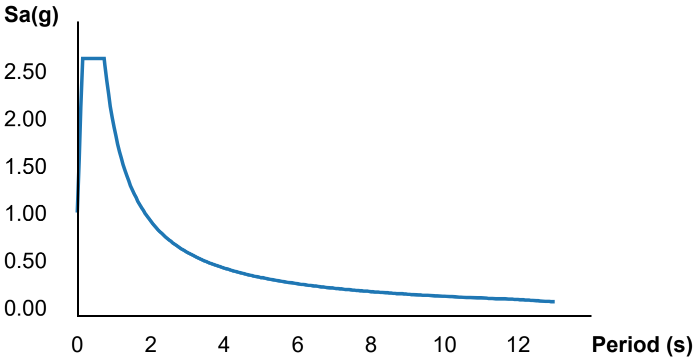
ATC Hazards by Location

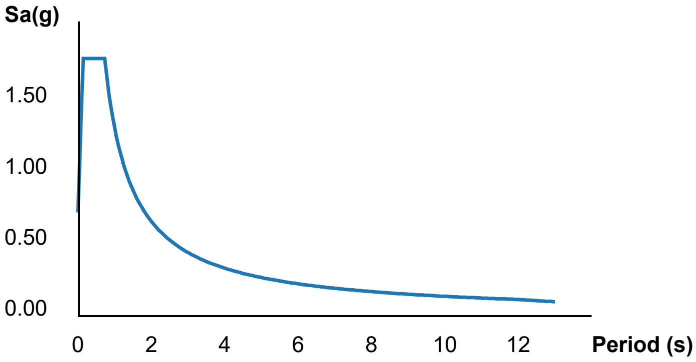
Search Information

Coordinates:	34.52903336279662, -118.04584351481934
Elevation:	2971 ft
Timestamp:	2021-04-09T16:31:06.633Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.714	MCE$_R$ ground motion (period=0.2s)
S_1	1.325	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.714	Site-modified spectral acceleration value
S_{M1}	1.987	Site-modified spectral acceleration value
S_{DS}	1.81	Numeric seismic design value at 0.2s SA
S_{D1}	1.325	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.923	Coefficient of risk (0.2s)
CR_1	0.905	Coefficient of risk (1.0s)

PGA	1.048	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.048	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.142	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.404	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.714	Factored deterministic acceleration value (0.2s)
S1RT	1.461	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.614	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.325	Factored deterministic acceleration value (1.0s)
PGAd	1.048	Factored deterministic acceleration value (PGA)

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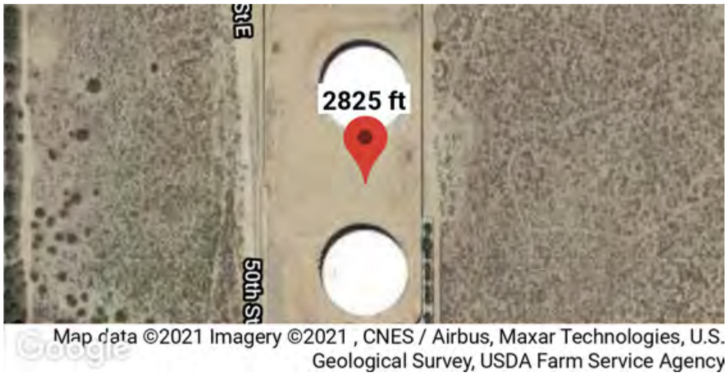
Hazards by Location

Search Information

Coordinates:	34.536316858195896, -118.04017088147585
Elevation:	2825 ft
Timestamp:	2021-04-09T16:33:04.897Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D



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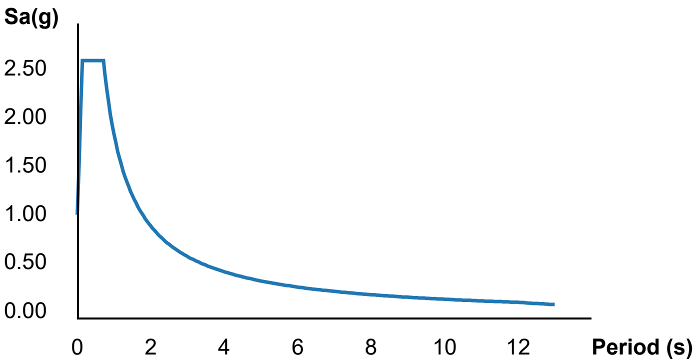
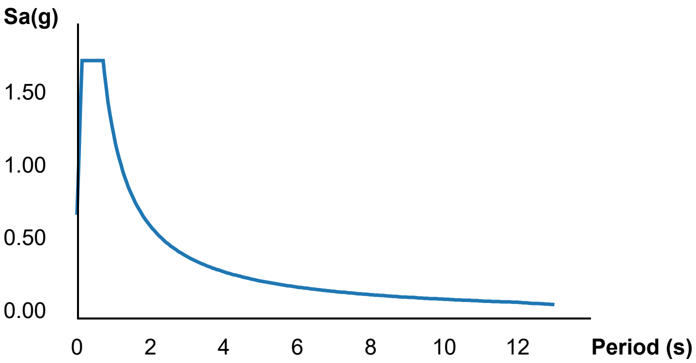
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.652	MCE$_R$ ground motion (period=0.2s)
S_1	1.26	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.652	Site-modified spectral acceleration value
S_{M1}	1.889	Site-modified spectral acceleration value
S_{DS}	1.768	Numeric seismic design value at 0.2s SA
S_{D1}	1.26	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.923	Coefficient of risk (0.2s)
CR_1	0.905	Coefficient of risk (1.0s)

PGA	1.024	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.024	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.121	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.381	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.652	Factored deterministic acceleration value (0.2s)
S1RT	1.449	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.602	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.26	Factored deterministic acceleration value (1.0s)
PGAd	1.024	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Coordinates:	34.54972773620536, -118.1502535834671
Elevation:	3116 ft
Timestamp:	2021-04-09T16:41:41.594Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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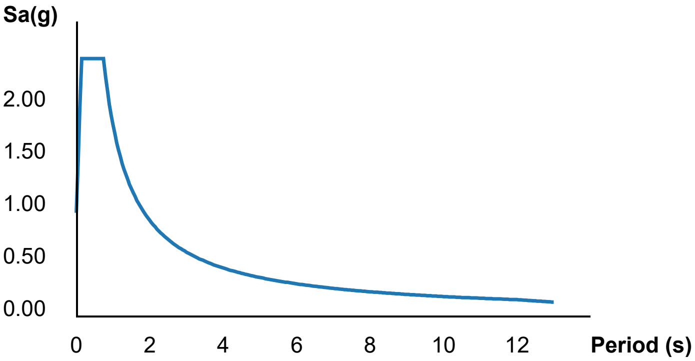
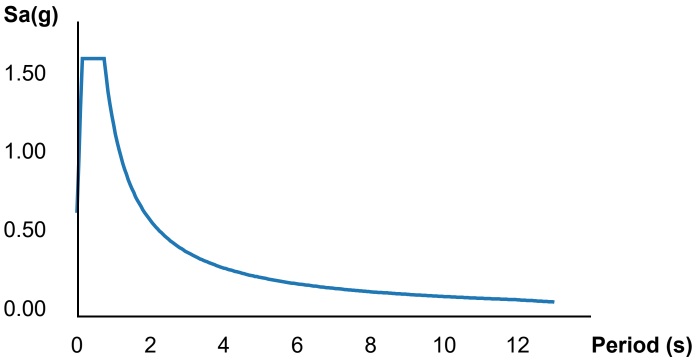
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.458	MCE_R ground motion (period=0.2s)
S_1	1.214	MCE_R ground motion (period=1.0s)
S_{MS}	2.458	Site-modified spectral acceleration value
S_{M1}	1.82	Site-modified spectral acceleration value
S_{DS}	1.639	Numeric seismic design value at 0.2s SA
S_{D1}	1.214	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.916	Coefficient of risk (0.2s)
CR_1	0.906	Coefficient of risk (1.0s)

PGA	0.945	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.945	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.335	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.642	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.458	Factored deterministic acceleration value (0.2s)
S1RT	1.566	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.728	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.214	Factored deterministic acceleration value (1.0s)
PGAd	0.945	Factored deterministic acceleration value (PGA)

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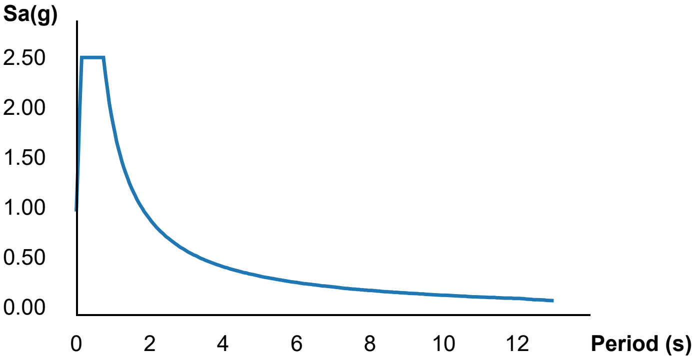
ATC Hazards by Location

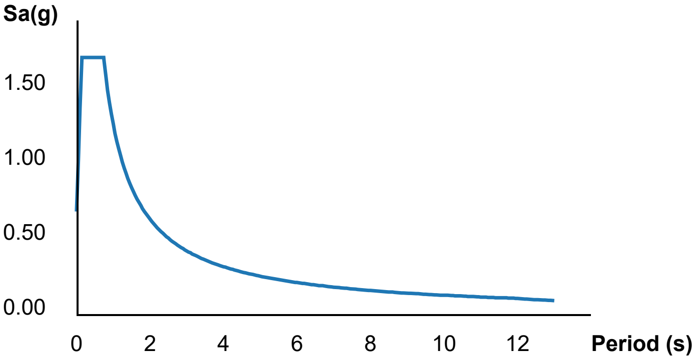
Search Information

Address:	36809 El Camino Dr, Palmdale, CA 93551, USA
Coordinates:	34.54952240000001, -118.1326806
Elevation:	2925 ft
Timestamp:	2021-04-09T16:20:57.078Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.571	MCE_R ground motion (period=0.2s)
S_1	1.27	MCE_R ground motion (period=1.0s)
S_{MS}	2.571	Site-modified spectral acceleration value
S_{M1}	1.905	Site-modified spectral acceleration value
S_{DS}	1.714	Numeric seismic design value at 0.2s SA
S_{D1}	1.27	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.916	Coefficient of risk (0.2s)

CR_1	0.904	Coefficient of risk (1.0s)
PGA	0.986	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.986	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.426	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.74	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.571	Factored deterministic acceleration value (0.2s)
S1RT	1.613	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.783	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.27	Factored deterministic acceleration value (1.0s)
PGAd	0.986	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Coordinates:	34.53840630847815, -118.13288506137695
Elevation:	3359 ft
Timestamp:	2021-04-09T20:04:43.993Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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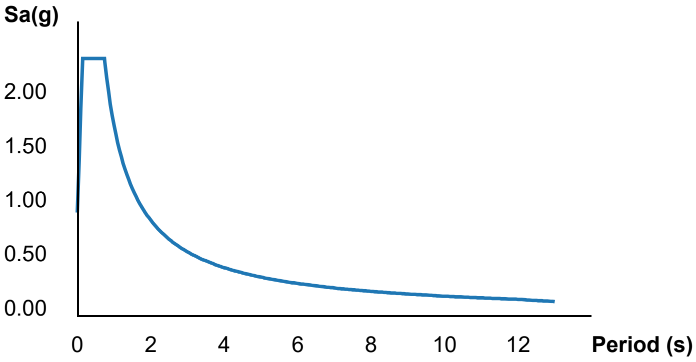
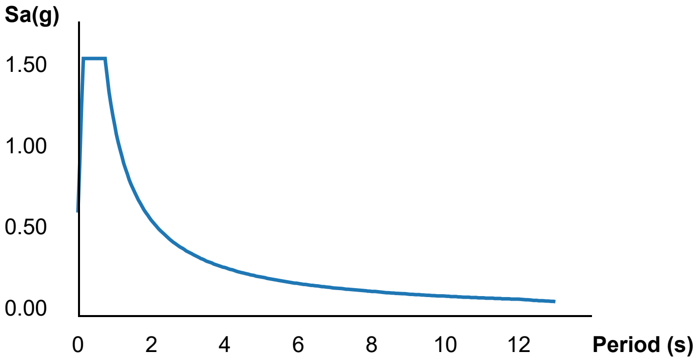
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.375	MCE_R ground motion (period=0.2s)
S_1	1.171	MCE_R ground motion (period=1.0s)
S_{MS}	2.375	Site-modified spectral acceleration value
S_{M1}	1.756	Site-modified spectral acceleration value
S_{DS}	1.583	Numeric seismic design value at 0.2s SA
S_{D1}	1.171	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.925	Coefficient of risk (0.2s)
CR_1	0.908	Coefficient of risk (1.0s)

PGA	0.917	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.917	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.236	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.499	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.375	Factored deterministic acceleration value (0.2s)
S1RT	1.505	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.657	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.171	Factored deterministic acceleration value (1.0s)
PGAd	0.917	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Coordinates:	34.56128566737895, -118.12898168848265
Elevation:	2924 ft
Timestamp:	2021-04-09T20:40:24.218Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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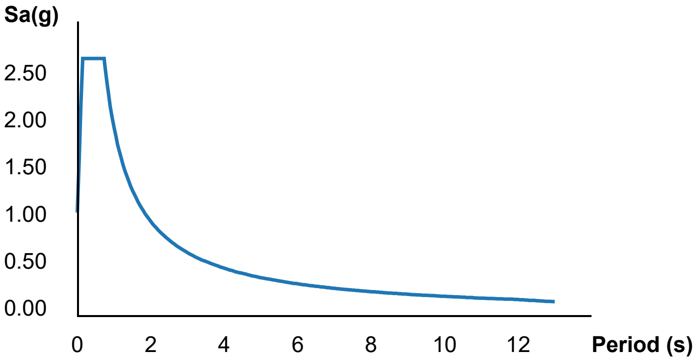
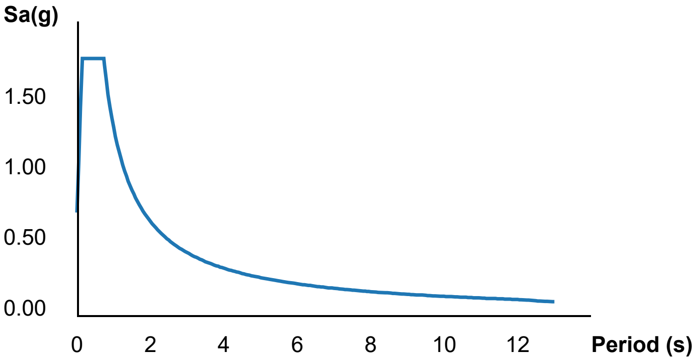
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.733	MCE$_R$ ground motion (period=0.2s)
S_1	1.331	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.733	Site-modified spectral acceleration value
S_{M1}	1.997	Site-modified spectral acceleration value
S_{DS}	1.822	Numeric seismic design value at 0.2s SA
S_{D1}	1.331	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.92	Coefficient of risk (0.2s)
CR_1	0.904	Coefficient of risk (1.0s)

PGA	1.055	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.055	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.306	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.594	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.733	Factored deterministic acceleration value (0.2s)
S1RT	1.547	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.71	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.331	Factored deterministic acceleration value (1.0s)
PGAd	1.055	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Address:	34547
Coordinates:	34.538438, -118.132863
Elevation:	3360 ft
Timestamp:	2021-04-08T22:06:10.243Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	III
Site Class:	D

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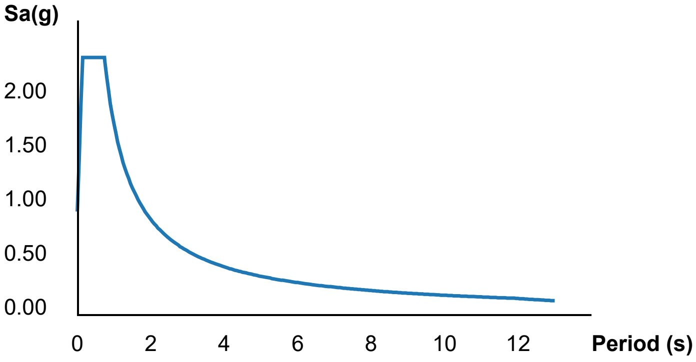
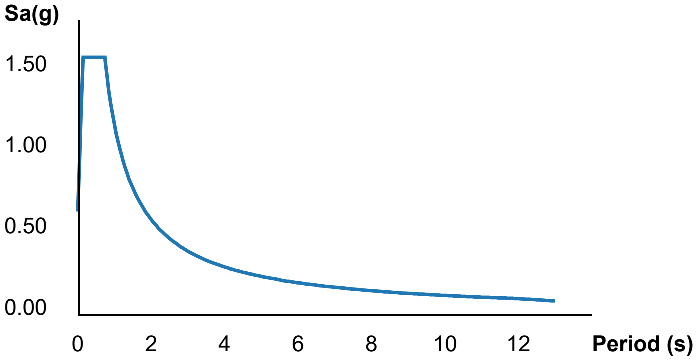
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.376	MCE_R ground motion (period=0.2s)
S_1	1.171	MCE_R ground motion (period=1.0s)
S_{MS}	2.376	Site-modified spectral acceleration value
S_{M1}	1.757	Site-modified spectral acceleration value
S_{DS}	1.584	Numeric seismic design value at 0.2s SA
S_{D1}	1.171	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.925	Coefficient of risk (0.2s)

CR_1	0.908	Coefficient of risk (1.0s)
PGA	0.917	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.917	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.236	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.5	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.376	Factored deterministic acceleration value (0.2s)
S1RT	1.505	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.657	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.171	Factored deterministic acceleration value (1.0s)
PGAd	0.917	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Coordinates:	34.598759799594845, -118.09844223112182
Elevation:	2583 ft
Timestamp:	2021-04-09T20:48:48.917Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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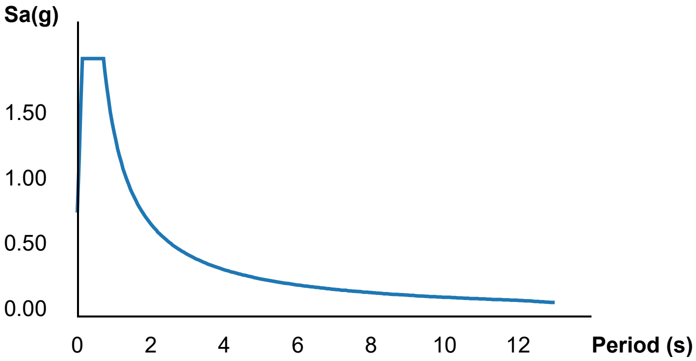
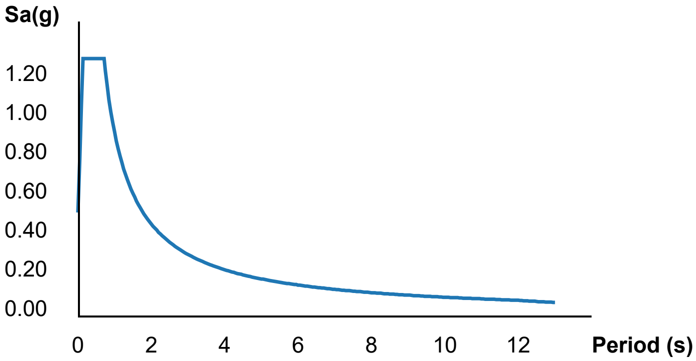
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	1.971	MCE_R ground motion (period=0.2s)
S_1	0.937	MCE_R ground motion (period=1.0s)
S_{MS}	1.971	Site-modified spectral acceleration value
S_{M1}	1.406	Site-modified spectral acceleration value
S_{DS}	1.314	Numeric seismic design value at 0.2s SA
S_{D1}	0.937	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.937	Coefficient of risk (0.2s)
CR_1	0.911	Coefficient of risk (1.0s)

PGA	0.77	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.77	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	2.602	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.776	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.971	Factored deterministic acceleration value (0.2s)
S1RT	1.168	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.282	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.937	Factored deterministic acceleration value (1.0s)
PGAd	0.77	Factored deterministic acceleration value (PGA)

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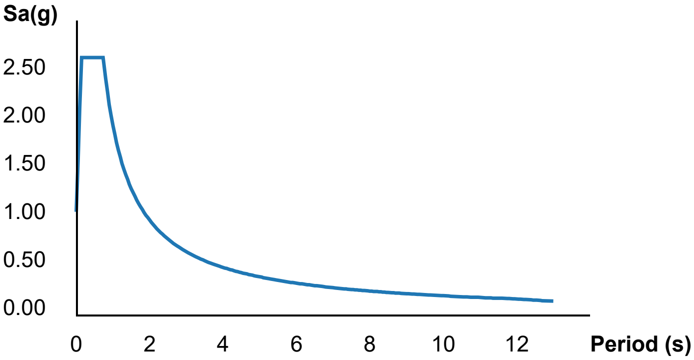
ATC Hazards by Location

Search Information

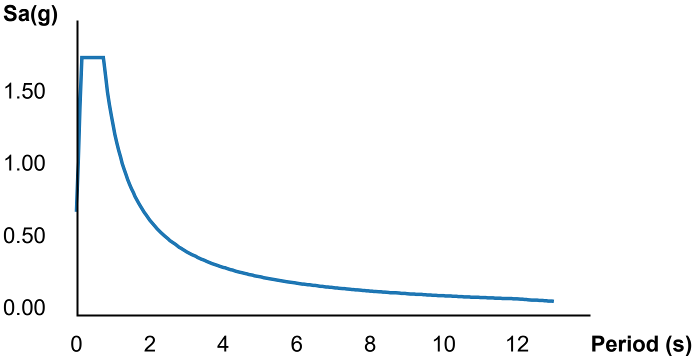
Address:	1036 Barrel Spring Road palmdale, ca
Coordinates:	34.5457226, -118.1085956
Elevation:	2817 ft
Timestamp:	2021-05-04T20:11:47.998Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	III
Site Class:	D

Map data ©2021 Imagery ©2021 , CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.674	MCE_R ground motion (period=0.2s)
S_1	1.311	MCE_R ground motion (period=1.0s)
S_{MS}	2.674	Site-modified spectral acceleration value
S_{M1}	1.967	Site-modified spectral acceleration value
S_{DS}	1.782	Numeric seismic design value at 0.2s SA
S_{D1}	1.311	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.919	Coefficient of risk (0.2s)

CR_1	0.902	Coefficient of risk (1.0s)
PGA	1.029	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.029	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.49	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.799	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.674	Factored deterministic acceleration value (0.2s)
S1RT	1.643	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.821	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.311	Factored deterministic acceleration value (1.0s)
PGAd	1.029	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Address: 15 4640 Barrel Spring Road palmdale, ca

Coordinates: 34.5268275, -118.0540864

Elevation: 3036 ft

Timestamp: 2021-05-04T20:14:23.952Z

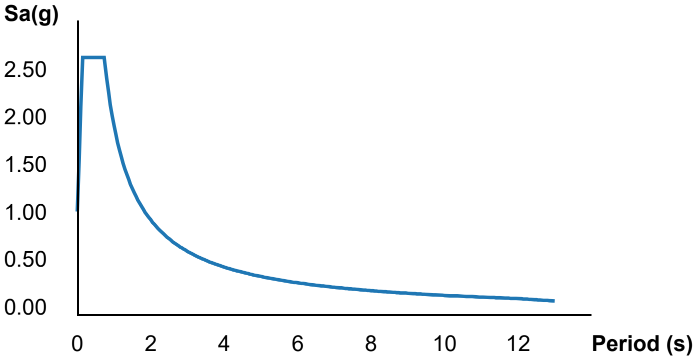
Hazard Type: Seismic

Reference Document: ASCE7-10

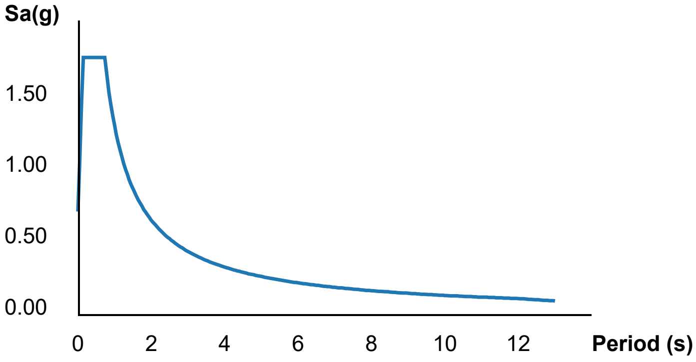
Risk Category: III

Site Class: D

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.7	MCE_R ground motion (period=0.2s)
S_1	1.323	MCE_R ground motion (period=1.0s)
S_{MS}	2.7	Site-modified spectral acceleration value
S_{M1}	1.984	Site-modified spectral acceleration value
S_{DS}	1.8	Numeric seismic design value at 0.2s SA
S_{D1}	1.323	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.924	Coefficient of risk (0.2s)

CR_1	0.905	Coefficient of risk (1.0s)
PGA	1.04	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.04	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.149	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.409	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.7	Factored deterministic acceleration value (0.2s)
S1RT	1.464	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.617	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.323	Factored deterministic acceleration value (1.0s)
PGAd	1.04	Factored deterministic acceleration value (PGA)

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															AWWA D100-11 Welded Carbon Steel Tanks Chapter 13 Seismic Design																																								
		Coordinates		Tank Details												Table 28	13.2.1	Table 24	ATC[1]	Eqn 13-9[1,2]	Eqn 13-22	Eqn 13-12/13[2]				13-27	13-25/26	Eqn 13-28/29	Estimate	Estimate	Estimate	Eqn 13-16		Eqn 13-24/25		Eqn 13-30			Eqn 13-26	Eqn 13-31	Eqn 13-23	Eqn 13-37		Eqn 13-41	Eqn 13-36		Eqn 13-53/54			Eqn 13-52	Table 29		Eqn 13-57		
Tank Site	Address	Latitude	Longitude	Tank Type	Piping Connection	Footing	Anchorage	Date Built		Dia	Size	Bottom of the Knuckle	Top of Knuckle	Overflow Height	Freeboard Assumed to be 3 feet unless drawings indicate otherwise	Ri 3 if anchored 2.5 if unanchored	Seismic Use Group	I_E, assume that all tanks are Seismic Use Group III	Sd1, per ATC Seismic Hazard Maps	Sai, g Based on Sds from ASCE 7-10	Sloshing Period, Tc(Ss	Sac, g Based on Sd1 from ASCE 7-10	D/H	3.67*D/H	Volume ft^3 Vol = π*(Dia^2)/4	Total Weight, lbf W = Vol*62.4pcf	Impulsive Weight, Moves with Tank, (Wi)	Centroid of the lateral Force due to Sloshing (Xi), ft	Weight of the Roof (Wr), lbf	Weight of the Shell (Ws), lbf	Weight of the Floor (Wf), lbf	Implusive Design Acceleration (Ai)	Impulsive Lateral Force (Vi), kip	Overturning Moment due to Impulsive Lateral Force(Mi), ft-kip	Convective Weight (Wc), lbf	Centroid of the lateral force do to convective mass (Xc), ft	Convective Design Acceleration (Ai)	Convective Lateral Force (Vc), kip	Overturning Moment due to Convective Lateral Force(Mc), ft-kip	Design Lateral Force at the top of the foundation (Vf), kip	Design Overturning Moment (Ms), ft-kip Ms = $\sqrt{(Mi^2+Mc^2)}$	Maximum Resting Weight of the Tank Contents (wL), lbf/ft		Weight of the Tank Shell and Roof Resisting Overturning (wt), lbf/ft	Overturning Ratio, J	Anchor Requirements	Convective Design Accelaration, Af			Sloshing Wave Height (d), ft	Minimum Required Freeboard (D), ft	Actual Freeboard (Roof Height-Overflow)	Allowable Lateral Load, V_{allow} (kip)	Total Lateral Seismic Load, Vt (Kip)	Sliding Check
3 MG Tank Site	850 East Avenue S	34.56	-118.11	Welded				1960		124	3,000,000		Unknown	34	3	2.5	iii	1.5	1.315	1.805	7.35	0.27	3.647	1.006	410594	25621040	8082906	13	92459	138480	92459	0.774	6503	82912	16424329	18	0.192	3150	57649	7226	100984	2185	5396	474	2.54	Provide Anchors	0.27	0.29	0.27	16.65	16.65	3	12851	7225.51729	OK
5 MG Tank	2404 Old Nadeau Road	34.53	-118.08							160	5,000,000		Unknown	20	3	2.5	iii	1.5	1.302	1.764	11.13	0.13	8.000	0.459	402124	25092529	3621894	8	153938	104550	153938	0.756	3050	22875	19810034	10	0.090	1784	18144	3533	29197	1676	4096	361	0.57	Tank Is Stable	0.18	0.13	0.13	10.08	10.08	3	12338	3533.2461	OK
6MG	641 East Ave S	34.56	-118.15					1999		206	6,000,000		Unknown	24	3	2.5	iii	1.5	1.316	1.804	13.03	0.09	8.583	0.428	799900	49913745	6714999	9	255176	160865	255176	0.773	5711	51395	39739497	12	0.066	2640	32159	6291	60628	1836	6328	446	0.64	Tank Is Stable	0.15	0.09	0.09	9.58	9.58	3	24349	6291.49113	OK
25th Street	26496 Cemetary Road	34.55	-118.09					1976		106	2,000,000		Unknown	30	3	2.5	iii	1.5	1.316	1.804	6.74	0.29	3.533	1.039	264742	16519902	5375203	11	67564	104870	67564	0.773	4341	48840	10436273	16	0.209	2185	35431	4860	60339	2052	4070	416	2.23	Provide Anchors	0.29	0.35	0.29	15.53	15.53	3	8304	4860.10557	OK
				Welded	Not Flexible	Ringwall with Sand Interior		1967		154	4,000,000		Unknown	30	3	2.5	iii	1.5	1.278	1.779	9.13	0.18	5.133	0.715	558795	34868813	7841520	11	142609	151052	142609	0.762	6311	71001	25267634	16	0.131	3318	51781	7130	87878	2052	5914	460	1.51	Uplift but Stable	0.21	0.18	0.18	14.15	14.15	3	17380	7130.09689	OK
45th Street	36510 45th St East	34.54	-118.05					1988		130	3,000,000		Unknown	30	3	2.5	iii	1.5	1.214	1.723	7.92	0.23	4.333	0.847	398197	24847485	6614006	11	101623	127961	101623	0.738	5129	57696	17074207	16	0.164	2805	44414	5845	72811	2052	4992	438	1.77	Provide Anchors	0.23	0.23	0.23	14.95	14.95	3	12488	5845.27581	OK
								1990		150	4,000,000		Unknown	32	3	2.5	iii	1.5	1.214	1.723	8.73	0.19	4.688	0.783	565487	35286369	8687384	12	135297	157017	135297	0.738	6731	80769	24894926	17	0.137	3398	56992	7540	98852	2120	6144	477	1.74	Provide Anchors	0.21	0.19	0.19	14.33	14.33	3	17687	7540.06677	OK
								1990		150	4,000,000		Unknown	32	3	2.5	iii	1.5	1.214	1.723	8.73	0.19	4.688	0.783	565487	35286369	8687384	12	135297	157017	135297	0.738	6731	80769	24894926	17	0.137	3398	56992	7540	98852	2120	6144	477	1.74	Provide Anchors	0.21	0.19	0.19	14.33	14.33	3	17687	7540.06677	OK
47th Street	35645 47th St East	34.53	-118.05					1967		106	2,000,000		Unknown	30	3	2.5	iii	1.5	1.325	1.81	6.74	0.30	3.533	1.039	264742	16519902	5375203	11	67564	104870	67564	0.776	4356	49003	10436273	16	0.211	2200	35674	4880	60613	2052	4070	416	2.24	Provide Anchors	0.30	0.35	0.30	15.64	15.64	3	8301	4879.72502	OK
								1990		132	3,000,000		Unknown	30	3	2.5	iii	1.5	1.325	1.81	8.02	0.25	4.400	0.834	410543	25617904	6716566	11	104774	129885	104774	0.776	5473	61576	17698347	16	0.177	3126	49427	6303	78960	2052	5069	440	1.87	Provide Anchors	0.25	0.25	0.25	16.32	16.32	3	12801	6303.06969	OK
50th Street	5001 East Ave, T-8	34.54	-118.04					2007		150	4,000,000		Unknown	30	3	2.5	iii	1.5	1.26	1.768	8.93	0.19	5.000	0.734	530144	33080971	7637298	11	135297	147203	135297	0.758	6103	68664	23796213	16	0.135	3223	50405	6902	85178	2052	5760	456	1.55	Provide Anchors	0.21	0.19	0.19	14.22	14.22	3	16514	6902.16829	OK
				Welded?	?	Concrete Ring Wall	None Shown	2007		150	4,000,000		Unknown		3	2.5	iii	1.5	1.26	1.768	8.93	0.19	5.000	0.734	530144	33080971	7637298	11	135297	147203	135297	0.758	6103	68664	23796213	16	0.135	3223	50405	6902	85178	2052	5760	456	1.55	Provide Anchors	0.21	0.19	0.19	14.22	14.22	3	16514	6902.16829	OK
Ana Verde	36800 Tovey Aveneu	34.55	-118.15	Welded	Not Flexible	Concrete Rink wall	Not Shown	1963		40	300,000		Unknown	32	3	2.5	iii	1.5	1.214	1.639	3.66	0.50	1.250	2.936	40212	2509253	1825481	12	9621	44129	9621	0.702	1327	16240	717357	22	0.355	255	5658	1351	17197	2120	1638	389	5.44	Provide Anchors	0.50	1.09	0.50	9.95	9.95	3	1363	1351.04608	OK
El Camino Lower	36809 El Camino Dr.	34.55	-118.13					1988		106	2,000,000		Unknown	32	3	2.5	iii	1.5	1.27	1.714	6.63	0.29	3.313	1.108	282391	17621228	6103267	12	67564	111862	67564	0.735	4665	55977	10784811	17	0.205	2215	38666	5164	68033	2120	4342	437	2.42	Provide Anchors	0.29	0.35	0.29	15.24	15.24	3	8916	5163.80732	OK
El Camino U.G[4]	36336 El Camino Road							1994		104	1,500,000		Unknown	26																																									
El Camino Upper	33030 Ridge Route Rd	34.54	-118.13	Welded	Flexible	Ringwall with Sand Inte	None Shown	1963		40	300,000		Unknown	32	3	2.5	iii	1.5	0.881	1.543	3.66	0.36	1.250	2.936	40212	2509253	1825481	12	9621	44129	9621	0.661	1249	15289	717357	22	0.258	185	4106	1263	15830	2120	1638	389	5.00	Provide Anchors	0.36	0.79	0.36	7.22	7.22	3	1371	1262.69341	OK
Walt Dahlitz	115 East Avenue S			Welded	Flexible	Concrete Ringwall, oil s	None Shown	1993		104	1,500,000		Unknown	31	3	2.5	iii	1.5	0.827	1.442	6.58	0.19	3.355	1.094	263341	16432470	5622265	12	65039	106378	65039	0.618	3621	42091	10122208	17	0.135	1362	22997	3869	47963	2086	4127	425	1.80	Provide Anchors	0.19	0.23	0.19	9.80	9.80	3	8455	3868.50122	OK
Well 14	36401 20th ST East			Weled?	Not Flexible	Concrete Ringwall, grav	3/4" 5' OC 8" embed			27	100,000		Unknown	22	3	2.5	iii	1.5	0.927	1.514	3.01	0.46	1.227	2.990	12596	786004	575712	8	4384	21166	4384	0.649	393	3325	220749	15	0.330	73	1119	400	3509	1758	760	275	4.80	Provide Anchors	0.46	1.23	0.46	6.24	6.24	3	435	399.685968	OK
Well 18 and 19	4640 Barrel Springs Road							1963		22	41,000		Unknown	30	3	2.5	iii	1.5	1.323	1.8	2.71	0.73	0.733	5.005	11404	711608	597846	13	2910	24053	2910	0.771	484	6262	120014	24	0.524	63	1513	488	6442	2052	845	369	11.47	Provide Anchors	0.73	2.17	0.73	8.06	8.06	3	387	488.300415	Needs Anchors
Well 5	1036 Barrel Spring Road							1963		30	1,463,945		Unknown	22	3	2.5	iii	1.5	1.311	1.782	3.18	0.62	1.364	2.691	15551	970375	680168	8	5412	23283	5412	0.764	546	4500	301560	15	0.442	133	1982	562	4918	1758	845	276	5.05	Provide Anchors	0.62	1.56	0.62	9.29	9.29	3	526	561.571023	Needs Anchors

1. Design spectral response acceleration parameters, S_{D1} and S_{DS}, have been determined using the Applied Technology Council's (ATC) web based hazard maps in accordance with the American Society of Civil Engineers Standard 7, Minimum Design Loads for Buildings and Other Structures (ASCE 7-10)

2. The Design spectrum for impulsive components, Sai and the Design Spectrum for convective components, Sac have been determined in accordance with Chapter 13 of the AWWA D100-11, Welded Carbon Steel Tnaks for Water Storage. These parameters are expressed as a percentage of the accelration due to gravity, g.

3. Facility list indicates that these facilities conatain 0 gallons and does not provide the overflow height, therefore we were not apple to determine the seismic demands on these structures.
4. AWWA D100 calculations do not apply to the El Camino Underground tank. Construction drawings are not available to perform an analysis at this time.
4. Minimum required freeboard is equal to the sloshing wave height for Use Group III and may be reduced for Use Group I and II

Hazards by Location

Search Information

Coordinates:	34.557353817153206, -118.11224470422972
Elevation:	2750 ft
Timestamp:	2021-04-09T16:22:17.704Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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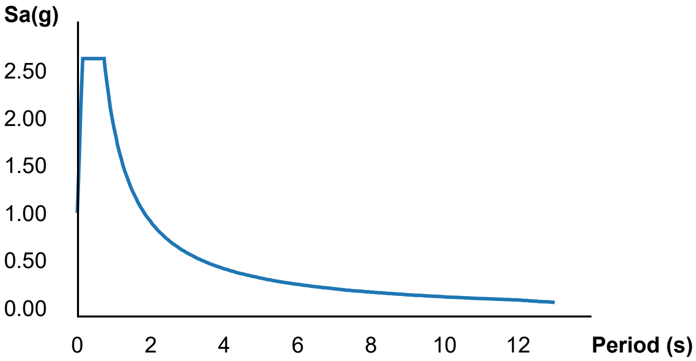
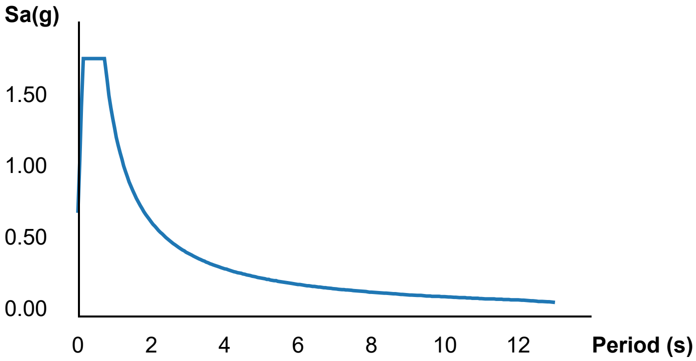
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.707	MCE_R ground motion (period=0.2s)
S_1	1.315	MCE_R ground motion (period=1.0s)
S_{MS}	2.707	Site-modified spectral acceleration value
S_{M1}	1.973	Site-modified spectral acceleration value
S_{DS}	1.805	Numeric seismic design value at 0.2s SA
S_{D1}	1.315	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.919	Coefficient of risk (0.2s)
CR_1	0.903	Coefficient of risk (1.0s)

PGA	1.045	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.045	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.418	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.719	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.707	Factored deterministic acceleration value (0.2s)
S1RT	1.605	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.778	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.315	Factored deterministic acceleration value (1.0s)
PGAd	1.045	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Coordinates:	34.53471326457233, -118.08343773439331
Elevation:	2968 ft
Timestamp:	2021-04-09T16:35:02.162Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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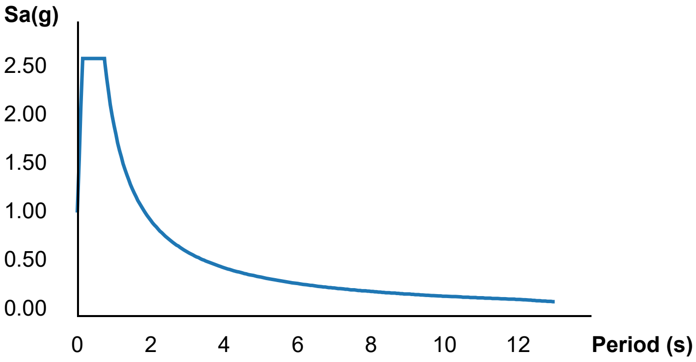
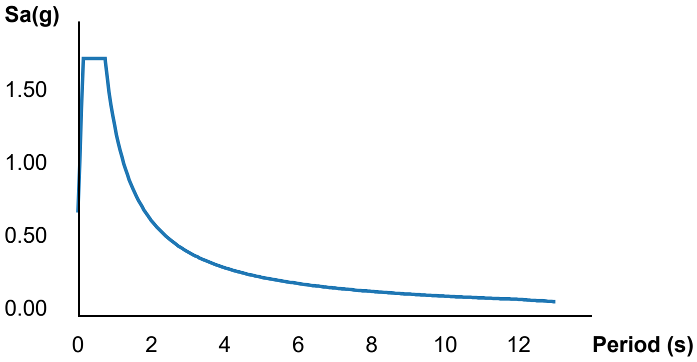
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.646	MCE_R ground motion (period=0.2s)
S_1	1.302	MCE_R ground motion (period=1.0s)
S_{MS}	2.646	Site-modified spectral acceleration value
S_{M1}	1.953	Site-modified spectral acceleration value
S_{DS}	1.764	Numeric seismic design value at 0.2s SA
S_{D1}	1.302	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.924	Coefficient of risk (0.2s)
CR_1	0.904	Coefficient of risk (1.0s)

PGA	1.018	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.018	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.282	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.552	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.646	Factored deterministic acceleration value (0.2s)
S1RT	1.53	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.694	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.302	Factored deterministic acceleration value (1.0s)
PGAd	1.018	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Address:	34547
Coordinates:	34.5497, -118.132821
Elevation:	2923 ft
Timestamp:	2021-04-08T21:00:34.329Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	III
Site Class:	D

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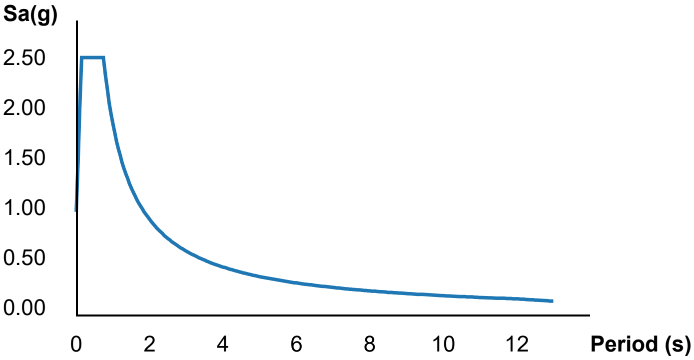
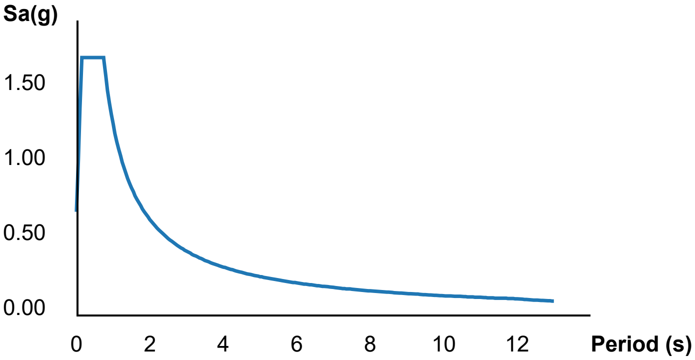
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.573	MCE_R ground motion (period=0.2s)
S_1	1.271	MCE_R ground motion (period=1.0s)
S_{MS}	2.573	Site-modified spectral acceleration value
S_{M1}	1.906	Site-modified spectral acceleration value
S_{DS}	1.715	Numeric seismic design value at 0.2s SA
S_{D1}	1.271	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.916	Coefficient of risk (0.2s)

CR_1	0.904	Coefficient of risk (1.0s)
PGA	0.987	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.987	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.429	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.743	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.573	Factored deterministic acceleration value (0.2s)
S1RT	1.614	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.785	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.271	Factored deterministic acceleration value (1.0s)
PGAd	0.987	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Coordinates:	34.559419345037064, -118.11618400870667
Elevation:	2750 ft
Timestamp:	2021-04-09T16:36:57.402Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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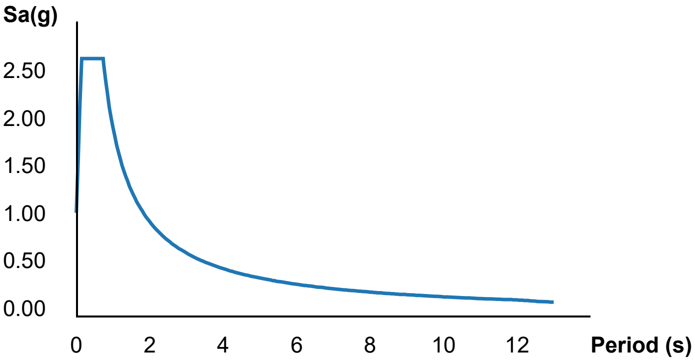
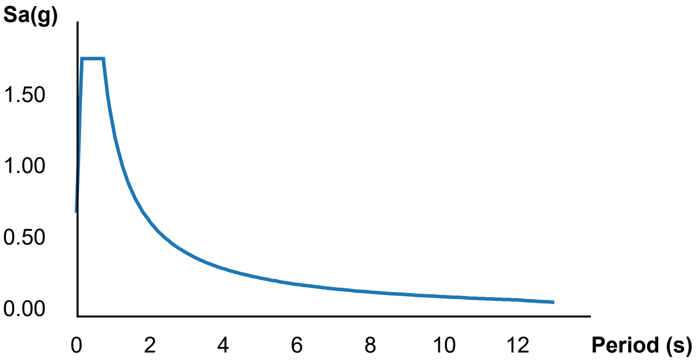
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.706	MCE_R ground motion (period=0.2s)
S_1	1.316	MCE_R ground motion (period=1.0s)
S_{MS}	2.706	Site-modified spectral acceleration value
S_{M1}	1.975	Site-modified spectral acceleration value
S_{DS}	1.804	Numeric seismic design value at 0.2s SA
S_{D1}	1.316	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.92	Coefficient of risk (0.2s)
CR_1	0.903	Coefficient of risk (1.0s)

PGA	1.046	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.046	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.37	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.665	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.706	Factored deterministic acceleration value (0.2s)
S1RT	1.58	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.749	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.316	Factored deterministic acceleration value (1.0s)
PGAd	1.046	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Coordinates:	34.55371, -118.087856
Elevation:	2752 ft
Timestamp:	2021-04-09T16:19:01.173Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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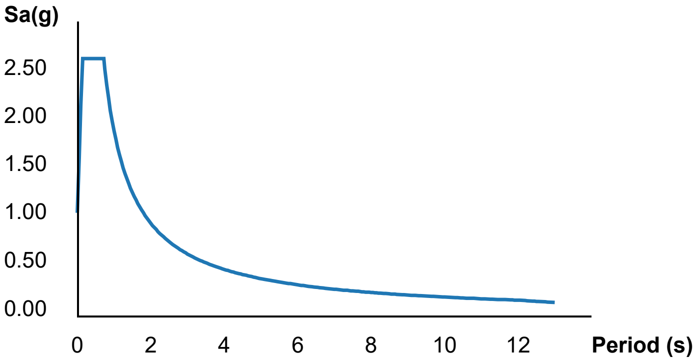
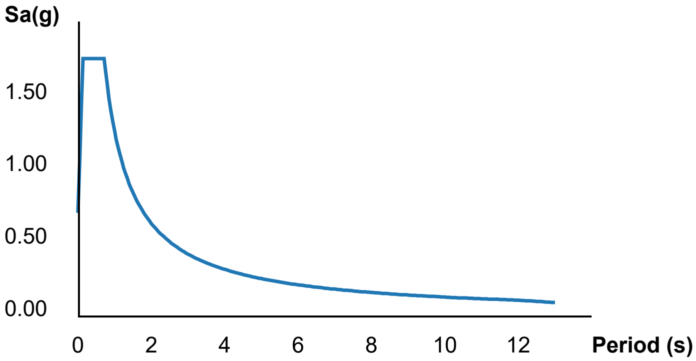
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.668	MCE_R ground motion (period=0.2s)
S_1	1.278	MCE_R ground motion (period=1.0s)
S_{MS}	2.668	Site-modified spectral acceleration value
S_{M1}	1.917	Site-modified spectral acceleration value
S_{DS}	1.779	Numeric seismic design value at 0.2s SA
S_{D1}	1.278	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.919	Coefficient of risk (0.2s)
CR_1	0.902	Coefficient of risk (1.0s)

PGA	1.031	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.031	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.432	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.737	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.668	Factored deterministic acceleration value (0.2s)
S1RT	1.613	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.788	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.278	Factored deterministic acceleration value (1.0s)
PGAd	1.031	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Coordinates:	34.55371, -118.087856
Elevation:	2752 ft
Timestamp:	2021-04-09T16:17:53.781Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	IV
Site Class:	D-default

Map data ©2021 Imagery ©2021 , CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

Basic Parameters

Name	Value	Description
S_S	2.404	MCE_R ground motion (period=0.2s)
S_1	1.025	MCE_R ground motion (period=1.0s)
S_{MS}	2.885	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.923	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

▾Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.874	Coefficient of risk (0.2s)
CR_1	0.869	Coefficient of risk (1.0s)
PGA	1.033	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	1.24	Site modified peak ground acceleration

T_L	12	Long-period transition period (s)
SsRT	3.008	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.441	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.404	Factored deterministic acceleration value (0.2s)
S1RT	1.294	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.489	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.025	Factored deterministic acceleration value (1.0s)
PGAd	1.033	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

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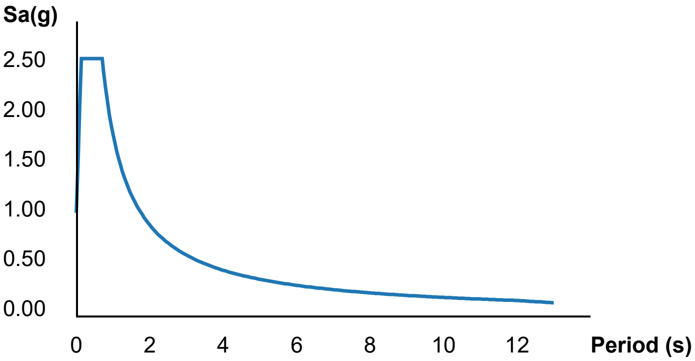
ATC Hazards by Location

Search Information

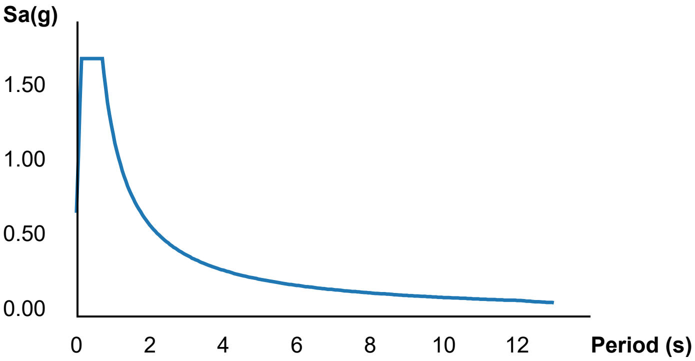
Coordinates:	34.544961034712664, -118.04877924893493
Elevation:	2740 ft
Timestamp:	2021-04-09T16:27:34.922Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

Map data ©2021 Imagery ©2021 , CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.584	MCE_R ground motion (period=0.2s)
S_1	1.214	MCE_R ground motion (period=1.0s)
S_{MS}	2.584	Site-modified spectral acceleration value
S_{M1}	1.821	Site-modified spectral acceleration value
S_{DS}	1.723	Numeric seismic design value at 0.2s SA
S_{D1}	1.214	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.921	Coefficient of risk (0.2s)
CR_1	0.905	Coefficient of risk (1.0s)

PGA	0.996	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.996	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.159	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.432	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.584	Factored deterministic acceleration value (0.2s)
S1RT	1.47	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.624	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.214	Factored deterministic acceleration value (1.0s)
PGAd	0.996	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Coordinates:	34.52903336279662, -118.04584351481934
Elevation:	2971 ft
Timestamp:	2021-04-09T16:31:06.633Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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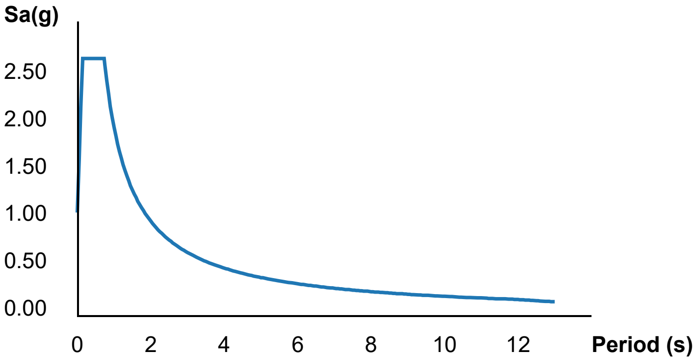
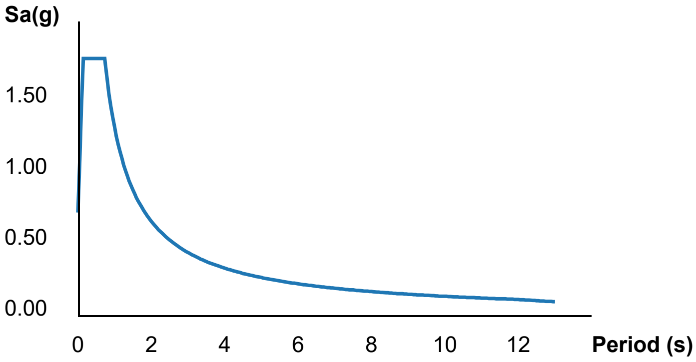
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.714	MCE_R ground motion (period=0.2s)
S_1	1.325	MCE_R ground motion (period=1.0s)
S_{MS}	2.714	Site-modified spectral acceleration value
S_{M1}	1.987	Site-modified spectral acceleration value
S_{DS}	1.81	Numeric seismic design value at 0.2s SA
S_{D1}	1.325	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.923	Coefficient of risk (0.2s)
CR_1	0.905	Coefficient of risk (1.0s)

PGA	1.048	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.048	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.142	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.404	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.714	Factored deterministic acceleration value (0.2s)
S1RT	1.461	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.614	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.325	Factored deterministic acceleration value (1.0s)
PGAd	1.048	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Coordinates:	34.536316858195896, -118.04017088147585
Elevation:	2825 ft
Timestamp:	2021-04-09T16:33:04.897Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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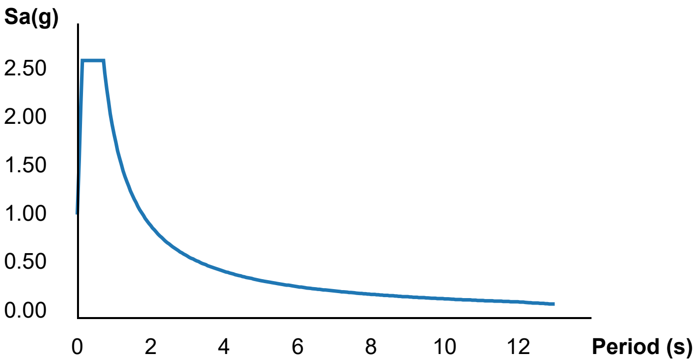
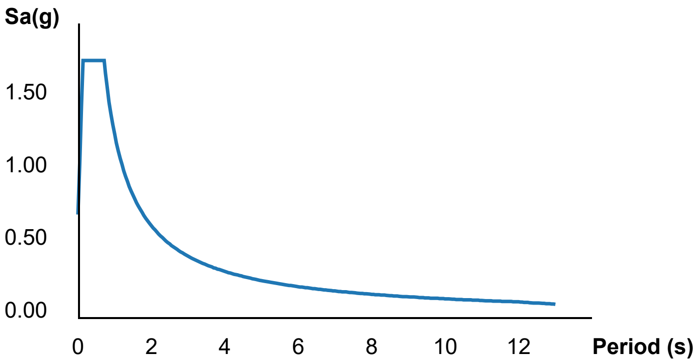
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.652	MCE$_R$ ground motion (period=0.2s)
S_1	1.26	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.652	Site-modified spectral acceleration value
S_{M1}	1.889	Site-modified spectral acceleration value
S_{DS}	1.768	Numeric seismic design value at 0.2s SA
S_{D1}	1.26	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.923	Coefficient of risk (0.2s)
CR_1	0.905	Coefficient of risk (1.0s)

PGA	1.024	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.024	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.121	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.381	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.652	Factored deterministic acceleration value (0.2s)
S1RT	1.449	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.602	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.26	Factored deterministic acceleration value (1.0s)
PGAd	1.024	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Coordinates:	34.54972773620536, -118.1502535834671
Elevation:	3116 ft
Timestamp:	2021-04-09T16:41:41.594Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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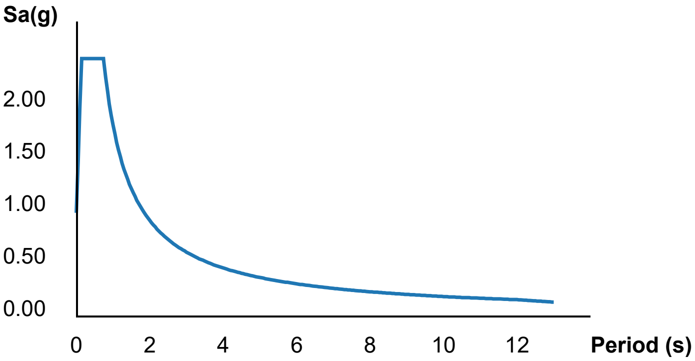
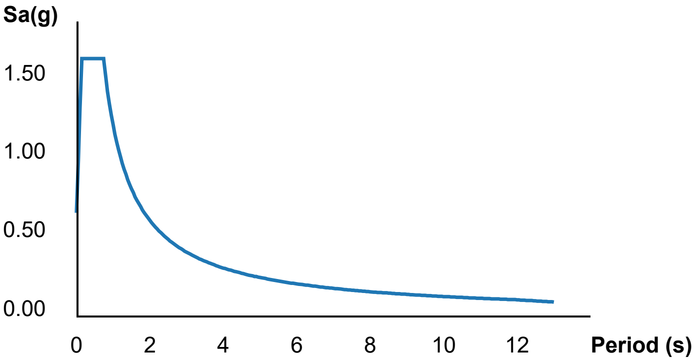
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.458	MCE$_R$ ground motion (period=0.2s)
S_1	1.214	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.458	Site-modified spectral acceleration value
S_{M1}	1.82	Site-modified spectral acceleration value
S_{DS}	1.639	Numeric seismic design value at 0.2s SA
S_{D1}	1.214	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.916	Coefficient of risk (0.2s)
CR_1	0.906	Coefficient of risk (1.0s)

PGA	0.945	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.945	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.335	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.642	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.458	Factored deterministic acceleration value (0.2s)
S1RT	1.566	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.728	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.214	Factored deterministic acceleration value (1.0s)
PGAd	0.945	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Address:	36809 El Camino Dr, Palmdale, CA 93551, USA
Coordinates:	34.54952240000001, -118.1326806
Elevation:	2925 ft
Timestamp:	2021-04-09T16:20:57.078Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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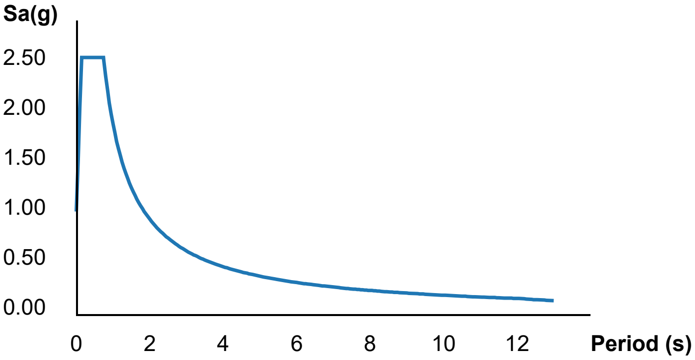
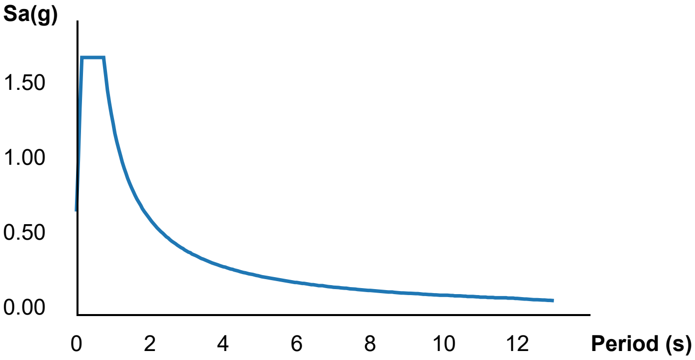
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.571	MCE$_R$ ground motion (period=0.2s)
S_1	1.27	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.571	Site-modified spectral acceleration value
S_{M1}	1.905	Site-modified spectral acceleration value
S_{DS}	1.714	Numeric seismic design value at 0.2s SA
S_{D1}	1.27	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.916	Coefficient of risk (0.2s)

CR_1	0.904	Coefficient of risk (1.0s)
PGA	0.986	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.986	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.426	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.74	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.571	Factored deterministic acceleration value (0.2s)
S1RT	1.613	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.783	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.27	Factored deterministic acceleration value (1.0s)
PGAd	0.986	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Coordinates:	34.53840630847815, -118.13288506137695
Elevation:	3359 ft
Timestamp:	2021-04-09T20:04:43.993Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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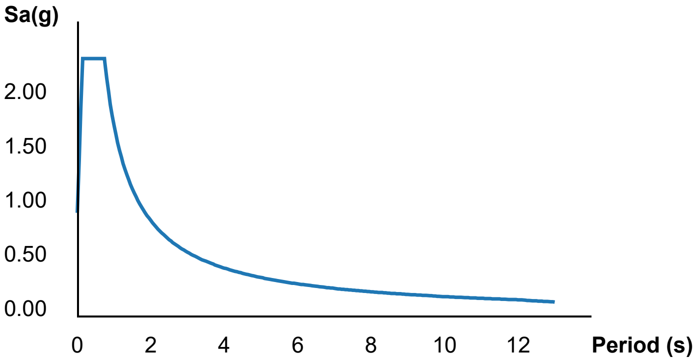
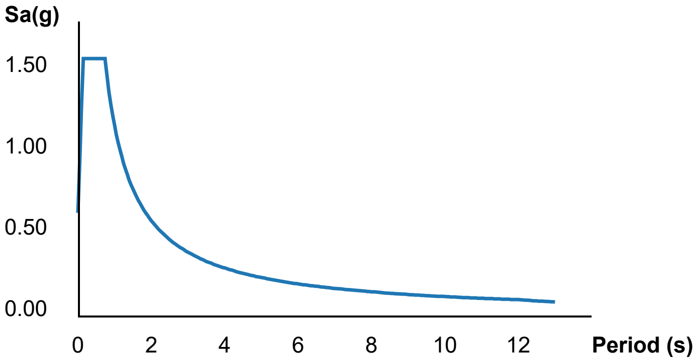
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.375	$\mathrm{MCE_R}$ ground motion (period=0.2s)
S_1	1.171	$\mathrm{MCE_R}$ ground motion (period=1.0s)
S_{MS}	2.375	Site-modified spectral acceleration value
S_{M1}	1.756	Site-modified spectral acceleration value
S_{DS}	1.583	Numeric seismic design value at 0.2s SA
S_{D1}	1.171	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.925	Coefficient of risk (0.2s)
CR_1	0.908	Coefficient of risk (1.0s)

PGA	0.917	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.917	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.236	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.499	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.375	Factored deterministic acceleration value (0.2s)
S1RT	1.505	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.657	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.171	Factored deterministic acceleration value (1.0s)
PGAd	0.917	Factored deterministic acceleration value (PGA)

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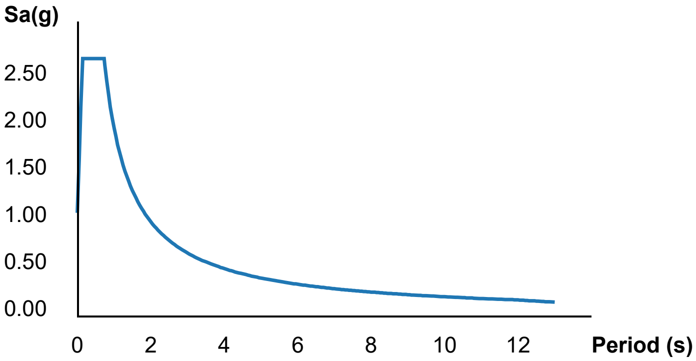
ATC Hazards by Location

Search Information

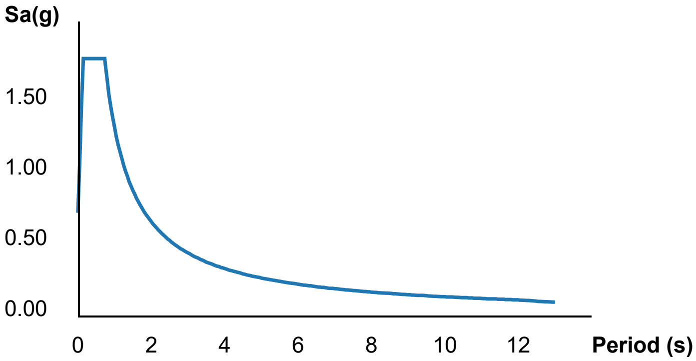
Coordinates:	34.56128566737895, -118.12898168848265
Elevation:	2924 ft
Timestamp:	2021-04-09T20:40:24.218Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

Map data ©2021 Imagery ©2021 , CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.733	MCE$_R$ ground motion (period=0.2s)
S_1	1.331	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.733	Site-modified spectral acceleration value
S_{M1}	1.997	Site-modified spectral acceleration value
S_{DS}	1.822	Numeric seismic design value at 0.2s SA
S_{D1}	1.331	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.92	Coefficient of risk (0.2s)
CR_1	0.904	Coefficient of risk (1.0s)

PGA	1.055	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.055	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.306	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.594	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.733	Factored deterministic acceleration value (0.2s)
S1RT	1.547	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.71	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.331	Factored deterministic acceleration value (1.0s)
PGAd	1.055	Factored deterministic acceleration value (PGA)

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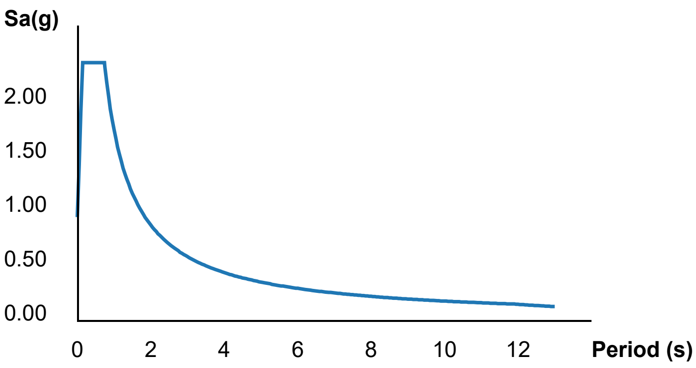
ATC Hazards by Location

Search Information

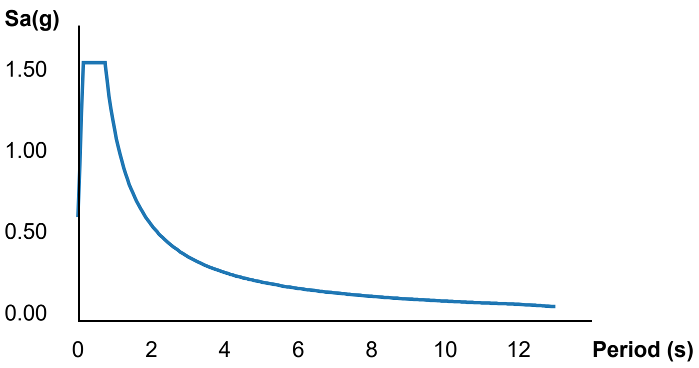
Address:	34547
Coordinates:	34.538438, -118.132863
Elevation:	3360 ft
Timestamp:	2021-04-08T22:06:10.243Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	III
Site Class:	D

Map data ©2021 Imagery ©2021 , Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.376	MCE$_R$ ground motion (period=0.2s)
S_1	1.171	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.376	Site-modified spectral acceleration value
S_{M1}	1.757	Site-modified spectral acceleration value
S_{DS}	1.584	Numeric seismic design value at 0.2s SA
S_{D1}	1.171	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.925	Coefficient of risk (0.2s)

CR_1	0.908	Coefficient of risk (1.0s)
PGA	0.917	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.917	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.236	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.5	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.376	Factored deterministic acceleration value (0.2s)
S1RT	1.505	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.657	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.171	Factored deterministic acceleration value (1.0s)
PGAd	0.917	Factored deterministic acceleration value (PGA)

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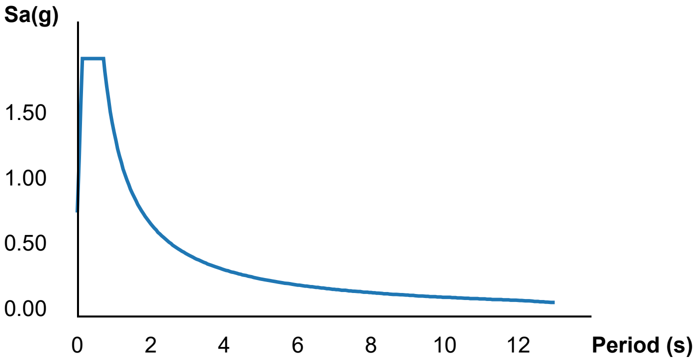
Hazards by Location

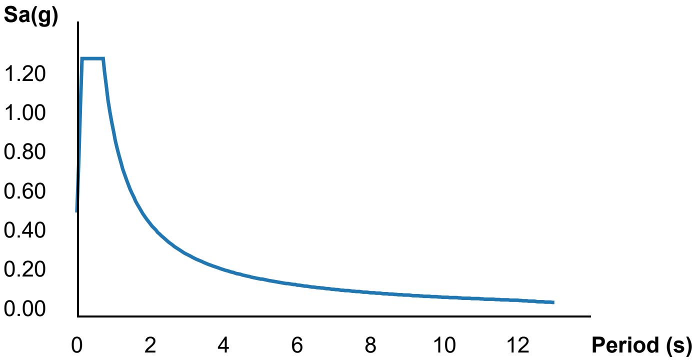
Search Information

Coordinates:	34.598759799594845, -118.09844223112182
Elevation:	2583 ft
Timestamp:	2021-04-09T20:48:48.917Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	1.971	MCE$_R$ ground motion (period=0.2s)
S_1	0.937	MCE$_R$ ground motion (period=1.0s)
S_{MS}	1.971	Site-modified spectral acceleration value
S_{M1}	1.406	Site-modified spectral acceleration value
S_{DS}	1.314	Numeric seismic design value at 0.2s SA
S_{D1}	0.937	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.937	Coefficient of risk (0.2s)
CR_1	0.911	Coefficient of risk (1.0s)

PGA	0.77	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.77	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	2.602	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.776	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.971	Factored deterministic acceleration value (0.2s)
S1RT	1.168	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.282	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.937	Factored deterministic acceleration value (1.0s)
PGAd	0.77	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Address:	1036 Barrel Spring Road palmdale, ca
Coordinates:	34.5457226, -118.1085956
Elevation:	2817 ft
Timestamp:	2021-05-04T20:11:47.998Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	III
Site Class:	D

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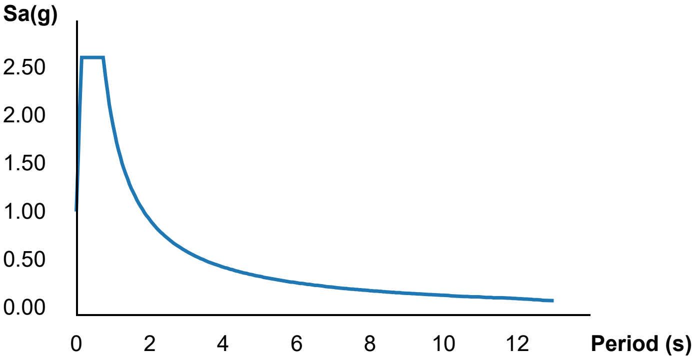
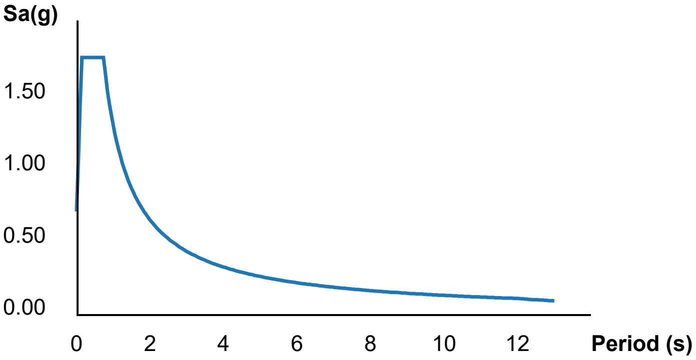
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.674	MCE_R ground motion (period=0.2s)
S_1	1.311	MCE_R ground motion (period=1.0s)
S_{MS}	2.674	Site-modified spectral acceleration value
S_{M1}	1.967	Site-modified spectral acceleration value
S_{DS}	1.782	Numeric seismic design value at 0.2s SA
S_{D1}	1.311	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.919	Coefficient of risk (0.2s)

CR_1	0.902	Coefficient of risk (1.0s)
PGA	1.029	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.029	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.49	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.799	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.674	Factored deterministic acceleration value (0.2s)
S1RT	1.643	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.821	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.311	Factored deterministic acceleration value (1.0s)
PGAd	1.029	Factored deterministic acceleration value (PGA)

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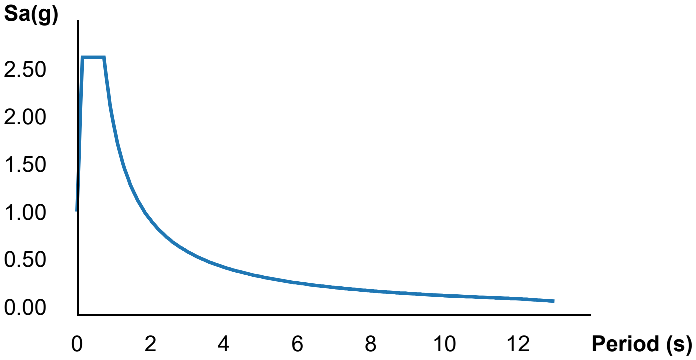
ATC Hazards by Location

Search Information

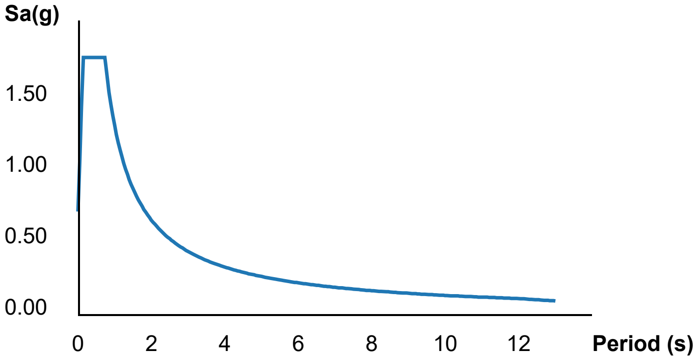
Address:	15 4640 Barrel Spring Road palmdale, ca
Coordinates:	34.5268275, -118.0540864
Elevation:	3036 ft
Timestamp:	2021-05-04T20:14:23.952Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	III
Site Class:	D

Map data ©2021 Imagery ©2021 , Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.7	MCE_R ground motion (period=0.2s)
S_1	1.323	MCE_R ground motion (period=1.0s)
S_{MS}	2.7	Site-modified spectral acceleration value
S_{M1}	1.984	Site-modified spectral acceleration value
S_{DS}	1.8	Numeric seismic design value at 0.2s SA
S_{D1}	1.323	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.924	Coefficient of risk (0.2s)

CR_1	0.905	Coefficient of risk (1.0s)
PGA	1.04	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.04	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.149	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.409	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.7	Factored deterministic acceleration value (0.2s)
S1RT	1.464	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.617	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.323	Factored deterministic acceleration value (1.0s)
PGAd	1.04	Factored deterministic acceleration value (PGA)

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		Coordinates		Tank Details											AWWA D100-11 Welded Carbon Steel Tanks Chapter 13 Seismic Design																																								
																Table 28	13.2.1	Table 24	ATC^1	Eqn 13-9^{1,2}	Eqn 13-22	Eqn 13-12/13^2				13-27	13-25/26	Eqn 13-28/29	Estimate	Estimate	Estimate	Eqn 13-16		Eqn 13-24/25		Eqn 13-30			Eqn 13-26	Eqn 13-31	Eqn 13-23	Eqn 13-37		Eqn 13-41	Eqn 13-36		Eqn 13-53/54			Eqn 13-52	Table 29		Eqn 13-57		
Tank Site	Address	Latitude	Longitude	Tank Type	Piping Connection	Footing	Anchorage	Date Built		Dia	Size	Bottom of the Knuckle	Top of Knuckle	Overflow Height	Freeboard Assumed to be 3 feet unless drawings indicate otherwise	Ri 3 if anchored 2.5 if unanchored	Seismic Use Group	I_E, assume that all tanks are Seismic Use Group III	Sd1, per ATC Seismic Hazard Maps	Sai, g Based on Sds from ASCE 7-10	Sloshing Period, Tc(Ss	Sac, g Based on Sd1 from ASCE 7-10	D/H	3.67*D/H	Volume ft^3 Vol = π*(Dia^2)/4	Total Weight, lbf W = Vol*62.4pcf	Impulsive Weight, Moves with Tank, (Wi)	Centroid of the lateral Force due to Sloshing (Xi), ft	Weight of the Roof (Wr), lbf	Weight of the Shell (Ws), lbf	Weight of the Floor (Wf), lbf	Implusive Design Acceleration (Ai)	Impulsive Lateral Force (Vi), kip	Overturning Moment due to Impulsive Lateral Force(Mi), ft-kip	Convective Weight (Wc), lbf	Centroid of the lateral force do to convective mass (Xc), ft	Convective Design Acceleration (Ai)	Convective Lateral Force (Vc), kip	Overturning Moment due to Convective Lateral Force(Mc), ft-kip	Design Lateral Force at the top of the foundation (Vf), kip	Design Overturning Moment (Ms), ft-kip Ms = √(Mi^2+Mc^2)	Maximum Resting Weight of the Tank Contents (wL), lbf/ft		Weight of the Tank Shell and Roof Resisting Overturning (wt), lbf/ft	Overturning Ratio, J	Anchor Requirements	Convective Design Accelaration, Af			Sloshing Wave Height (d), ft	Minimum Required Freeboard (D), ft	Actual Freeboard (Roof Height-Overflow)	Allowable Lateral Load, V$_{allow}$ (kip)	Total Lateral Seismic Load, Vt (Kip)	Sliding Check
3 MG Tank Site	850 East Avenue S	34.56	-118.11	Welded				1960		124	3,000,000		Unknown	34	3	2.5	iii	1.5	1.315	1.805	7.35	0.27	3.647	1.006	410594	25621040	8082906	13	92459	138480	92459	0.774	6503	82912	16424329	18	0.192	3150	57649	7226	100984	2185	5396	474	2.54	Provide Anchors	0.27	0.29	0.27	16.65	16.65	3	12851	7225.51729	OK
5 MG Tank	2404 Old Nadeau Road	34.53	-118.08							160	5,000,000		Unknown	20	3	2.5	iii	1.5	1.302	1.764	11.13	0.13	8.000	0.459	402124	25092529	3621894	8	153938	104550	153938	0.756	3050	22875	19810034	10	0.090	1784	18144	3533	29197	1676	4096	361	0.57	Tank Is Stable	0.18	0.13	0.13	10.08	10.08	3	12338	3533.2461	OK
6MG	641 East Ave S	34.56	-118.15					1999		206	6,000,000		Unknown	24	3	2.5	iii	1.5	1.316	1.804	13.03	0.09	8.583	0.428	799900	49913745	6714999	9	255176	160865	255176	0.773	5711	51395	39739497	12	0.066	2640	32159	6291	60628	1836	6328	446	0.64	Tank Is Stable	0.15	0.09	0.09	9.58	9.58	3	24349	6291.49113	OK
25th Street	26496 Cemetary Road	34.55	-118.09					1976		106	2,000,000		Unknown	30	3	2.5	iii	1.5	1.316	1.804	6.74	0.29	3.533	1.039	264742	16519902	5375203	11	67564	104870	67564	0.773	4341	48840	10436273	16	0.209	2185	35431	4860	60339	2052	4070	416	2.23	Provide Anchors	0.29	0.35	0.29	15.53	15.53	3	8304	4860.10557	OK
				Welded	Not Flexible	Ringwall with Sand Interior		1967		154	4,000,000		Unknown	30	3	2.5	iii	1.5	1.278	1.779	9.13	0.18	5.133	0.715	558795	34868813	7841520	11	142609	151052	142609	0.762	6311	71001	25267634	16	0.131	3318	51781	7130	87878	2052	5914	460	1.51	Uplift but Stable	0.21	0.18	0.18	14.15	14.15	3	17380	7130.09689	OK
45th Street	36510 45th St East	34.54	-118.05					1988		130	3,000,000		Unknown	30	3	2.5	iii	1.5	1.214	1.723	7.92	0.23	4.333	0.847	398197	24847485	6614006	11	101623	127961	101623	0.738	5129	57696	17074207	16	0.164	2805	44414	5845	72811	2052	4992	438	1.77	Provide Anchors	0.23	0.23	0.23	14.95	14.95	3	12488	5845.27581	OK
								1990		150	4,000,000		Unknown	32	3	2.5	iii	1.5	1.214	1.723	8.73	0.19	4.688	0.783	565487	35286369	8687384	12	135297	157017	135297	0.738	6731	80769	24894926	17	0.137	3398	56992	7540	98852	2120	6144	477	1.74	Provide Anchors	0.21	0.19	0.19	14.33	14.33	3	17687	7540.06677	OK
								1990		150	4,000,000		Unknown	32	3	2.5	iii	1.5	1.214	1.723	8.73	0.19	4.688	0.783	565487	35286369	8687384	12	135297	157017	135297	0.738	6731	80769	24894926	17	0.137	3398	56992	7540	98852	2120	6144	477	1.74	Provide Anchors	0.21	0.19	0.19	14.33	14.33	3	17687	7540.06677	OK
47th Street	35645 47th St East	34.53	-118.05					1967		106	2,000,000		Unknown	30	3	2.5	iii	1.5	1.325	1.81	6.74	0.30	3.533	1.039	264742	16519902	5375203	11	67564	104870	67564	0.776	4356	49003	10436273	16	0.211	2200	35674	4880	60613	2052	4070	416	2.24	Provide Anchors	0.30	0.35	0.30	15.64	15.64	3	8301	4879.72502	OK
								1990		132	3,000,000		Unknown	30	3	2.5	iii	1.5	1.325	1.81	8.02	0.25	4.400	0.834	410543	25617904	6716566	11	104774	129885	104774	0.776	5473	61576	17698347	16	0.177	3126	49427	6303	78960	2052	5069	440	1.87	Provide Anchors	0.25	0.25	0.25	16.32	16.32	3	12801	6303.06969	OK
50th Street	5001 East Ave, T-8	34.54	-118.04					2007		150	4,000,000		Unknown	30	3	2.5	iii	1.5	1.26	1.768	8.93	0.19	5.000	0.734	530144	33080971	7637298	11	135297	147203	135297	0.758	6103	68664	23796213	16	0.135	3223	50405	6902	85178	2052	5760	456	1.55	Provide Anchors	0.21	0.19	0.19	14.22	14.22	3	16514	6902.16829	OK
				Welded?	?	Concrete Ring Wall	None Shown	2007		150	4,000,000		Unknown		3	2.5	iii	1.5	1.26	1.768	8.93	0.19	5.000	0.734	530144	33080971	7637298	11	135297	147203	135297	0.758	6103	68664	23796213	16	0.135	3223	50405	6902	85178	2052	5760	456	1.55	Provide Anchors	0.21	0.19	0.19	14.22	14.22	3	16514	6902.16829	OK
Ana Verde	36800 Tovey Aveneu	34.55	-118.15	Welded	Not Flexible	Concrete Rink wall	Not Shown	1963		40	300,000		Unknown	32	3	2.5	iii	1.5	1.214	1.639	3.66	0.50	1.250	2.936	40212	2509253	1825481	12	9621	44129	9621	0.702	1327	16240	717357	22	0.355	255	5658	1351	17197	2120	1638	389	5.44	Provide Anchors	0.50	1.09	0.50	9.95	9.95	3	1363	1351.04608	OK
El Camino Lower	36809 El Camino Dr.	34.55	-118.13					1988		106	2,000,000		Unknown	32	3	2.5	iii	1.5	1.27	1.714	6.63	0.29	3.313	1.108	282391	17621228	6103267	12	67564	111862	67564	0.735	4665	55977	10784811	17	0.205	2215	38666	5164	68033	2120	4342	437	2.42	Provide Anchors	0.29	0.35	0.29	15.24	15.24	3	8916	5163.80732	OK
El Camino U.G^4	36336 El Camino Road							1994		104	1,500,000		Unknown	26																																									
El Camino Upper	33030 Ridge Route Rd	34.54	-118.13	Welded	Flexible	Ringwall with Sand Inte	None Shown	1963		40	300,000		Unknown	32	3	2.5	iii	1.5	0.881	1.543	3.66	0.36	1.250	2.936	40212	2509253	1825481	12	9621	44129	9621	0.661	1249	15289	717357	22	0.258	185	4106	1263	15830	2120	1638	389	5.00	Provide Anchors	0.36	0.79	0.36	7.22	7.22	3	1371	1262.69341	OK
Walt Dahlitz	115 East Avenue S			Welded	Flexible	Concrete Ringwall, oil s	None Shown	1993		104	1,500,000		Unknown	31	3	2.5	iii	1.5	0.827	1.442	6.58	0.19	3.355	1.094	263341	16432470	5622265	12	65039	106378	65039	0.618	3621	42091	10122208	17	0.135	1362	22997	3869	47963	2086	4127	425	1.80	Provide Anchors	0.19	0.23	0.19	9.80	9.80	3	8455	3868.50122	OK
Well 14	36401 20th ST East			Weled?	Not Flexible	Concrete Ringwall, grav	3/4" 5' OC 8" embed			27	100,000		Unknown	22	3	2.5	iii	1.5	0.927	1.514	3.01	0.46	1.227	2.990	12596	786004	575712	8	4384	21166	4384	0.649	393	3325	220749	15	0.330	73	1119	400	3509	1758	760	275	4.80	Provide Anchors	0.46	1.23	0.46	6.24	6.24	3	435	399.685968	OK
Well 18 and 19	4640 Barrel Springs Road							1963		22	41,000		Unknown	30	3	2.5	iii	1.5	1.323	1.8	2.71	0.73	0.733	5.005	11404	711608	597846	13	2910	24053	2910	0.771	484	6262	120014	24	0.524	63	1513	488	6442	2052	845	369	11.47	Provide Anchors	0.73	2.17	0.73	8.06	8.06	3	387	488.300415	Needs Anchors
Well 5	1036 Barrel Spring Road							1963		30	1,463,945		Unknown	22	3	2.5	iii	1.5	1.311	1.782	3.18	0.62	1.364	2.691	15551	970375	680168	8	5412	23283	5412	0.764	546	4500	301560	15	0.442	133	1982	562	4918	1758	845	276	5.05	Provide Anchors	0.62	1.56	0.62	9.29	9.29	3	526	561.571023	Needs Anchors

1. Design spectral response acceleration parameters, S_{D1} and S_{DS}, have been determined using the Applied Technology Council's (ATC) web based hazard maps in accordance with the American Society of Civil Engineers Standard 7, Minimum Design Loads for Buildings and Other Structures (ASCE 7-10)

2. The Design spectrum for impulsive components, Sai and the Design Spectrum for convective components, Sac have been determined in accordance with Chapter 13 of the AWWA D100-11, Welded Carbon Steel Tnaks for Water Storage. These parameters are expressed as a percentage of the accelration due to gravity, g.

3. Facility list indicates that these facilities conatain 0 gallons and does not provide the overflow height, therefore we were not apple to determine the seismic demands on these structures.
4. AWWA D100 calculations do not apply to the El Camino Underground tank. Construction drawings are not available to perform an analysis at this time.
4. Minimum required freeboard is equal to the sloshing wave height for Use Group III and may be reduced for Use Group I and II

Hazards by Location

Search Information

Coordinates:	34.557353817153206, -118.11224470422972
Elevation:	2750 ft
Timestamp:	2021-04-09T16:22:17.704Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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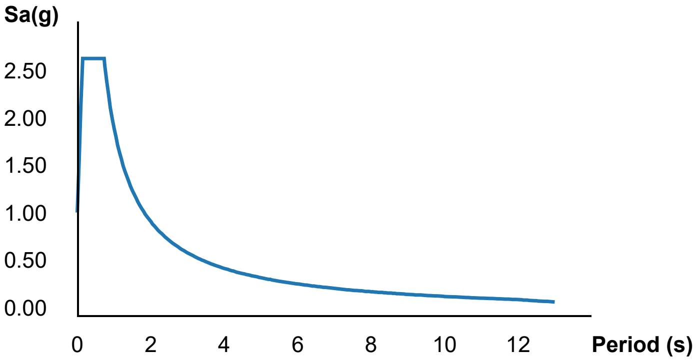
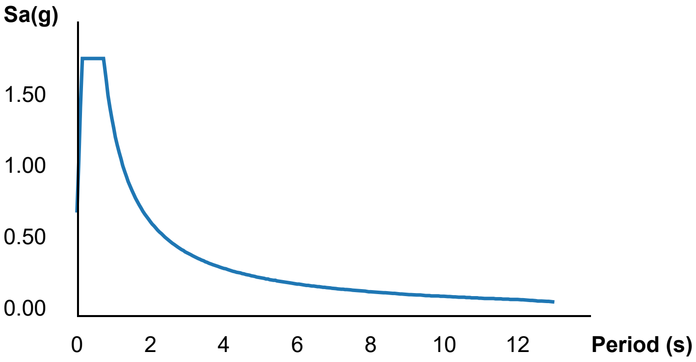
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.707	MCE$_R$ ground motion (period=0.2s)
S_1	1.315	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.707	Site-modified spectral acceleration value
S_{M1}	1.973	Site-modified spectral acceleration value
S_{DS}	1.805	Numeric seismic design value at 0.2s SA
S_{D1}	1.315	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.919	Coefficient of risk (0.2s)
CR_1	0.903	Coefficient of risk (1.0s)

PGA	1.045	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.045	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.418	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.719	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.707	Factored deterministic acceleration value (0.2s)
S1RT	1.605	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.778	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.315	Factored deterministic acceleration value (1.0s)
PGAd	1.045	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Coordinates:	34.53471326457233, -118.08343773439331
Elevation:	2968 ft
Timestamp:	2021-04-09T16:35:02.162Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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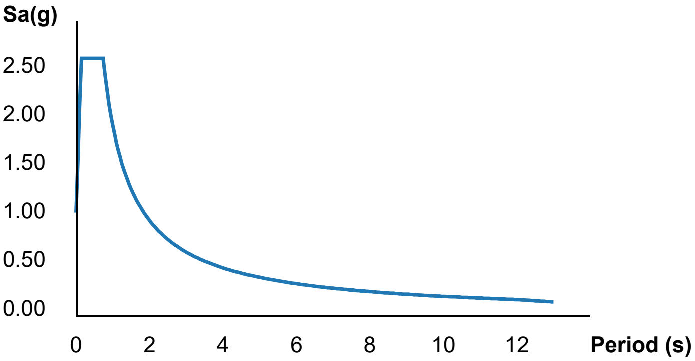
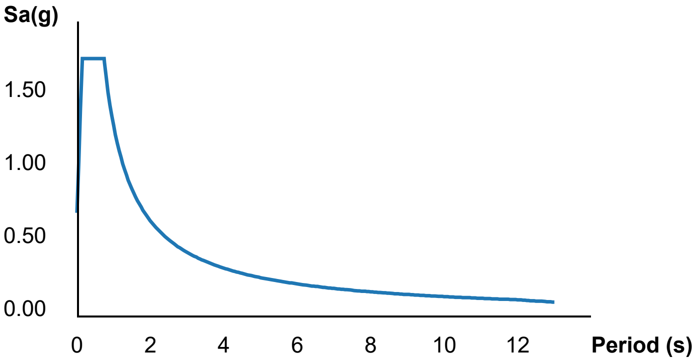
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.646	MCE_R ground motion (period=0.2s)
S_1	1.302	MCE_R ground motion (period=1.0s)
S_{MS}	2.646	Site-modified spectral acceleration value
S_{M1}	1.953	Site-modified spectral acceleration value
S_{DS}	1.764	Numeric seismic design value at 0.2s SA
S_{D1}	1.302	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.924	Coefficient of risk (0.2s)
CR_1	0.904	Coefficient of risk (1.0s)

PGA	1.018	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.018	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.282	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.552	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.646	Factored deterministic acceleration value (0.2s)
S1RT	1.53	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.694	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.302	Factored deterministic acceleration value (1.0s)
PGAd	1.018	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Address:	34547
Coordinates:	34.5497, -118.132821
Elevation:	2923 ft
Timestamp:	2021-04-08T21:00:34.329Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	III
Site Class:	D

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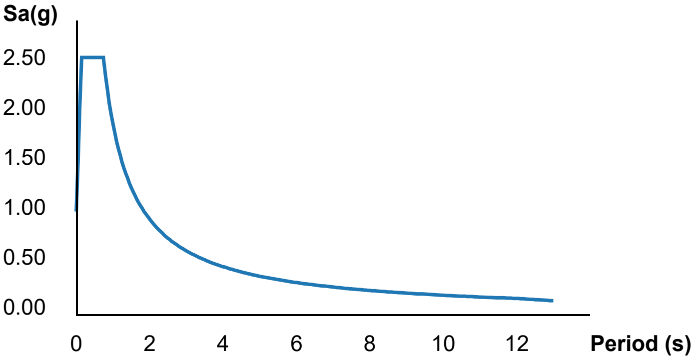
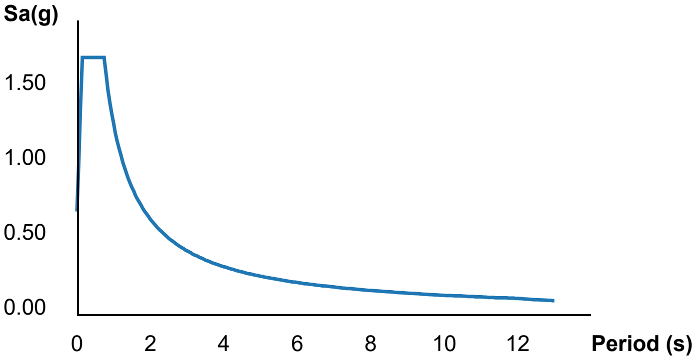
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.573	MCE$_R$ ground motion (period=0.2s)
S_1	1.271	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.573	Site-modified spectral acceleration value
S_{M1}	1.906	Site-modified spectral acceleration value
S_{DS}	1.715	Numeric seismic design value at 0.2s SA
S_{D1}	1.271	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.916	Coefficient of risk (0.2s)

CR_1	0.904	Coefficient of risk (1.0s)
PGA	0.987	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.987	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.429	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.743	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.573	Factored deterministic acceleration value (0.2s)
S1RT	1.614	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.785	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.271	Factored deterministic acceleration value (1.0s)
PGAd	0.987	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Coordinates:	34.559419345037064, -118.11618400870667
Elevation:	2750 ft
Timestamp:	2021-04-09T16:36:57.402Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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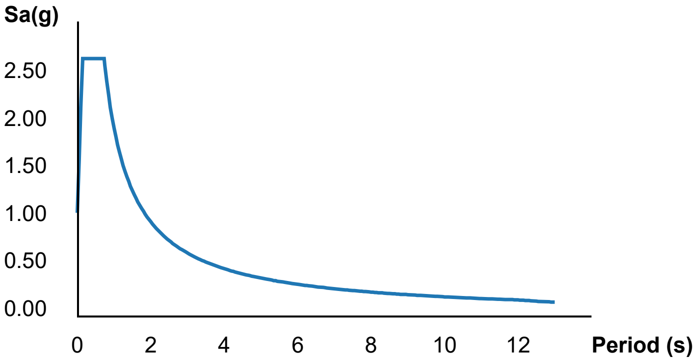
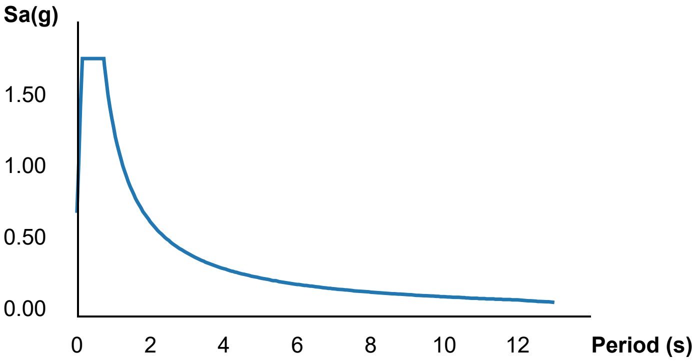
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.706	MCE$_R$ ground motion (period=0.2s)
S_1	1.316	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.706	Site-modified spectral acceleration value
S_{M1}	1.975	Site-modified spectral acceleration value
S_{DS}	1.804	Numeric seismic design value at 0.2s SA
S_{D1}	1.316	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.92	Coefficient of risk (0.2s)
CR_1	0.903	Coefficient of risk (1.0s)

PGA	1.046	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.046	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.37	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.665	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.706	Factored deterministic acceleration value (0.2s)
S1RT	1.58	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.749	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.316	Factored deterministic acceleration value (1.0s)
PGAd	1.046	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Coordinates:	34.55371, -118.087856
Elevation:	2752 ft
Timestamp:	2021-04-09T16:19:01.173Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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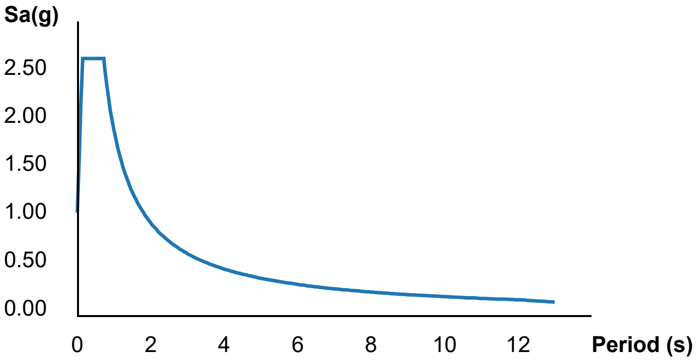
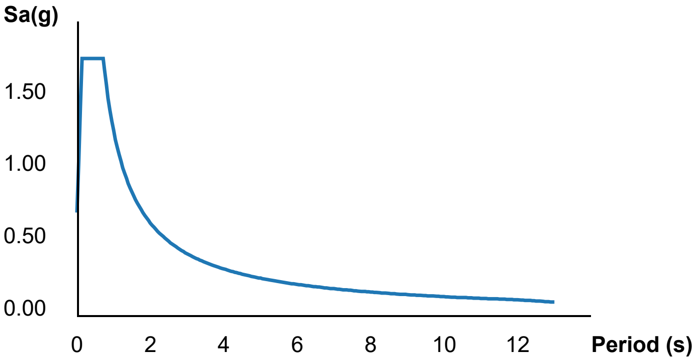
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.668	MCE_R ground motion (period=0.2s)
S_1	1.278	MCE_R ground motion (period=1.0s)
S_{MS}	2.668	Site-modified spectral acceleration value
S_{M1}	1.917	Site-modified spectral acceleration value
S_{DS}	1.779	Numeric seismic design value at 0.2s SA
S_{D1}	1.278	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.919	Coefficient of risk (0.2s)
CR_1	0.902	Coefficient of risk (1.0s)

PGA	1.031	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.031	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.432	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.737	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.668	Factored deterministic acceleration value (0.2s)
S1RT	1.613	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.788	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.278	Factored deterministic acceleration value (1.0s)
PGAd	1.031	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Coordinates:	34.55371, -118.087856
Elevation:	2752 ft
Timestamp:	2021-04-09T16:17:53.781Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	IV
Site Class:	D-default

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Basic Parameters

Name	Value	Description
S_S	2.404	MCE_R ground motion (period=0.2s)
S_1	1.025	MCE_R ground motion (period=1.0s)
S_{MS}	2.885	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.923	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

▾Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.874	Coefficient of risk (0.2s)
CR_1	0.869	Coefficient of risk (1.0s)
PGA	1.033	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	1.24	Site modified peak ground acceleration

T_L	12	Long-period transition period (s)
SsRT	3.008	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.441	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.404	Factored deterministic acceleration value (0.2s)
S1RT	1.294	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.489	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.025	Factored deterministic acceleration value (1.0s)
PGAd	1.033	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

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ATC Hazards by Location

Search Information

Coordinates:	34.544961034712664, -118.04877924893493
Elevation:	2740 ft
Timestamp:	2021-04-09T16:27:34.922Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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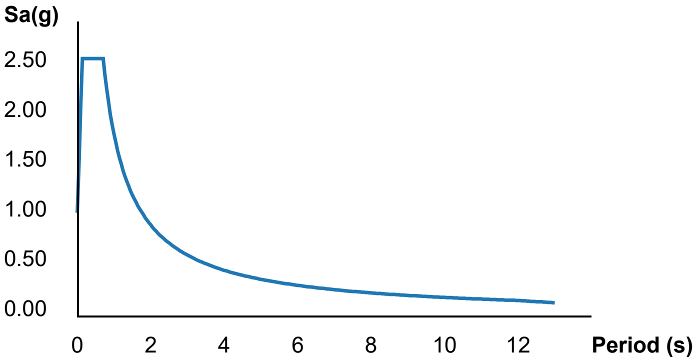
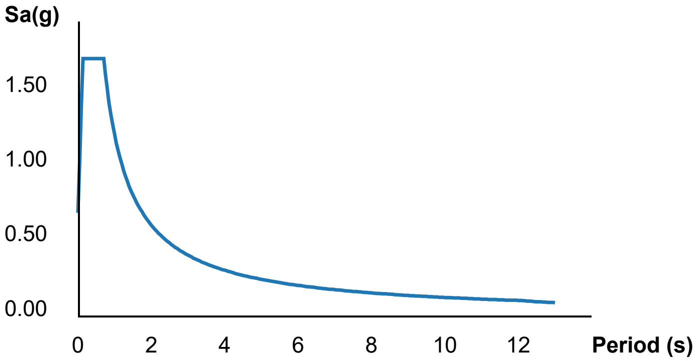
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.584	MCE$_R$ ground motion (period=0.2s)
S_1	1.214	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.584	Site-modified spectral acceleration value
S_{M1}	1.821	Site-modified spectral acceleration value
S_{DS}	1.723	Numeric seismic design value at 0.2s SA
S_{D1}	1.214	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.921	Coefficient of risk (0.2s)
CR_1	0.905	Coefficient of risk (1.0s)

PGA	0.996	MCE$_G$ peak ground acceleration
F$_{PGA}$	1	Site amplification factor at PGA
PGA$_M$	0.996	Site modified peak ground acceleration
T$_L$	12	Long-period transition period (s)
SsRT	3.159	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.432	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.584	Factored deterministic acceleration value (0.2s)
S1RT	1.47	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.624	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.214	Factored deterministic acceleration value (1.0s)
PGAd	0.996	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Coordinates:	34.52903336279662, -118.04584351481934
Elevation:	2971 ft
Timestamp:	2021-04-09T16:31:06.633Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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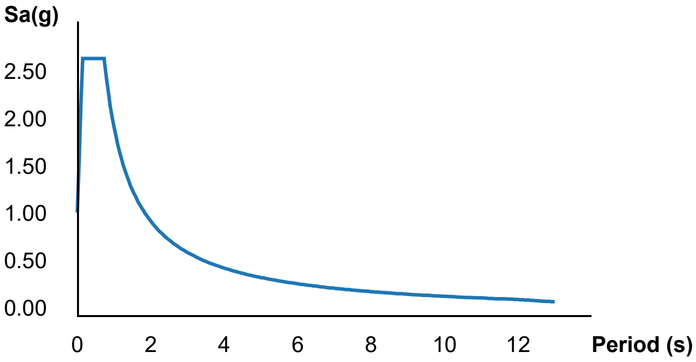
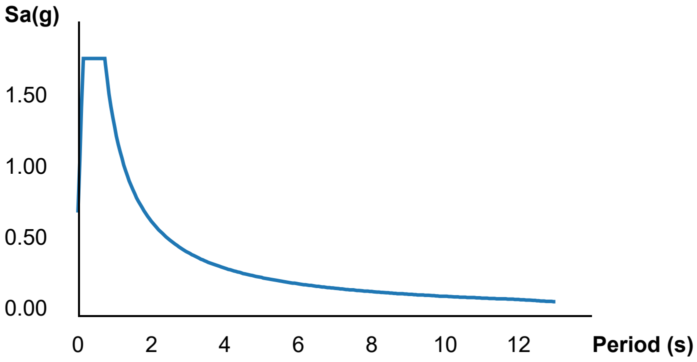
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.714	MCE_R ground motion (period=0.2s)
S_1	1.325	MCE_R ground motion (period=1.0s)
S_{MS}	2.714	Site-modified spectral acceleration value
S_{M1}	1.987	Site-modified spectral acceleration value
S_{DS}	1.81	Numeric seismic design value at 0.2s SA
S_{D1}	1.325	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.923	Coefficient of risk (0.2s)
CR_1	0.905	Coefficient of risk (1.0s)

PGA	1.048	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.048	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.142	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.404	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.714	Factored deterministic acceleration value (0.2s)
S1RT	1.461	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.614	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.325	Factored deterministic acceleration value (1.0s)
PGAd	1.048	Factored deterministic acceleration value (PGA)

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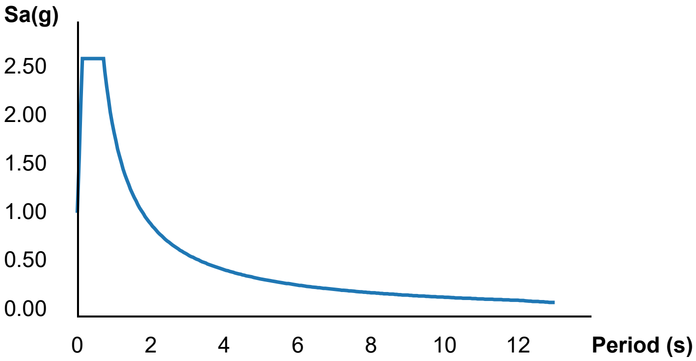
Hazards by Location

Search Information

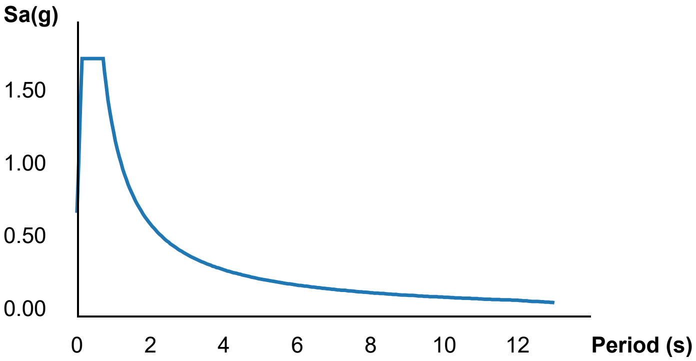
Coordinates:	34.536316858195896, -118.04017088147585
Elevation:	2825 ft
Timestamp:	2021-04-09T16:33:04.897Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

Map data ©2021 Imagery ©2021 , CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.652	MCE$_R$ ground motion (period=0.2s)
S_1	1.26	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.652	Site-modified spectral acceleration value
S_{M1}	1.889	Site-modified spectral acceleration value
S_{DS}	1.768	Numeric seismic design value at 0.2s SA
S_{D1}	1.26	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.923	Coefficient of risk (0.2s)
CR_1	0.905	Coefficient of risk (1.0s)

PGA	1.024	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.024	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.121	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.381	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.652	Factored deterministic acceleration value (0.2s)
S1RT	1.449	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.602	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.26	Factored deterministic acceleration value (1.0s)
PGAd	1.024	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Coordinates:	34.54972773620536, -118.1502535834671
Elevation:	3116 ft
Timestamp:	2021-04-09T16:41:41.594Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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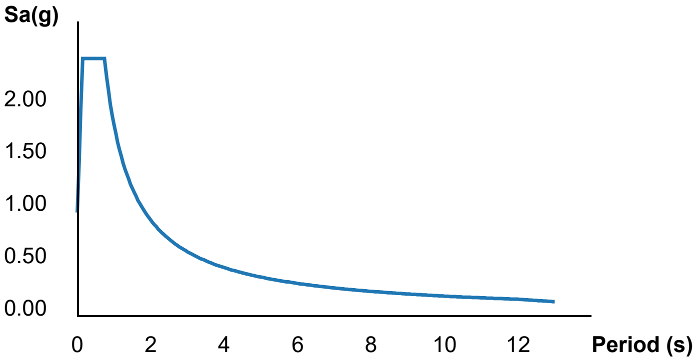
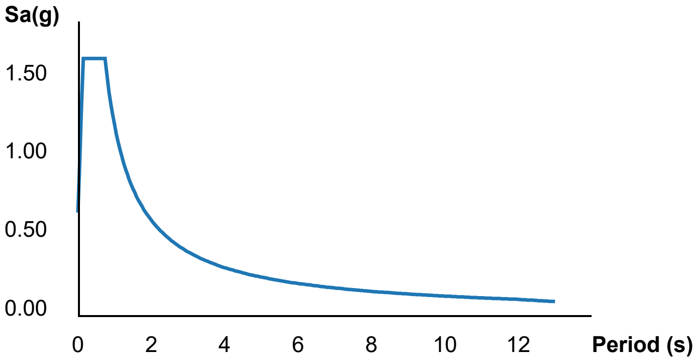
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.458	MCE$_R$ ground motion (period=0.2s)
S_1	1.214	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.458	Site-modified spectral acceleration value
S_{M1}	1.82	Site-modified spectral acceleration value
S_{DS}	1.639	Numeric seismic design value at 0.2s SA
S_{D1}	1.214	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.916	Coefficient of risk (0.2s)
CR_1	0.906	Coefficient of risk (1.0s)

PGA	0.945	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.945	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.335	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.642	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.458	Factored deterministic acceleration value (0.2s)
S1RT	1.566	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.728	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.214	Factored deterministic acceleration value (1.0s)
PGAd	0.945	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Address:	36809 El Camino Dr, Palmdale, CA 93551, USA
Coordinates:	34.54952240000001, -118.1326806
Elevation:	2925 ft
Timestamp:	2021-04-09T16:20:57.078Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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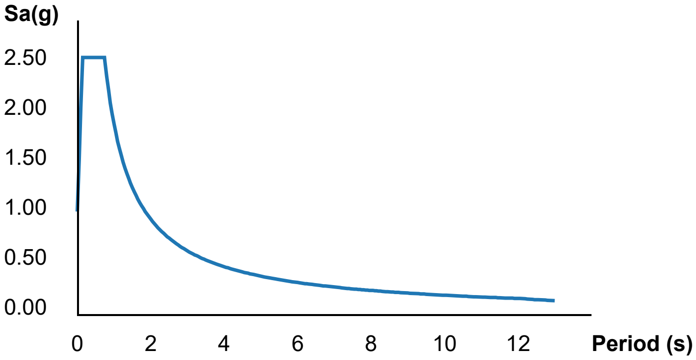
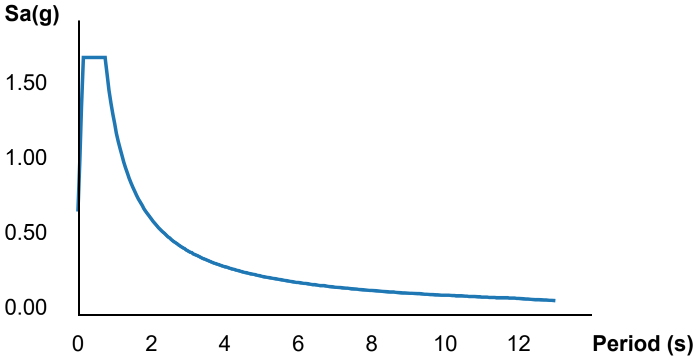
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.571	MCE$_R$ ground motion (period=0.2s)
S_1	1.27	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.571	Site-modified spectral acceleration value
S_{M1}	1.905	Site-modified spectral acceleration value
S_{DS}	1.714	Numeric seismic design value at 0.2s SA
S_{D1}	1.27	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.916	Coefficient of risk (0.2s)

CR_1	0.904	Coefficient of risk (1.0s)
PGA	0.986	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.986	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.426	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.74	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.571	Factored deterministic acceleration value (0.2s)
S1RT	1.613	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.783	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.27	Factored deterministic acceleration value (1.0s)
PGAd	0.986	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Coordinates:	34.53840630847815, -118.13288506137695
Elevation:	3359 ft
Timestamp:	2021-04-09T20:04:43.993Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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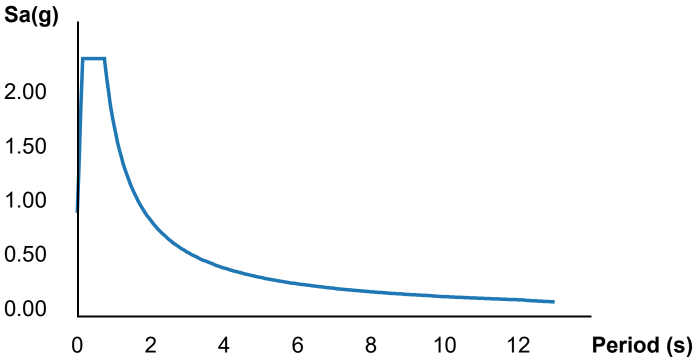
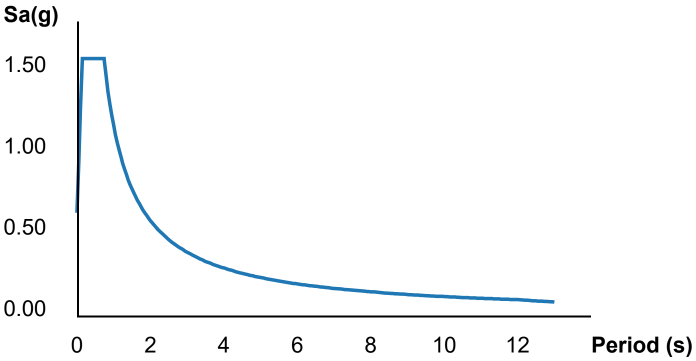
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.375	MCE$_R$ ground motion (period=0.2s)
S_1	1.171	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.375	Site-modified spectral acceleration value
S_{M1}	1.756	Site-modified spectral acceleration value
S_{DS}	1.583	Numeric seismic design value at 0.2s SA
S_{D1}	1.171	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.925	Coefficient of risk (0.2s)
CR_1	0.908	Coefficient of risk (1.0s)

PGA	0.917	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.917	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.236	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.499	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.375	Factored deterministic acceleration value (0.2s)
S1RT	1.505	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.657	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.171	Factored deterministic acceleration value (1.0s)
PGAd	0.917	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Coordinates:	34.56128566737895, -118.12898168848265
Elevation:	2924 ft
Timestamp:	2021-04-09T20:40:24.218Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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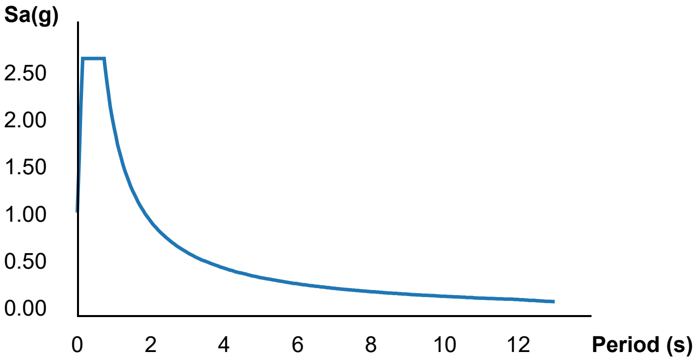
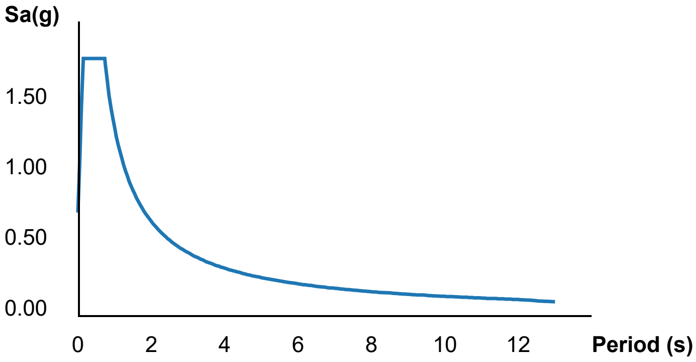
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.733	MCE_R ground motion (period=0.2s)
S_1	1.331	MCE_R ground motion (period=1.0s)
S_{MS}	2.733	Site-modified spectral acceleration value
S_{M1}	1.997	Site-modified spectral acceleration value
S_{DS}	1.822	Numeric seismic design value at 0.2s SA
S_{D1}	1.331	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.92	Coefficient of risk (0.2s)
CR_1	0.904	Coefficient of risk (1.0s)

PGA	1.055	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.055	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.306	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.594	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.733	Factored deterministic acceleration value (0.2s)
S1RT	1.547	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.71	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.331	Factored deterministic acceleration value (1.0s)
PGAd	1.055	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Address:	34547
Coordinates:	34.538438, -118.132863
Elevation:	3360 ft
Timestamp:	2021-04-08T22:06:10.243Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	III
Site Class:	D

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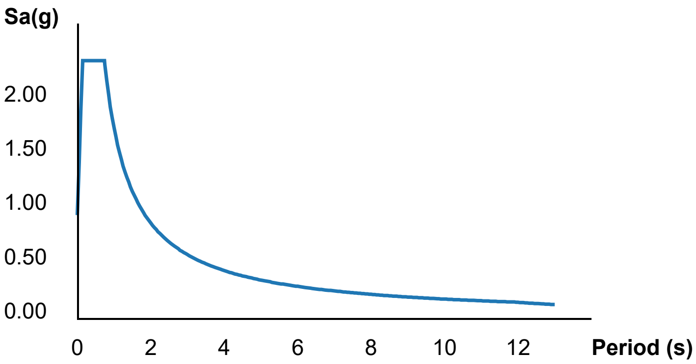
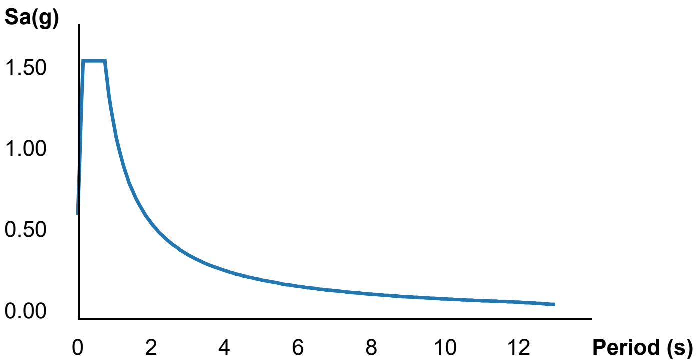
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.376	MCE$_R$ ground motion (period=0.2s)
S_1	1.171	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.376	Site-modified spectral acceleration value
S_{M1}	1.757	Site-modified spectral acceleration value
S_{DS}	1.584	Numeric seismic design value at 0.2s SA
S_{D1}	1.171	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.925	Coefficient of risk (0.2s)

CR_1	0.908	Coefficient of risk (1.0s)
PGA	0.917	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.917	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.236	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.5	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.376	Factored deterministic acceleration value (0.2s)
S1RT	1.505	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.657	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.171	Factored deterministic acceleration value (1.0s)
PGAd	0.917	Factored deterministic acceleration value (PGA)

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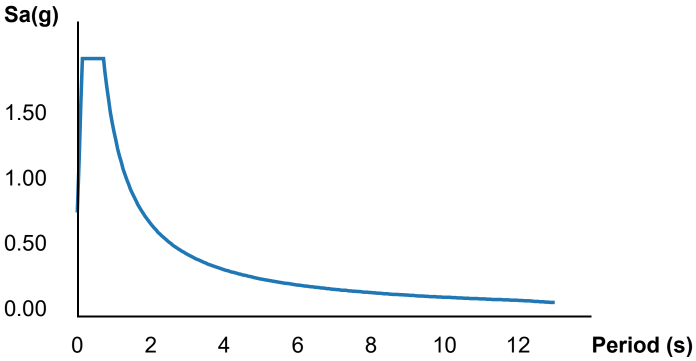
Hazards by Location

Search Information

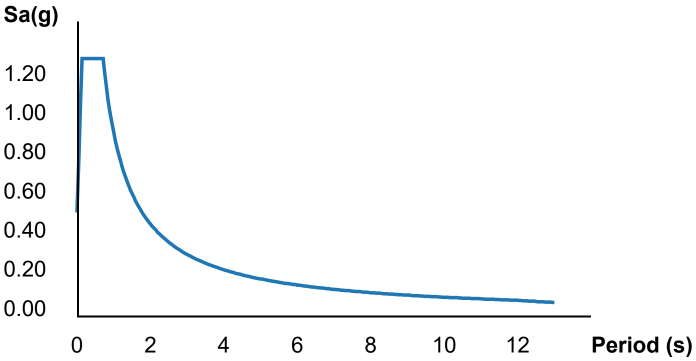
Coordinates:	34.598759799594845, -118.09844223112182
Elevation:	2583 ft
Timestamp:	2021-04-09T20:48:48.917Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

Map data ©2021 Imagery ©2021 , CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	1.971	MCE_R ground motion (period=0.2s)
S_1	0.937	MCE_R ground motion (period=1.0s)
S_{MS}	1.971	Site-modified spectral acceleration value
S_{M1}	1.406	Site-modified spectral acceleration value
S_{DS}	1.314	Numeric seismic design value at 0.2s SA
S_{D1}	0.937	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.937	Coefficient of risk (0.2s)
CR_1	0.911	Coefficient of risk (1.0s)

PGA	0.77	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.77	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	2.602	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.776	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.971	Factored deterministic acceleration value (0.2s)
S1RT	1.168	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.282	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.937	Factored deterministic acceleration value (1.0s)
PGAd	0.77	Factored deterministic acceleration value (PGA)

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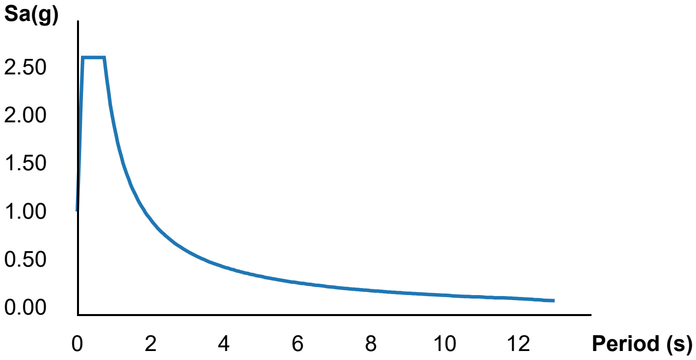
Hazards by Location

Search Information

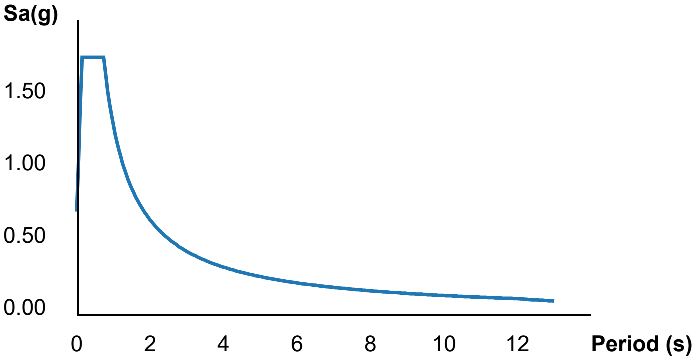
Address:	1036 Barrel Spring Road palmdale, ca
Coordinates:	34.5457226, -118.1085956
Elevation:	2817 ft
Timestamp:	2021-05-04T20:11:47.998Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	III
Site Class:	D

Map data ©2021 Imagery ©2021 , CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.674	MCE$_R$ ground motion (period=0.2s)
S_1	1.311	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.674	Site-modified spectral acceleration value
S_{M1}	1.967	Site-modified spectral acceleration value
S_{DS}	1.782	Numeric seismic design value at 0.2s SA
S_{D1}	1.311	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.919	Coefficient of risk (0.2s)

CR_1	0.902	Coefficient of risk (1.0s)
PGA	1.029	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.029	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.49	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.799	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.674	Factored deterministic acceleration value (0.2s)
S1RT	1.643	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.821	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.311	Factored deterministic acceleration value (1.0s)
PGAd	1.029	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Address:	15 4640 Barrel Spring Road palmdale, ca
Coordinates:	34.5268275, -118.0540864
Elevation:	3036 ft
Timestamp:	2021-05-04T20:14:23.952Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	III
Site Class:	D

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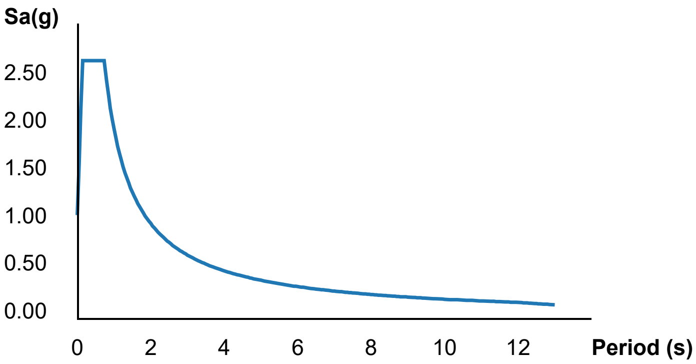
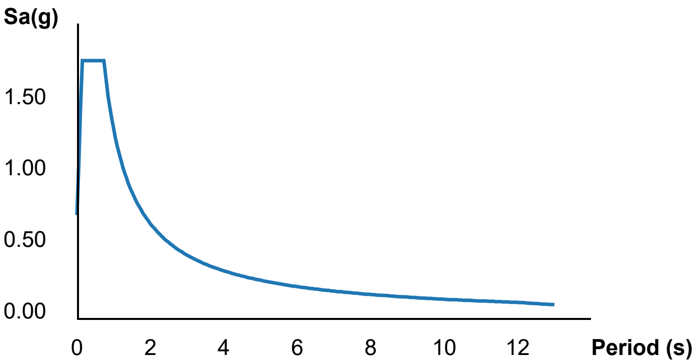
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.7	MCE$_R$ ground motion (period=0.2s)
S_1	1.323	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.7	Site-modified spectral acceleration value
S_{M1}	1.984	Site-modified spectral acceleration value
S_{DS}	1.8	Numeric seismic design value at 0.2s SA
S_{D1}	1.323	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.924	Coefficient of risk (0.2s)

CR_1	0.905	Coefficient of risk (1.0s)
PGA	1.04	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.04	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.149	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.409	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.7	Factored deterministic acceleration value (0.2s)
S1RT	1.464	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.617	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.323	Factored deterministic acceleration value (1.0s)
PGAd	1.04	Factored deterministic acceleration value (PGA)

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															AWWA D100-11 Welded Carbon Steel Tanks Chapter 13 Seismic Design																																								
		Coordinates		Tank Details												Table 28	13.2.1	Table 24	ATC[1]	Eqn 13-9[1,2]	Eqn 13-22	Eqn 13-12/13[2]				13-27	13-25/26	Eqn 13-28/29	Estimate	Estimate	Estimate	Eqn 13-16		Eqn 13-24/25		Eqn 13-30			Eqn 13-26	Eqn 13-31	Eqn 13-23	Eqn 13-37		Eqn 13-41	Eqn 13-36		Eqn 13-53/54			Eqn 13-52	Table 29		Eqn 13-57		
Tank Site	Address	Latitude	Longitude	*Tank Type*	*Piping Connection*	*Footing*	*Anchorage*	*Date Built*		*Dia*	*Size*	*Bottom of the Knuckle*	*Top of Knuckle*	*Overflow Height*	*Freeboard Assumed to be 3 feet unless drawings indicate otherwise*	*Ri 3 if anchored 2.5 if unanchored*	*Seismic Use Group*	*I_E, assume that all tanks are Seismic Use Group III*	*Sd1, per ATC Seismic Hazard Maps*	*Sai, g Based on Sds from ASCE 7-10*	Sloshing Period, Tc(Ss	*Sac, g Based on Sd1 from ASCE 7-10*	*D/H*	*3.67*D/H*	*Volume ft^3 Vol = π*(Dia^2)/4*	Total Weight, lbf W = Vol*62.4pcf	Impulsive Weight, Moves with Tank, (Wi)	Centroid of the lateral Force due to Sloshing (Xi), ft	Weight of the Roof (Wr), lbf	Weight of the Shell (Ws), lbf	Weight of the Floor (Wf), lbf	Implusive Design Acceleration (Ai)	Impulsive Lateral Force (Vi), kip	Overturning Moment due to Impulsive Lateral Force(Mi), ft-kip	Convective Weight (Wc), lbf	Centroid of the lateral force do to convective mass (Xc), ft	Convective Design Acceleration (Ai)	Convective Lateral Force (Vc), kip	Overturning Moment due to Convective Lateral Force(Mc), ft-kip	Design Lateral Force at the top of the foundation (Vf), kip	Design Overturning Moment (Ms), ft-kip Ms = $\surd(Mi^2+Mc^2)$	Maximum Resting Weight of the Tank Contents (wL), lbf/ft		Weight of the Tank Shell and Roof Resisting Overturning (wt), lbf/ft	Overturning Ratio, J	Anchor Requirements	Convective Design Accelaration, Af			Sloshing Wave Height (d), ft	Minimum Required Freeboard (D), ft	Actual Freeboard (Roof Height-Overflow)	Allowable Lateral Load, V_{allow} (kip)	Total Lateral Seismic Load, Vt (Kip)	Sliding Check
3 MG Tank Site	850 East Avenue S	34.56	-118.11	Welded				1960		124	3,000,000		Unknown	34	3	2.5	iii	1.5	1.315	1.805	7.35	0.27	3.647	1.006	410594	25621040	8082906	13	92459	138480	92459	0.774	6503	82912	16424329	18	0.192	3150	57649	7226	100984	2185	5396	474	2.54	Provide Anchors	0.27	0.29	0.27	16.65	16.65	3	12851	7225.51729	OK
5 MG Tank	2404 Old Nadeau Road	34.53	-118.08							160	5,000,000		Unknown	20	3	2.5	iii	1.5	1.302	1.764	11.13	0.13	8.000	0.459	402124	25092529	3621894	8	153938	104550	153938	0.756	3050	22875	19810034	10	0.090	1784	18144	3533	29197	1676	4096	361	0.57	Tank Is Stable	0.18	0.13	0.13	10.08	10.08	3	12338	3533.2461	OK
6MG	641 East Ave S	34.56	-118.15					1999		206	6,000,000		Unknown	24	3	2.5	iii	1.5	1.316	1.804	13.03	0.09	8.583	0.428	799900	49913745	6714999	9	255176	160865	255176	0.773	5711	51395	39739497	12	0.066	2640	32159	6291	60628	1836	6328	446	0.64	Tank Is Stable	0.15	0.09	0.09	9.58	9.58	3	24349	6291.49113	OK
25th Street	26496 Cemetary Road	34.55	-118.09					1976		106	2,000,000		Unknown	30	3	2.5	iii	1.5	1.316	1.804	6.74	0.29	3.533	1.039	264742	16519902	5375203	11	67564	104870	67564	0.773	4341	48840	10436273	16	0.209	2185	35431	4860	60339	2052	4070	416	2.23	Provide Anchors	0.29	0.35	0.29	15.53	15.53	3	8304	4860.10557	OK
				Welded	Not Flexible	Ringwall with Sand Interior		1967		154	4,000,000		Unknown	30	3	2.5	iii	1.5	1.278	1.779	9.13	0.18	5.133	0.715	558795	34868813	7841520	11	142609	151052	142609	0.762	6311	71001	25267634	16	0.131	3318	51781	7130	87878	2052	5914	460	1.51	Uplift but Stable	0.21	0.18	0.18	14.15	14.15	3	17380	7130.09689	OK
45th Street	36510 45th St East	34.54	-118.05					1988		130	3,000,000		Unknown	30	3	2.5	iii	1.5	1.214	1.723	7.92	0.23	4.333	0.847	398197	24847485	6614006	11	101623	127961	101623	0.738	5129	57696	17074207	16	0.164	2805	44414	5845	72811	2052	4992	438	1.77	Provide Anchors	0.23	0.23	0.23	14.95	14.95	3	12488	5845.27581	OK
								1990		150	4,000,000		Unknown	32	3	2.5	iii	1.5	1.214	1.723	8.73	0.19	4.688	0.783	565487	35286369	8687384	12	135297	157017	135297	0.738	6731	80769	24894926	17	0.137	3398	56992	7540	98852	2120	6144	477	1.74	Provide Anchors	0.21	0.19	0.19	14.33	14.33	3	17687	7540.06677	OK
								1990		150	4,000,000		Unknown	32	3	2.5	iii	1.5	1.214	1.723	8.73	0.19	4.688	0.783	565487	35286369	8687384	12	135297	157017	135297	0.738	6731	80769	24894926	17	0.137	3398	56992	7540	98852	2120	6144	477	1.74	Provide Anchors	0.21	0.19	0.19	14.33	14.33	3	17687	7540.06677	OK
47th Street	35645 47th St East	34.53	-118.05					1967		106	2,000,000		Unknown	30	3	2.5	iii	1.5	1.325	1.81	6.74	0.30	3.533	1.039	264742	16519902	5375203	11	67564	104870	67564	0.776	4356	49003	10436273	16	0.211	2200	35674	4880	60613	2052	4070	416	2.24	Provide Anchors	0.30	0.35	0.30	15.64	15.64	3	8301	4879.72502	OK
								1990		132	3,000,000		Unknown	30	3	2.5	iii	1.5	1.325	1.81	8.02	0.25	4.400	0.834	410543	25617904	6716566	11	104774	129885	104774	0.776	5473	61576	17698347	16	0.177	3126	49427	6303	78960	2052	5069	440	1.87	Provide Anchors	0.25	0.25	0.25	16.32	16.32	3	12801	6303.06969	OK
50th Street	5001 East Ave, T-8	34.54	-118.04					2007		150	4,000,000		Unknown	30	3	2.5	iii	1.5	1.26	1.768	8.93	0.19	5.000	0.734	530144	33080971	7637298	11	135297	147203	135297	0.758	6103	68664	23796213	16	0.135	3223	50405	6902	85178	2052	5760	456	1.55	Provide Anchors	0.21	0.19	0.19	14.22	14.22	3	16514	6902.16829	OK
				Welded?	?	Concrete Ring Wall	None Shown	2007		150	4,000,000		Unknown		3	2.5	iii	1.5	1.26	1.768	8.93	0.19	5.000	0.734	530144	33080971	7637298	11	135297	147203	135297	0.758	6103	68664	23796213	16	0.135	3223	50405	6902	85178	2052	5760	456	1.55	Provide Anchors	0.21	0.19	0.19	14.22	14.22	3	16514	6902.16829	OK
Ana Verde	36800 Tovey Aveneu	34.55	-118.15	Welded	Not Flexible	Concrete Rink wall	Not Shown	1963		40	300,000		Unknown	32	3	2.5	iii	1.5	1.214	1.639	3.66	0.50	1.250	2.936	40212	2509253	1825481	12	9621	44129	9621	0.702	1327	16240	717357	22	0.355	255	5658	1351	17197	2120	1638	389	5.44	Provide Anchors	0.50	1.09	0.50	9.95	9.95	3	1363	1351.04608	OK
El Camino Lower	36809 El Camino Dr.	34.55	-118.13					1988		106	2,000,000		Unknown	32	3	2.5	iii	1.5	1.27	1.714	6.63	0.29	3.313	1.108	282391	17621228	6103267	12	67564	111862	67564	0.735	4665	55977	10784811	17	0.205	2215	38666	5164	68033	2120	4342	437	2.42	Provide Anchors	0.29	0.35	0.29	15.24	15.24	3	8916	5163.80732	OK
El Camino U.G^4	36336 El Camino Road							1994		104	1,500,000		Unknown	26																																									
El Camino Upper	33030 Ridge Route Rd	34.54	-118.13	Welded	Flexible	Ringwall with Sand Inte	None Shown	1963		40	300,000		Unknown	32	3	2.5	iii	1.5	0.881	1.543	3.66	0.36	1.250	2.936	40212	2509253	1825481	12	9621	44129	9621	0.661	1249	15289	717357	22	0.258	185	4106	1263	15830	2120	1638	389	5.00	Provide Anchors	0.36	0.79	0.36	7.22	7.22	3	1371	1262.69341	OK
Walt Dahlitz	115 East Avenue S			Welded	Flexible	Concrete Ringwall, oil s	None Shown	1993		104	1,500,000		Unknown	31	3	2.5	iii	1.5	0.827	1.442	6.58	0.19	3.355	1.094	263341	16432470	5622265	12	65039	106378	65039	0.618	3621	42091	10122208	17	0.135	1362	22997	3869	47963	2086	4127	425	1.80	Provide Anchors	0.19	0.23	0.19	9.80	9.80	3	8455	3868.50122	OK
Well 14	36401 20th ST East			Weled?	Not Flexible	Concrete Ringwall, grav	3/4" 5' OC 8" embed			27	100,000		Unknown	22	3	2.5	iii	1.5	0.927	1.514	3.01	0.46	1.227	2.990	12596	786004	575712	8	4384	21166	4384	0.649	393	3325	220749	15	0.330	73	1119	400	3509	1758	760	275	4.80	Provide Anchors	0.46	1.23	0.46	6.24	6.24	3	435	399.685968	OK
Well 18 and 19	4640 Barrel Springs Road							1963		22	41,000		Unknown	30	3	2.5	iii	1.5	1.323	1.8	2.71	0.73	0.733	5.005	11404	711608	597846	13	2910	24053	2910	0.771	484	6262	120014	24	0.524	63	1513	488	6442	2052	845	369	11.47	Provide Anchors	0.73	2.17	0.73	8.06	8.06	3	387	488.300415	Needs Anchors
Well 5	1036 Barrel Spring Road							1963		30	1,463,945		Unknown	22	3	2.5	iii	1.5	1.311	1.782	3.18	0.62	1.364	2.691	15551	970375	680168	8	5412	23283	5412	0.764	546	4500	301560	15	0.442	133	1982	562	4918	1758	845	276	5.05	Provide Anchors	0.62	1.56	0.62	9.29	9.29	3	526	561.571023	Needs Anchors

1. Design spectral response acceleration parameters, S_{D1} and S_{DS}, have been determined using the Applied Technology Council's (ATC) web based hazard maps in accordance with the American Society of Civil Engineers Standard 7, Minimum Design Loads for Buildings and Other Structures (ASCE 7-10)

2. The Design spectrum for impulsive components, Sai and the Design Spectrum for convective components, Sac have been determined in accordance with Chapter 13 of the AWWA D100-11, Welded Carbon Steel Tnaks for Water Storage. These parameters are expressed as a percentage of the accelration due to gravity, g.

3. Facility list indicates that these facilities conatain 0 gallons and does not provide the overflow height, therefore we were not apple to determine the seismic demands on these structures.
4. AWWA D100 calculations do not apply to the El Camino Underground tank. Construction drawings are not available to perform an analysis at this time.
4. Minimum required freeboard is equal to the sloshing wave height for Use Group III and may be reduced for Use Group I and II

Hazards by Location

Search Information

Coordinates: 34.557353817153206, -118.11224470422972

Elevation: 2750 ft

Timestamp: 2021-04-09T16:22:17.704Z

Hazard Type: Seismic

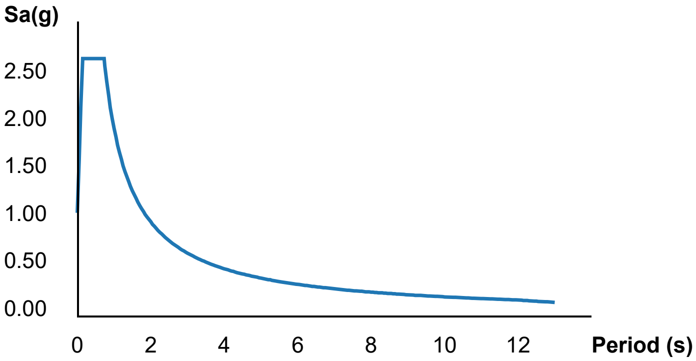
Reference Document: ASCE7-10

Risk Category: IV

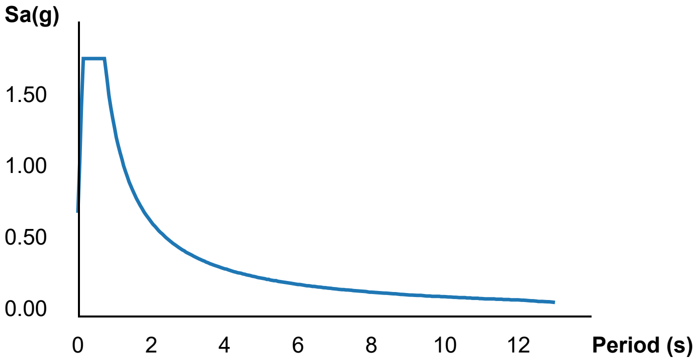
Site Class: D

Map data ©2021 Imagery ©2021 , CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.707	MCE$_R$ ground motion (period=0.2s)
S_1	1.315	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.707	Site-modified spectral acceleration value
S_{M1}	1.973	Site-modified spectral acceleration value
S_{DS}	1.805	Numeric seismic design value at 0.2s SA
S_{D1}	1.315	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.919	Coefficient of risk (0.2s)
CR_1	0.903	Coefficient of risk (1.0s)

PGA	1.045	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.045	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.418	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.719	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.707	Factored deterministic acceleration value (0.2s)
S1RT	1.605	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.778	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.315	Factored deterministic acceleration value (1.0s)
PGAd	1.045	Factored deterministic acceleration value (PGA)

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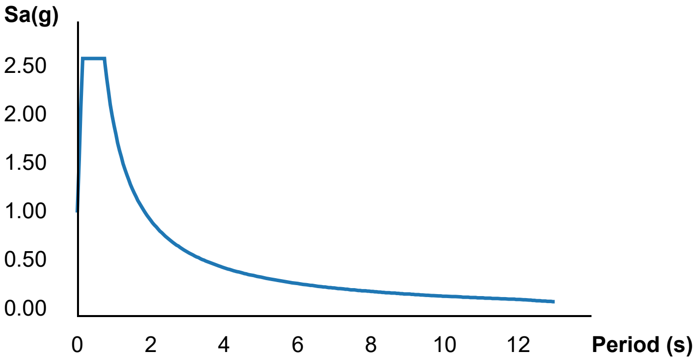
Hazards by Location

Search Information

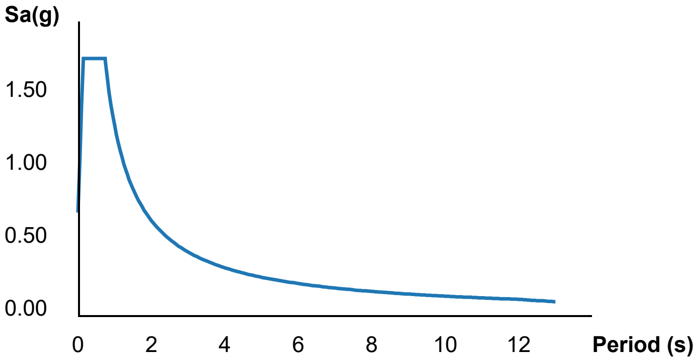
Coordinates:	34.53471326457233, -118.08343773439331
Elevation:	2968 ft
Timestamp:	2021-04-09T16:35:02.162Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

Map data ©2021 Imagery ©2021 , CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.646	MCE_R ground motion (period=0.2s)
S_1	1.302	MCE_R ground motion (period=1.0s)
S_{MS}	2.646	Site-modified spectral acceleration value
S_{M1}	1.953	Site-modified spectral acceleration value
S_{DS}	1.764	Numeric seismic design value at 0.2s SA
S_{D1}	1.302	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.924	Coefficient of risk (0.2s)
CR_1	0.904	Coefficient of risk (1.0s)

PGA	1.018	MCE$_G$ peak ground acceleration
F$_{PGA}$	1	Site amplification factor at PGA
PGA$_M$	1.018	Site modified peak ground acceleration
T$_L$	12	Long-period transition period (s)
SsRT	3.282	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.552	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.646	Factored deterministic acceleration value (0.2s)
S1RT	1.53	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.694	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.302	Factored deterministic acceleration value (1.0s)
PGAd	1.018	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Address:	34547
Coordinates:	34.5497, -118.132821
Elevation:	2923 ft
Timestamp:	2021-04-08T21:00:34.329Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	III
Site Class:	D

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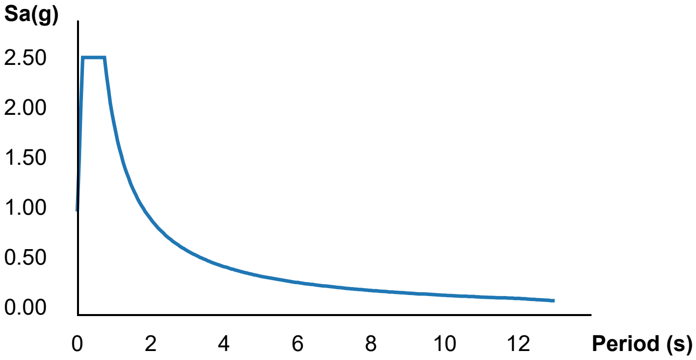
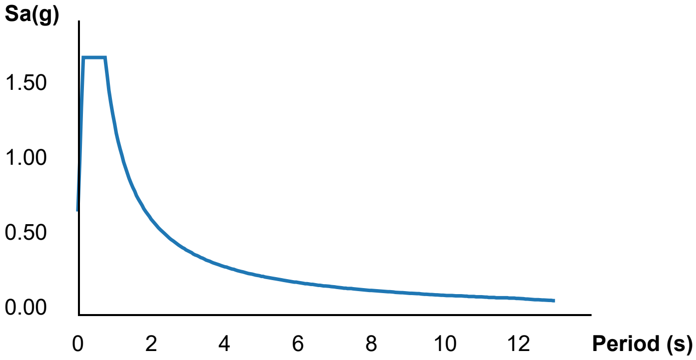
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.573	MCE_R ground motion (period=0.2s)
S_1	1.271	MCE_R ground motion (period=1.0s)
S_{MS}	2.573	Site-modified spectral acceleration value
S_{M1}	1.906	Site-modified spectral acceleration value
S_{DS}	1.715	Numeric seismic design value at 0.2s SA
S_{D1}	1.271	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.916	Coefficient of risk (0.2s)

CR_1	0.904	Coefficient of risk (1.0s)
PGA	0.987	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.987	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.429	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.743	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.573	Factored deterministic acceleration value (0.2s)
S1RT	1.614	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.785	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.271	Factored deterministic acceleration value (1.0s)
PGAd	0.987	Factored deterministic acceleration value (PGA)

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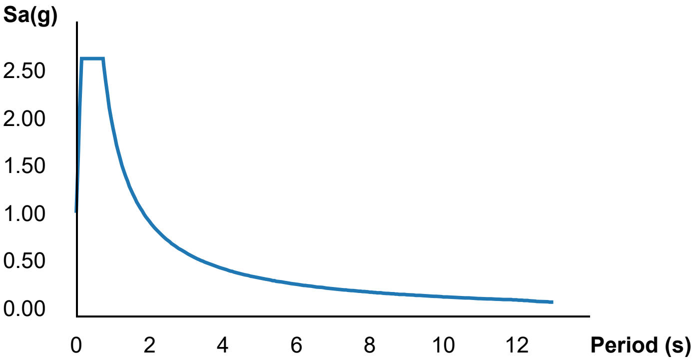
Hazards by Location

Search Information

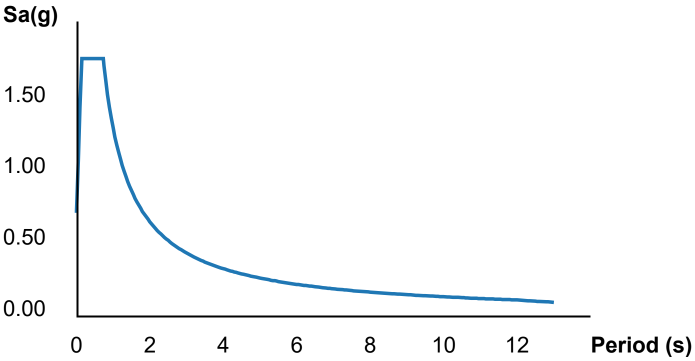
Coordinates:	34.559419345037064, -118.11618400870667
Elevation:	2750 ft
Timestamp:	2021-04-09T16:36:57.402Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

Map data ©2021 Imagery ©2021 , Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.706	MCE$_R$ ground motion (period=0.2s)
S_1	1.316	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.706	Site-modified spectral acceleration value
S_{M1}	1.975	Site-modified spectral acceleration value
S_{DS}	1.804	Numeric seismic design value at 0.2s SA
S_{D1}	1.316	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.92	Coefficient of risk (0.2s)
CR_1	0.903	Coefficient of risk (1.0s)

PGA	1.046	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.046	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.37	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.665	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.706	Factored deterministic acceleration value (0.2s)
S1RT	1.58	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.749	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.316	Factored deterministic acceleration value (1.0s)
PGAd	1.046	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Coordinates:	34.55371, -118.087856
Elevation:	2752 ft
Timestamp:	2021-04-09T16:19:01.173Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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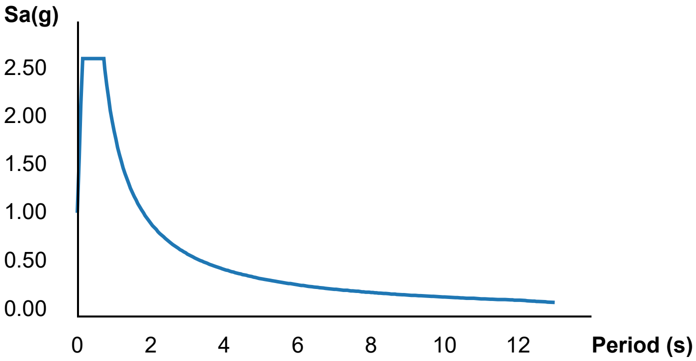
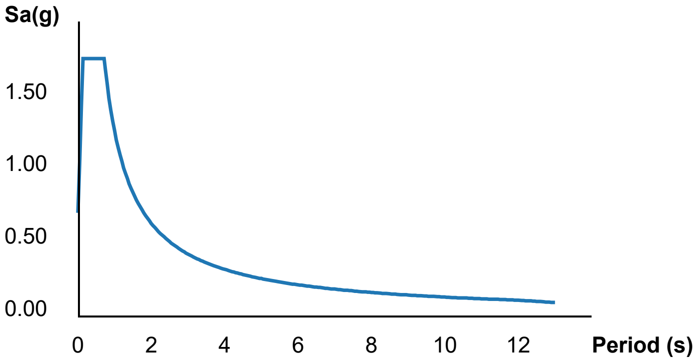
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.668	MCE_R ground motion (period=0.2s)
S_1	1.278	MCE_R ground motion (period=1.0s)
S_{MS}	2.668	Site-modified spectral acceleration value
S_{M1}	1.917	Site-modified spectral acceleration value
S_{DS}	1.779	Numeric seismic design value at 0.2s SA
S_{D1}	1.278	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.919	Coefficient of risk (0.2s)
CR_1	0.902	Coefficient of risk (1.0s)

PGA	1.031	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.031	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.432	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.737	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.668	Factored deterministic acceleration value (0.2s)
S1RT	1.613	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.788	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.278	Factored deterministic acceleration value (1.0s)
PGAd	1.031	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Coordinates:	34.55371, -118.087856
Elevation:	2752 ft
Timestamp:	2021-04-09T16:17:53.781Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	IV
Site Class:	D-default

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Basic Parameters

Name	Value	Description
S_S	2.404	MCE_R ground motion (period=0.2s)
S_1	1.025	MCE_R ground motion (period=1.0s)
S_{MS}	2.885	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.923	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

▾Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.874	Coefficient of risk (0.2s)
CR_1	0.869	Coefficient of risk (1.0s)
PGA	1.033	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	1.24	Site modified peak ground acceleration

T_L	12	Long-period transition period (s)
SsRT	3.008	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.441	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.404	Factored deterministic acceleration value (0.2s)
S1RT	1.294	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.489	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.025	Factored deterministic acceleration value (1.0s)
PGAd	1.033	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

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ATC Hazards by Location

Search Information

Coordinates:	34.544961034712664, -118.04877924893493
Elevation:	2740 ft
Timestamp:	2021-04-09T16:27:34.922Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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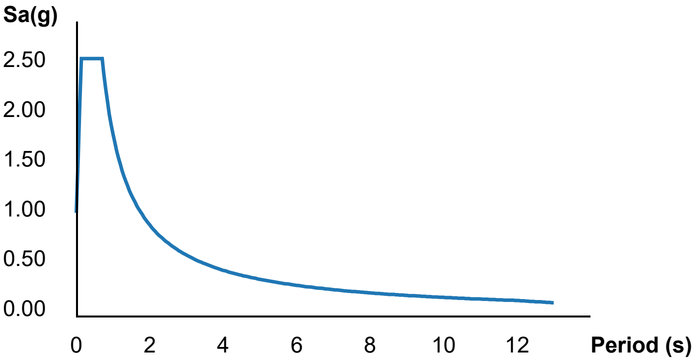
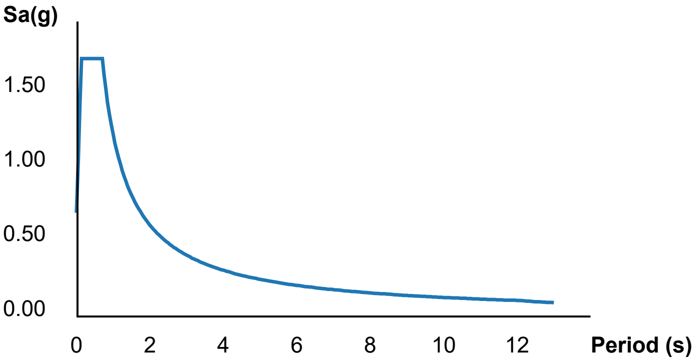
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.584	MCE_R ground motion (period=0.2s)
S_1	1.214	MCE_R ground motion (period=1.0s)
S_{MS}	2.584	Site-modified spectral acceleration value
S_{M1}	1.821	Site-modified spectral acceleration value
S_{DS}	1.723	Numeric seismic design value at 0.2s SA
S_{D1}	1.214	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.921	Coefficient of risk (0.2s)
CR_1	0.905	Coefficient of risk (1.0s)

PGA	0.996	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.996	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.159	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.432	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.584	Factored deterministic acceleration value (0.2s)
S1RT	1.47	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.624	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.214	Factored deterministic acceleration value (1.0s)
PGAd	0.996	Factored deterministic acceleration value (PGA)

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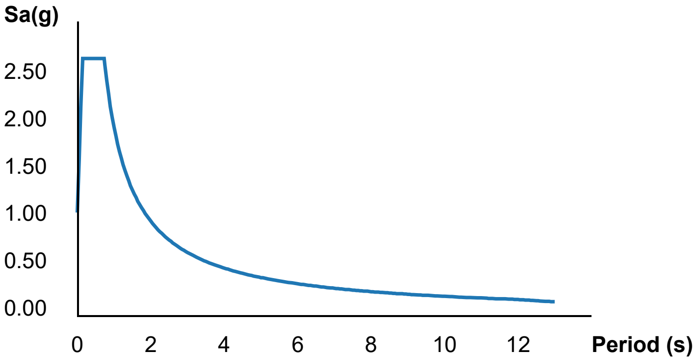
ATC Hazards by Location

Search Information

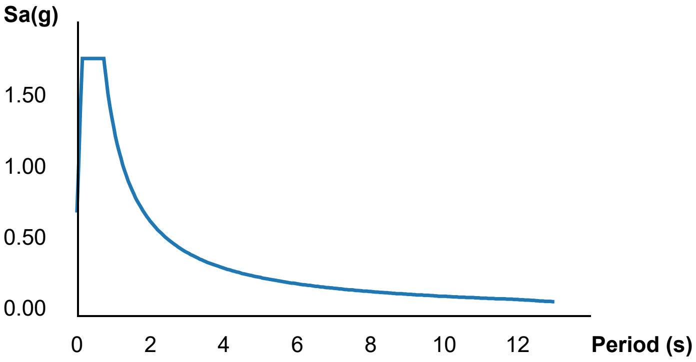
Coordinates:	34.52903336279662, -118.04584351481934
Elevation:	2971 ft
Timestamp:	2021-04-09T16:31:06.633Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

Map data ©2021 Imagery ©2021 , CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.714	MCE_R ground motion (period=0.2s)
S_1	1.325	MCE_R ground motion (period=1.0s)
S_{MS}	2.714	Site-modified spectral acceleration value
S_{M1}	1.987	Site-modified spectral acceleration value
S_{DS}	1.81	Numeric seismic design value at 0.2s SA
S_{D1}	1.325	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.923	Coefficient of risk (0.2s)
CR_1	0.905	Coefficient of risk (1.0s)

PGA	1.048	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.048	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.142	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.404	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.714	Factored deterministic acceleration value (0.2s)
S1RT	1.461	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.614	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.325	Factored deterministic acceleration value (1.0s)
PGAd	1.048	Factored deterministic acceleration value (PGA)

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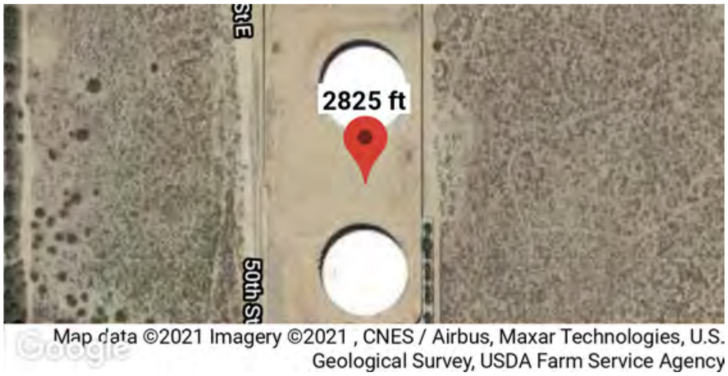
ATC Hazards by Location

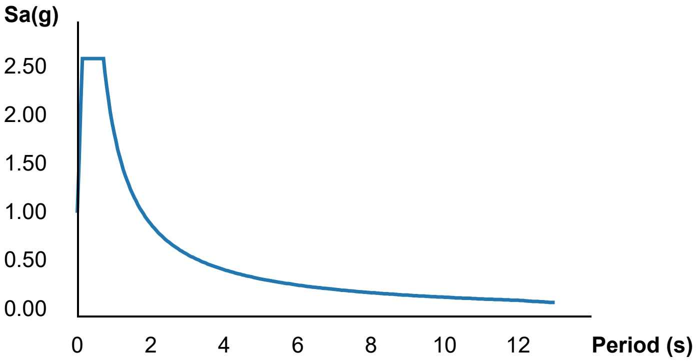
Search Information

Coordinates:	34.536316858195896, -118.04017088147585
Elevation:	2825 ft
Timestamp:	2021-04-09T16:33:04.897Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

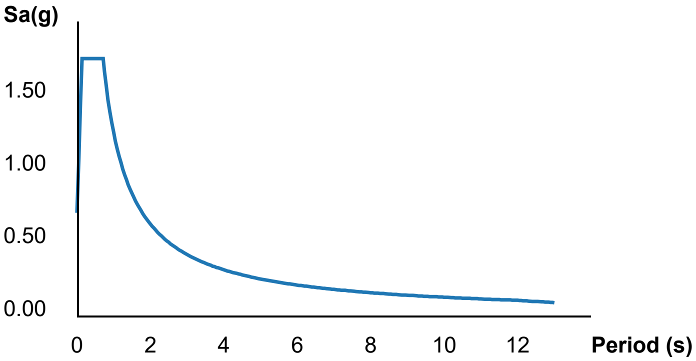


Map data ©2021 Imagery ©2021 , CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.652	MCE_R ground motion (period=0.2s)
S_1	1.26	MCE_R ground motion (period=1.0s)
S_{MS}	2.652	Site-modified spectral acceleration value
S_{M1}	1.889	Site-modified spectral acceleration value
S_{DS}	1.768	Numeric seismic design value at 0.2s SA
S_{D1}	1.26	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.923	Coefficient of risk (0.2s)
CR_1	0.905	Coefficient of risk (1.0s)

PGA	1.024	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.024	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.121	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.381	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.652	Factored deterministic acceleration value (0.2s)
S1RT	1.449	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.602	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.26	Factored deterministic acceleration value (1.0s)
PGAd	1.024	Factored deterministic acceleration value (PGA)

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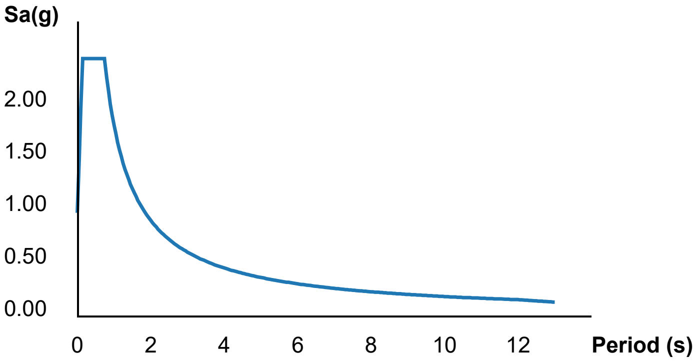
Hazards by Location

Search Information

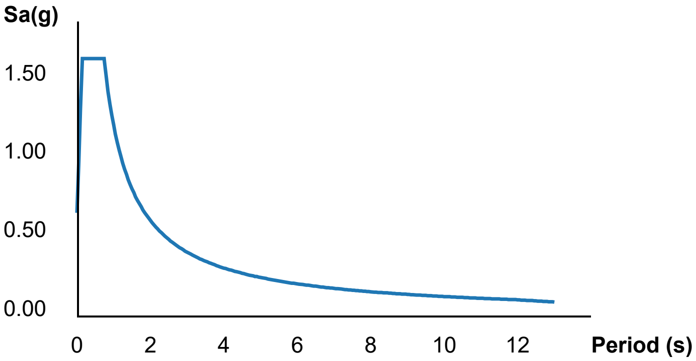
Coordinates:	34.54972773620536, -118.1502535834671
Elevation:	3116 ft
Timestamp:	2021-04-09T16:41:41.594Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

Map data ©2021 Imagery ©2021 , Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.458	MCE$_R$ ground motion (period=0.2s)
S_1	1.214	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.458	Site-modified spectral acceleration value
S_{M1}	1.82	Site-modified spectral acceleration value
S_{DS}	1.639	Numeric seismic design value at 0.2s SA
S_{D1}	1.214	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.916	Coefficient of risk (0.2s)
CR_1	0.906	Coefficient of risk (1.0s)

PGA	0.945	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.945	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.335	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.642	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.458	Factored deterministic acceleration value (0.2s)
S1RT	1.566	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.728	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.214	Factored deterministic acceleration value (1.0s)
PGAd	0.945	Factored deterministic acceleration value (PGA)

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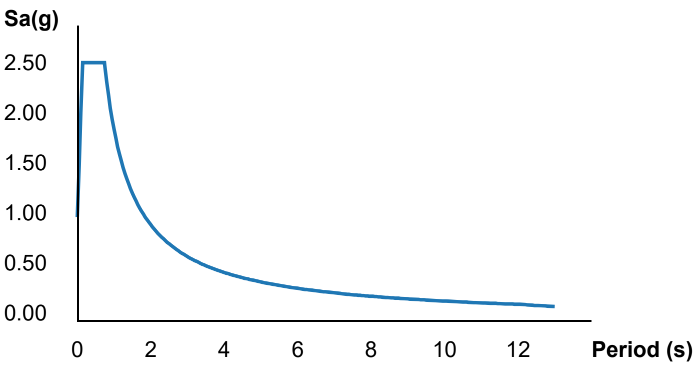
ATC Hazards by Location

Search Information

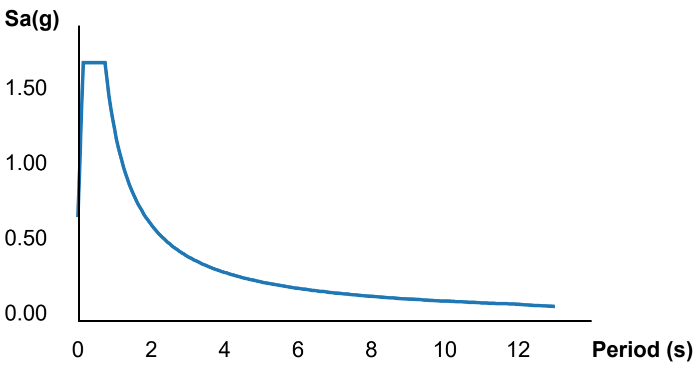
Address:	36809 El Camino Dr, Palmdale, CA 93551, USA
Coordinates:	34.54952240000001, -118.1326806
Elevation:	2925 ft
Timestamp:	2021-04-09T16:20:57.078Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

Map data ©2021 Imagery ©2021 , Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.571	MCE_R ground motion (period=0.2s)
S_1	1.27	MCE_R ground motion (period=1.0s)
S_{MS}	2.571	Site-modified spectral acceleration value
S_{M1}	1.905	Site-modified spectral acceleration value
S_{DS}	1.714	Numeric seismic design value at 0.2s SA
S_{D1}	1.27	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.916	Coefficient of risk (0.2s)

CR_1	0.904	Coefficient of risk (1.0s)
PGA	0.986	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.986	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.426	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.74	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.571	Factored deterministic acceleration value (0.2s)
S1RT	1.613	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.783	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.27	Factored deterministic acceleration value (1.0s)
PGAd	0.986	Factored deterministic acceleration value (PGA)

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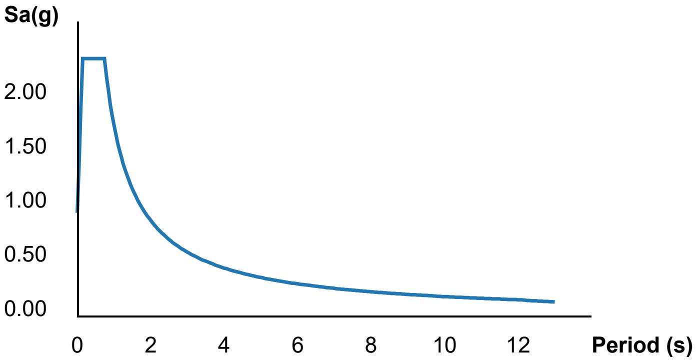
ATC Hazards by Location

Search Information

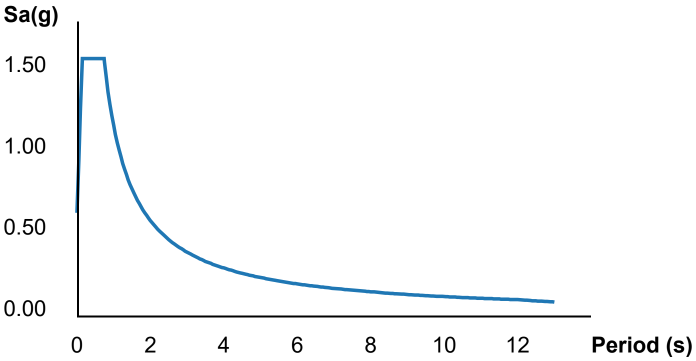
Map data ©2021 Imagery ©2021 , CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

Coordinates:	34.53840630847815, -118.13288506137695
Elevation:	3359 ft
Timestamp:	2021-04-09T20:04:43.993Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.375	MCE$_R$ ground motion (period=0.2s)
S_1	1.171	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.375	Site-modified spectral acceleration value
S_{M1}	1.756	Site-modified spectral acceleration value
S_{DS}	1.583	Numeric seismic design value at 0.2s SA
S_{D1}	1.171	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.925	Coefficient of risk (0.2s)
CR_1	0.908	Coefficient of risk (1.0s)

PGA	0.917	MCE$_G$ peak ground acceleration
F$_{PGA}$	1	Site amplification factor at PGA
PGA$_M$	0.917	Site modified peak ground acceleration
T$_L$	12	Long-period transition period (s)
SsRT	3.236	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.499	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.375	Factored deterministic acceleration value (0.2s)
S1RT	1.505	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.657	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.171	Factored deterministic acceleration value (1.0s)
PGAd	0.917	Factored deterministic acceleration value (PGA)

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ATC Hazards by Location

Search Information

Coordinates:	34.56128566737895, -118.12898168848265
Elevation:	2924 ft
Timestamp:	2021-04-09T20:40:24.218Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

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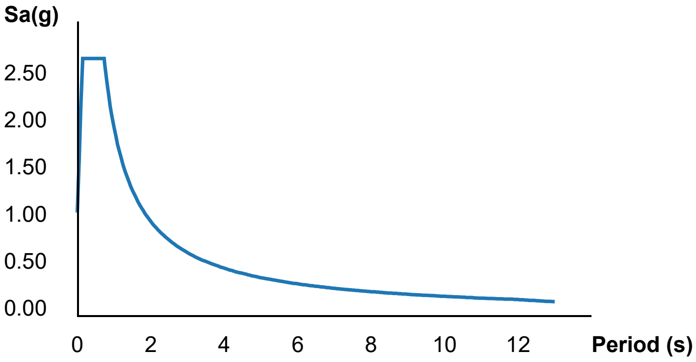
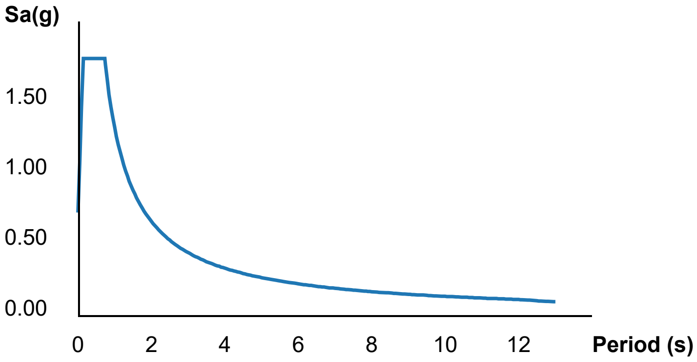
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.733	MCE$_R$ ground motion (period=0.2s)
S_1	1.331	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.733	Site-modified spectral acceleration value
S_{M1}	1.997	Site-modified spectral acceleration value
S_{DS}	1.822	Numeric seismic design value at 0.2s SA
S_{D1}	1.331	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.92	Coefficient of risk (0.2s)
CR_1	0.904	Coefficient of risk (1.0s)

PGA	1.055	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.055	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.306	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.594	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.733	Factored deterministic acceleration value (0.2s)
S1RT	1.547	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.71	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.331	Factored deterministic acceleration value (1.0s)
PGAd	1.055	Factored deterministic acceleration value (PGA)

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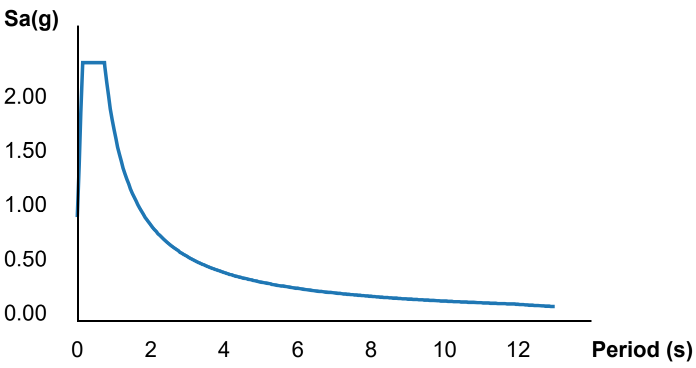
Hazards by Location

Search Information

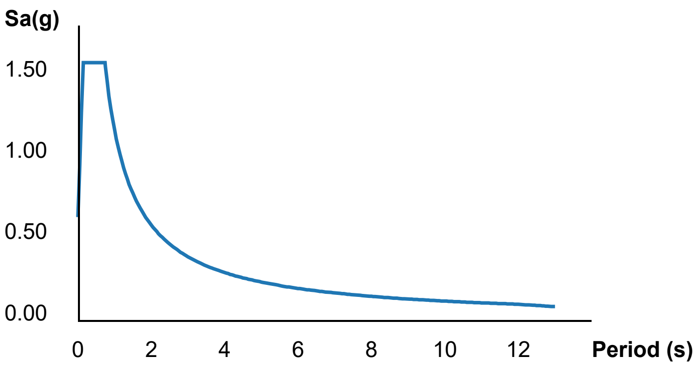
Address:	34547
Coordinates:	34.538438, -118.132863
Elevation:	3360 ft
Timestamp:	2021-04-08T22:06:10.243Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	III
Site Class:	D

Map data ©2021 Imagery ©2021 , Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.376	MCE$_R$ ground motion (period=0.2s)
S_1	1.171	MCE$_R$ ground motion (period=1.0s)
S_{MS}	2.376	Site-modified spectral acceleration value
S_{M1}	1.757	Site-modified spectral acceleration value
S_{DS}	1.584	Numeric seismic design value at 0.2s SA
S_{D1}	1.171	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.925	Coefficient of risk (0.2s)

CR_1	0.908	Coefficient of risk (1.0s)
PGA	0.917	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.917	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.236	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.5	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.376	Factored deterministic acceleration value (0.2s)
S1RT	1.505	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.657	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.171	Factored deterministic acceleration value (1.0s)
PGAd	0.917	Factored deterministic acceleration value (PGA)

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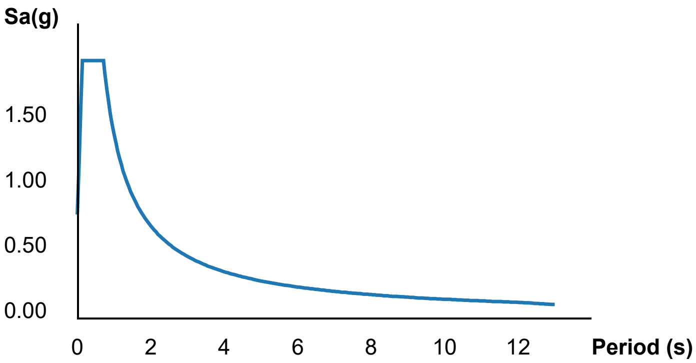
ATC Hazards by Location

Search Information

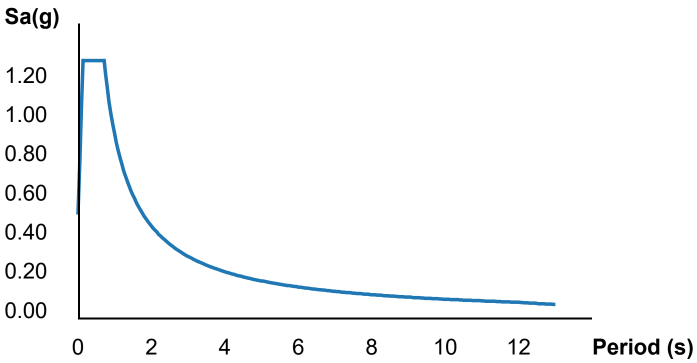
Coordinates:	34.598759799594845, -118.09844223112182
Elevation:	2583 ft
Timestamp:	2021-04-09T20:48:48.917Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	IV
Site Class:	D

Map data ©2021 Imagery ©2021 , CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	1.971	MCE$_R$ ground motion (period=0.2s)
S_1	0.937	MCE$_R$ ground motion (period=1.0s)
S_{MS}	1.971	Site-modified spectral acceleration value
S_{M1}	1.406	Site-modified spectral acceleration value
S_{DS}	1.314	Numeric seismic design value at 0.2s SA
S_{D1}	0.937	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	F	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.937	Coefficient of risk (0.2s)
CR_1	0.911	Coefficient of risk (1.0s)

PGA	0.77	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	0.77	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	2.602	Probabilistic risk-targeted ground motion (0.2s)
SsUH	2.776	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.971	Factored deterministic acceleration value (0.2s)
S1RT	1.168	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.282	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.937	Factored deterministic acceleration value (1.0s)
PGAd	0.77	Factored deterministic acceleration value (PGA)

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Hazards by Location

Search Information

Address: 1036 Barrel Spring Road palmdale, ca

Coordinates: 34.5457226, -118.1085956

Elevation: 2817 ft

Timestamp: 2021-05-04T20:11:47.998Z

Hazard Type: Seismic

Reference Document: ASCE7-10

Risk Category: III

Site Class: D

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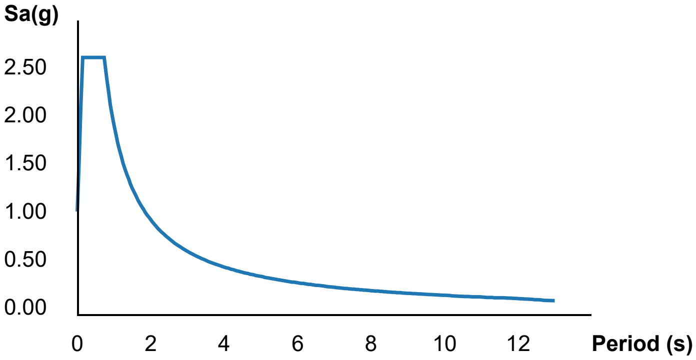
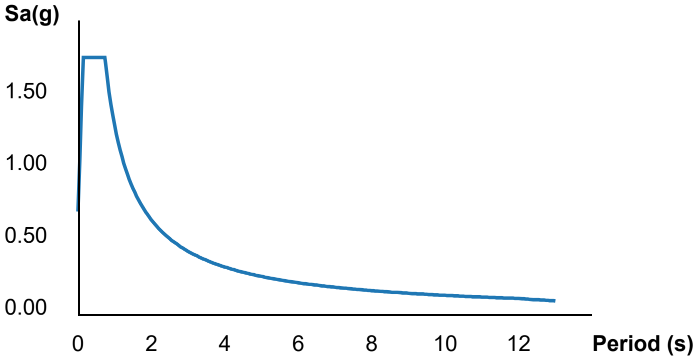
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.674	MCE_R ground motion (period=0.2s)
S_1	1.311	MCE_R ground motion (period=1.0s)
S_{MS}	2.674	Site-modified spectral acceleration value
S_{M1}	1.967	Site-modified spectral acceleration value
S_{DS}	1.782	Numeric seismic design value at 0.2s SA
S_{D1}	1.311	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.919	Coefficient of risk (0.2s)

CR_1	0.902	Coefficient of risk (1.0s)
PGA	1.029	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.029	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.49	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.799	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.674	Factored deterministic acceleration value (0.2s)
S1RT	1.643	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.821	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.311	Factored deterministic acceleration value (1.0s)
PGAd	1.029	Factored deterministic acceleration value (PGA)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

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ATC Hazards by Location

Search Information

Address:	15 4640 Barrel Spring Road palmdale, ca
Coordinates:	34.5268275, -118.0540864
Elevation:	3036 ft
Timestamp:	2021-05-04T20:14:23.952Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	III
Site Class:	D

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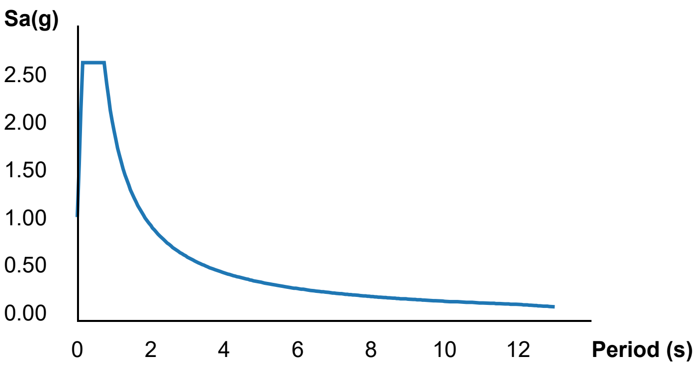
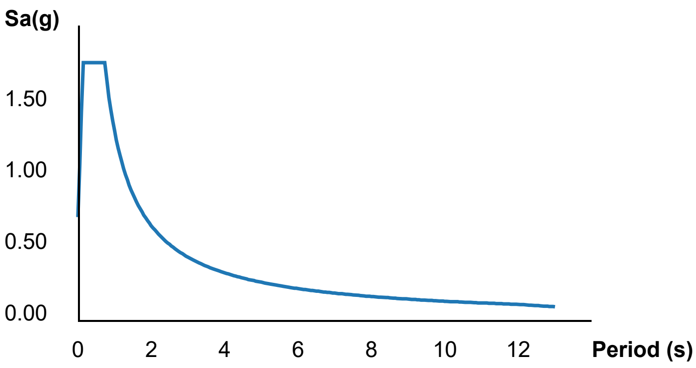
MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	2.7	MCE_R ground motion (period=0.2s)
S_1	1.323	MCE_R ground motion (period=1.0s)
S_{MS}	2.7	Site-modified spectral acceleration value
S_{M1}	1.984	Site-modified spectral acceleration value
S_{DS}	1.8	Numeric seismic design value at 0.2s SA
S_{D1}	1.323	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	E	Seismic design category
F_a	1	Site amplification factor at 0.2s
F_v	1.5	Site amplification factor at 1.0s
CR_S	0.924	Coefficient of risk (0.2s)

CR_1	0.905	Coefficient of risk (1.0s)
PGA	1.04	MCE_G peak ground acceleration
F_{PGA}	1	Site amplification factor at PGA
PGA_M	1.04	Site modified peak ground acceleration
T_L	12	Long-period transition period (s)
SsRT	3.149	Probabilistic risk-targeted ground motion (0.2s)
SsUH	3.409	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.7	Factored deterministic acceleration value (0.2s)
S1RT	1.464	Probabilistic risk-targeted ground motion (1.0s)
S1UH	1.617	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.323	Factored deterministic acceleration value (1.0s)
PGAd	1.04	Factored deterministic acceleration value (PGA)

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