Appendix 8-2
Updated Water Shortage Contingency Plan

CITY OF SIGNAL HILL

WATER SHORTAGE CONTINGENCY PLAN

December 2021

CITY OF SIGNAL HILL
2175 Cherry Avenue
Signal Hill, CA 90755

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ATTACHMENTS

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SECTION 1

WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT

1-1 Introduction

California Water Code (CWC) §10635 requires every urban water supplier to include as part of the Urban Water Management Plan (UWMP) an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry years. The supply and demand assessment is a comparison of the total water supply sources available to the long-term projected water use over the next 20 years, in five year increments for a normal, single dry water year, and a drought lasting five consecutive years.

In addition, new requirements for the 2020 UWMP include a Drought Risk Assessment (DRA). The DRA includes the following:

1. A description of the data, methodology, and basis for one or more supply shortage conditions
2. A determination of the reliability of each source of supply under a variety of water shortage conditions.
3. A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.
4. Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria

1-2 Water Service Reliability Assessment

1-2.1 Constraints on Water Sources

The City's water supplies include groundwater, imported water, and recycled water. The City receives the majority of its water supply from pumped water from within the Central Basin and the rest is supplemented by imported water. One City park irrigation system is served by recycled water and the City is currently working to expand this recycled water system.

1-2.1.1 Groundwater Supplies

Groundwater supplies come from Central Basin which was adjudicated in 1965 due to declining water levels. In the years following adjudication, groundwater levels rebounded and have been maintained by active recharge and annual limits to groundwater pumping by each party to the adjudication. The Central Basin Watermaster is tasked with ensuring compliance with the Judgment and preventing future overdraft conditions.

Groundwater elevation and quality in Central Basin has been monitored by the WRD for over 60 years. Monitoring data is compiled into annual reports, providing a comprehensive overview of the status of the basin. The most recently produced annual report is the *Regional Groundwater Monitoring Report, Water Year 2019-2020*.

In water year 2019-2020, the Central Basin water levels varied across the basin. In the northern portion of the basin, the area between the Los Angeles and Montebello Forebays, water levels have decreased by as much as about three feet from the prior year. Along the eastern border of the basin, water levels range from nearly three feet lower in the north to more than eight feet higher in the south than they were in fall 2019. Across the southern and western portions of the basin, water levels range from nearly five feet higher in the south to relatively unchanged in the west compared to the prior year.

In addition to monitoring, the Water Replenishment District of Southern California (WRD) replenishes the Central Basin with a combination of local storm water and recycled water. The completion of the Albert Robles Center for Water Recycling and Environmental Learning (ARC) in 2019 enabled WRD to be completely locally sustainable, eliminating imported water as a source of replenishment. The City does not anticipate that legal or quantity issues will constrain the groundwater supply in the future.

WRD reports the groundwater quality in Central Basin is generally of "good quality and is suitable for use by the pumpers in the District, the stakeholders, and the public. Groundwater from localized areas with marginal to poor water quality can still be utilized but may require treatment prior to being used as a potable source". Eleven chemical compounds were used to summarize the overall water quality as follows: Total Dissolved Solids (TDS), Iron, Manganese, Chloride, Nitrate, TCE, PCE, Arsenic, Perchlorate, Hexavalent Chromium, and 1,4-Dioxane.

Beginning in water year 2018-2019 and ending in water year 2019-2020, WRD completed a District-wide assessment for the presence of PFAS constituents in WRD nested monitoring wells and production wells. PFOS and PFOA detections in Central Basin are generally restricted to the vicinity of the Montebello Forebay. They occur within the Montebello Forebay, immediately adjacent and to its west, as well as downgradient along the Los Angeles and San Gabriel Rivers. Fortunately for the City, PFOS and PFOA has resulted in non-detect at Well 9, which is currently the only well required to be tested.

Sea water intrusion in the Alamitos Gap near the mouth of the San Gabriel River poses a threat to the groundwater in the basin. The Alamitos Gap Barrier Project, operated by the Los Angeles County Department of Public Works (LADPW), is made up of 43 injection wells that are designed to prevent sea water intrusion into the basin by creating a groundwater pressure ridge. The project also includes 220 observation wells used to monitor groundwater levels and quality.

1-2.1.2 Imported Water Supplies

Imported water is provided by the Metropolitan Water District of Southern California (MWD). MWD is a wholesale water provider serving most of Southern California, therefore, its water reliability is essential to the region. MWD water supplies are imported from Northern California through the State Water Project's California Aqueduct and from the Colorado River through the Colorado River Aqueduct.

Water imported by MWD comes from two main sources, the State Water Project (SWP) and the Colorado River Aqueduct (CRA). As par to of MWD's 2015 Integrated Resources Plan (IRP) Update, MWD evaluated the reliability of these two water supply sources. Through the process, MWD identified the following risks affecting the reliability of supplies:

- Drought conditions

- Endangered species protection and conveyance needs in the Sacramento-San Joaquin River Delta (Bay-Delta) system
- Changing climate patterns
- Difficulty and implications of environmental review, documentation, and permitting for water supply projects
- Public perception of recycled water use
- Opposition to local seawater desalination

In the IRP, MWD lays out planned actions to address these risks. MWD is committed to supply reliability and states that "through the implementation of the IRP, MWD and its member agencies will have the full capability to meet full-service demands at the retail level at all times." Based on this analysis and the fact that City does not anticipate utilizing imported supplies except in an emergency situation, the City does not anticipate that imported water will constrain supply reliability in the future.

Quality of imported water supplies is not expected to impact supply reliability for the City. Imported water comes from the Bay-Delta system through the SWP and from the Colorado River through the CRA. Water imported through the SWP is generally of high water quality, with total dissolved solids (TDS) concentrations averaging 325 mg/L. Potential water quality concerns for SWP water include total organic carbon (TOC), bromide, and salinity. TOCs and bromides present the greatest water quality concern for the SWP because they cause operational constraints and require additional treatment at MWD facilities. The most significant concern for supplies from the Colorado River is salinity. Water imported through the CRA has much higher salinity than from the SWP, averaging 630 mg/L. SWP water is typically blended with CRA water to reduce the overall salinity of imported water delivered through MWD and its member agencies.

1-2.1.3 Recycled Water Supplies

The City receives recycled water from the City of Long Beach for one customer, Reservoir Park. The City may increase recycled water use in the future by extending the system to additional parks. Recycled water exhibits less variability than other supply sources and it is dependent on wastewater generation and not precipitation or other climatological factors. As recycled water is not limited by hydrologic variation, it is considered a nearly 100 percent reliable, drought resistant supply. Typical water quality concerns with recycled water include salinity, nutrients, and pharmaceuticals and personal care products. Water quality issues with recycled water are less significant than other sources that are used for potable purposes. All recycled water distributed in the City's service area is treated to tertiary standards and is not expected to impact utilization of this water supply for non-potable uses in the future.

1-2.2 Year Type Characterization

One of the most significant constraints on water supply for Southern California water agencies are droughts. The City's service area experienced drought conditions from 2012 to 2016, which affected other agencies within the Central Groundwater Basin as well. It was not until rainfall year 2016-2017 that Southern California experienced more "normal" rainfall levels.

Most agencies within the Central Groundwater Basin have at least two sources of water, Central Basin groundwater and MWD imported water. During drought conditions, MWD faces a number of challenges in providing imported water to its customers and therefore reduced imported water supplies lead to increased groundwater usage. Although the supply of groundwater has historically been adequate to meet the demands of customers, the City remains vulnerable to water shortages due to the heavy reliance on groundwater and the limited rainfall typical of Southern California.

For the 2020 UWMP, the City has selected its normal, single dry and multiple dry years based on historical precipitation information maintained by the Los Angeles County Department of Public Works shown in Table 1-1. The rainfall data at the Signal Hill City Hall Station 415 did not extend past 2001-2002. Therefore, the average rainfall amount at Long Beach Airport Station 662D and Long Beach Reclamation Plant Station 1254 was utilized in its place.

Table 1-1
Rainfall Data

Water Year (Oct. 1- Sept. 30)	Signal Hill City Hall, Sta. 415 (in)	Long Beach Airport Sta. 662D (in)	Long Beach Reclamation Plant Sta. 1254 (in)	Precipitation (in)	% of Average Precipitation	Water Year Type
1996-1997	13.60	14.13	14.00	13.60	117	Used Station 415
1997-1998	29.01	29.21	25.59	29.01	250	Used Station 415
1998-1999	8.22	8.54	8.91	8.22	71	Used Station 415
1999-2000	-	6.53	7.88	7.21	62	Used Station 415
2000-2001	13.15	10.90	15.67	13.15	113	Used Station 415
2001-2002	3.44	2.21	4.08	3.44	30	Used Station 415
2002-2003	-	-	15.33	15.33	132	Used Station 1254
2003-2004	-	-	6.69	6.69	58	Used Station 1254
2004-2005	-	-	28.00	28.00	241	Used Station 1254
2005-2006	-	-	9.28	9.28	80	Used Station 1254
2006-2007	-	2.58	4.11	3.35	29	Single Dry Year
2007-2008	-	10.90	10.21	10.56	91	Normal Dry Year
2008-2009	-	9.44	9.54	9.49	82	
2009-2010	-	15.66	15.22	15.44	133	
2010-2011	-	18.80	18.50	18.65	161	
2011-2012	-	7.59	7.70	7.65	66	Multiple Dry Year
2012-2013	-	6.69	6.59	6.64	57	Multiple Dry Year
2013-2014	-	4.62	-	4.62	40	Multiple Dry Year
2014-2015	-	9.35	9.53	9.44	81	Multiple Dry Year
2015-2016	-	4.99	6.31	5.65	49	Multiple Dry Year
2016-2017	-	20.10	20.14	20.12	173	
2017-2018	-	3.53	3.48	3.51	30	
2018-2019	-	17.63	17.83	17.73	153	
Minimum	**3.44**	**2.21**	**3.48**	**3.35**		
Average	**13.48**	**10.71**	**12.03**	**11.60**		

** Rainfall data from Los Angeles County Dpartment of Public Works (http://www.ladpw.org/wrd/precip/)*

From water year 1996-1997 to 2018-2019, the average precipitation was about 11.60 inches. The City has experienced numerous and significant annual precipitation changes. Precipitation in water year 2007-2008 was the closest to the average and was therefore designated the normal dry year. The single dry year occurred in water year 2006-2007 when the precipitation was 3.35 inches or 29 percent of normal. Water years 2011-2012 through 2015-2016 had less than normal precipitation rates. Therefore, they were designated as the multiple dry years. The basis of water year data is shown in Table 1-2.

Table 1-2
Basis of Water Year Data

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	2008	**2,129**	100%
Single-Dry Year	2007	**2,338**	110%
Consecutive Dry Years 1st Year	2012	**2,178**	102%
Consecutive Dry Years 2nd Year	2013	**2,228**	105%
Consecutive Dry Years 3rd Year	2014	**2,110**	99%
Consecutive Dry Years 4th Year	**2015**	**1,845**	87%
Consecutive Dry Years 5th Year	**2016**	**1,789**	84%
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES:			

1-2.3 Water Service Reliability

The "average" year is interchangeable with "normal" year. The comparison of supply and demand in normal water years is shown in Table 1-3 based on population projections. The comparison is provided for potable water only since the City only provides potable water service to its customers. In a normal water year, the City anticipates having enough supply to meet projected demands for years 2025 through 2040, with an average surplus of 2,333 AF per year.

Table 1-3
Normal Year Supply and Demand Comparison

Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison				
	2025	2030	2035	2040
Supply totals	4,322	4,322	4,322	4,322
Demand totals	1,947	1,974	2,001	2,034
Difference	2,375	2,348	2,321	2,288
NOTES: Recycled water use is not included in the supply or demands.				

In all future singe dry year scenarios, the City anticipates having the same volume of water available to it as is available under normal year conditions. Groundwater replenishment varies with hydrology and access to recharge supplies, but the ability to extract groundwater is more a function of long-term average recharge and is less subject to hydrologic variability from year to year. Additionally, WRD's ARC facility and other replenishment efforts to increase recharge in wet years to allow more storage and extraction in dry years will further increase the reliability of the City's water supply in dry years. As evidence, in 2007, the year selected to represent single dry year hydrology, groundwater yield was unaffected by the drought and the City had access to enough water supply to satisfy all demands. In a single dry year, the City anticipates having enough supply to meet projected demands for years 2025 through 2040, with an average surplus of 1,913 AF per year.

Table 1-4
Single Dry Year Supply and Demand Comparison

Submittal Table 7-3 Retail: Single Dry Year Supply and Demand Comparison				
	2025	2030	2035	2040
Supply totals*	4,322	4,322	4,322	4,322
Demand totals*	2,367	2,394	2,421	2,454
Difference	1,955	1,928	1,901	1,868
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*				
NOTES: Demand in 2007 = 2,338 AF. This demand was increased by the amount of water demand expected from an increase in population for each of the future years.				

Under the multiple dry year scenario (5-consecutive year drought conditions), based on hydrologic conditions similar to the 2012-2016 period, the City also anticipates having enough water supplies to meet the majority of projected demands as shown in Table 1-5.

- The first dry year was assumed to be similar to 2012 with an adjustment for future demands due to a population increase. The 2012 demand was 2,178 AF.
- The second dry year demand was assumed to be similar to 2013 with an adjustment for future demands due to a population increase. The 2013 demand was 2,228 AF. The increase in demand is about 2.3 percent from the previous year.
- The third dry year demand was assumed to be similar to 2014 with an adjustment for future demands due to a population increase. The 2014 demand was 2,110 AF. The decrease in demand is about 5.3 percent from the previous year.

- Due to the establishment of a Level 1 Water Shortage Condition and the implementation of drought messaging in 2014, the City's actual demands decreased to 1,845 AF or by about 12.6 percent in from the previous year. Since the City now has permanent water conservation requirements and best management practices in place, the water demands are not expected to decrease as significantly when a Level 1 Water Shortage Condition is implemented again. Therefore, the fourth dry year demand was assumed to drop by 5.0 percent from the prior year with an adjustment for future demands due to a population increase.
- In the fifth dry year, demands were assumed to decrease by 5.0 percent from the prior year with an adjustment for future demands due to population increase.

Table 1-5
Multiple Dry Years Supply and Demand Comparison

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison					
		2025*	2030*	2035*	2040*
First year	Supply totals	4,322	4,322	4,322	4,322
	Demand totals	2,207	2,234	2,261	2,294
	Difference	2,115	2,088	2,061	2,028
Second year	Supply totals	4,322	4,322	4,322	4,322
	Demand totals	2,257	2,284	2,311	2,344
	Difference	2,065	2,038	2,011	1,978
Third year	Supply totals	4,322	4,322	4,322	4,322
	Demand totals	2,139	2,166	2,193	2,226
	Difference	2,183	2,156	2,129	2,096
Fourth year	Supply totals	4,322	4,322	4,322	4,322
	Demand totals	2,034	2,061	2,088	2,121
	Difference	2,288	2,261	2,234	2,201
Fifth year	Supply totals	4,322	4,322	4,322	4,322
	Demand totals	1,934	1,961	1,988	2,021
	Difference	2,388	2,361	2,334	2,301
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*					
NOTES: The 1st through 3rd years are based on the demand in 2012 through 2014. The 4th and 5th dry year demands were assumed to drop by 5% from the previous year. The demands were increased by the amount of water demand expected from an increase in population for each of the future years.					

1-3 Drought Risk Assessment

A new requirement of the 2020 UWMP is the drought risk assessment [CWC §10635(b)]. The DRA evaluation is required so that a water supplier can contemplate management of their water supplies during stressed hydrologic conditions in relation to variations in customer water use. Most importantly, it provides the water supplier an opportunity to evaluate the functionality of its Water Shortage Contingency Plan (WSCP) shortage response actions and understand the degree of response that may be necessary as it relates to managing water supplies. The evaluation can help identify undesired risks and allow proactive steps to be taken prior to the next actual drought period lasting at least five consecutive years.

The drought risk assessment (DRA) must include a description of the following:

1. Data and methods used

2. Basis for the supply shortage conditions
3. Determination of the reliability of each source
4. Comparison of total water supplies and uses during the drought
5. Consideration of historical drought hydrology, climate change conditions, regulatory changes and other locally applicable criteria

1-3.1 Data and Methods

The demands are based on production records. In 2020, the City provided 1,918 AF of water to its customers. Using the 2020 population of 11,712, the water use per person is calculated to be 146 gpcd. Projected demands are based on 146 gpcd and the projected population of the future year. The potable water demand projected for 2025 is 1,947 AF as shown in Table 1-3. The water use increase was assumed to increase at a linear rate from 2021 to 2025.

The City's total groundwater rights is 2,022 AF. For the Drought Risk Assessment, the City conservatively considered if only the amount of groundwater rights was available and there was no carryover included in the City's total available groundwater supply.

1-3.2 Water Source Reliability

The City's groundwater right of 2,022 AFY in the Central Basin Aquifer

The City has minimized its use of imported water by maintaining its well capacity. Well No. 8 was deteriorating due to age and recently destroyed. Well No. 10 is a new well that has been drilled and slated for completion in early 2022. The City plans to get as much production form the wells as possible to meet all demands. Imported water is only a supplemental supply during high demand periods or in the case that a well is shut down for maintenance purposes or any other issues that may arise. Once Well No. 10 is completed and online, the City supply is expected to be 100 percent groundwater.

1-3.3 Water Supply and Use Comparison

The five-year DRA analysis is shown in Table 1-6.

Table 1-6
Five-Year Drought Risk Assessment

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2021	**Total**
Total Water Use	1,931
Total Supplies	2,022
Surplus/Shortfall w/o WSCP Action	91
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	91
Resulting % Use Reduction from WSCP action	0%

Table 1-6 (continued)
Five-Year Drought Risk Assessment

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2022	**Total**
Total Water Use	1,945
Total Supplies	2,022
Surplus/Shortfall w/o WSCP Action	77
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	77
Resulting % Use Reduction from WSCP action	0%
2023	**Total**
Total Water Use	1,958
Total Supplies	2,022
Surplus/Shortfall w/o WSCP Action	64
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	64
Resulting % Use Reduction from WSCP action	0%
2024	**Total**
Total Water Use	1,971
Total Supplies	2,022
Surplus/Shortfall w/o WSCP Action	51
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	51
Resulting % Use Reduction from WSCP action	0%

Table 1-6 (continued)
Five-Year Drought Risk Assessment

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2025	**Total**
Total Water Use	1,984
Total Supplies	2,022
Surplus/Shortfall w/o WSCP Action	38
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	38
Resulting % Use Reduction from WSCP action	0%

1-4 Climate Change

The 2013 Integrated Regional Water Management (IRWM) Plan states that precipitation in the Greater Los Angeles County (GLAC) Region is expected to decrease by 2 to 5 inches throughout the South Coast of California with the most extreme reductions taking place in the higher elevations. This could result in a decrease in local groundwater supplies. Fortunately, WRD took the initiative and completed the construction of the ARC so that 21,000 AFY of advanced treated water can be used to replenish the Central Basin. This has ended WRD's reliance on imported water for groundwater replenishment as well as significantly reducing the need for local runoff for replenishment. In 2019-2020, the amount of water contributing to the replenishment of the Central Basin was 35,447 AF, down from 81,531 AF in the previous year. A significant reduction in supply due to climate change is not expected over the 25-year planning horizon.

Climate change may not significantly reduce supply in Central Basin, but demands in the GLAC Region are predicted to increase due to increased temperatures, especially because potable water is still used for irrigation purposes. This in turn could place a larger demand on the groundwater supplies that are available. In order to account for this possibility, the City excluded carry over from year to year in the total supplies for the Drought Risk Assessment. Only the City's total groundwater rights of 2,022 AF was considered as supply.

SECTION 2
ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

2-1 General

Beginning July 1, 2022, water suppliers will be required to prepare an annual water supply and demand assessment and submit an Annual Water Shortage Assessment Report (AWSAR) to the California Department of Water Resources (DWR). The AWSAR will be due July 1st each year as required by Water Code Section 10632.1. The annual assessment and associated reporting to be conducted are detailed in this section of the WSCP.

2-2 Water Code

Water Code Section 10632 (a)(2)

The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.

(i) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(ii) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of supply.

Water Code Section 10632.1

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

2-3 Decision-Making Process

The following is the City's written decision making process, describing the functional steps for determining water supply reliability every year.

The Water Utility Superintendent shall be responsible for ensuring that the annual water supply and demand assessment is completed and the AWSAR is submitted to DWR each year by July 1st.

The City Council is responsible for declaring a water shortage through the adoption of a resolution.

The general timeline for completing and approving the AWSAR is as follows:

1. January – Gather data needed to assess supply and demands for upcoming year. Analyze data and prepare preliminary results of supply and demand assessment
2. February/March – Submit and present preliminary supply and demand report to the City Council
3. April/May – Finalize assessment and present final AWSAR to the City Council with a request to vote on the findings and appropriately trigger any recommendations for specific shortage response actions resulting from the assessment.
4. June – Activate Shortage Response Actions, seek supplemental supplies (leases), finalize the AWSAR
5. July 1st – Submit finalized AWSAR to DWR

2-4 Key Data Inputs and Methodology

2-4.1 General Evaluation Criteria

The City's supply and demand assessment will basically calculate the available supply for the upcoming year and the estimated demands for the upcoming year.

The City will maintain a spreadsheet that tracks monthly production for a minimum of five years prior to the assessment year. Annual production, supply, billing data and rainfall will also be tracked in a spreadsheet.

A preliminary assessment will be conducted at the beginning of each year. This assessment will be updated and refined as data becomes available to complete the information input for the previous fiscal year.

2-4.2 Upcoming Year Available Water Supply

The City's water supply is primarily groundwater from the Central Groundwater Basin. The total amount of groundwater produced from all wells and the amount of imported water utilized is tracked monthly by the City. This information will be utilized in determining the historical production and purchase as well as predicting the upcoming year (i.e. upcoming fiscal year) supply needs.

The upcoming year available water supply will be based on the City's Annual Pumping Allocation (APA), normal carryover, storage balance, and water leases in the Central Groundwater Basin. The Company currently has an APA of 2,022 AF.

The Central Basin Watermaster publishes an annual report summarizing information on groundwater extractions, storage accounts, use of imported water and recycled water, replenishment operations, and the

budget and finances of the Central Basin Watermaster for each administrative year (July 1 to June 30). This annual report provides the Company's total rights for the fiscal year, which includes the APA, net carryover from the previous year, and leases.

In 2020-2021, the City's total water right was 3,942.9 AF, made up of the following components:

1. APA = 2,022 AF
2. Total Carryover from 2019-2020 = 1920.9 AF

In order for the City to calculate the supply for the upcoming fiscal year, an assumption has to be made for the net carryover. This can be done by estimating the total water extractions for the upcoming fiscal year and subtracting it from the total rights. If the water supply and demand assessment is conducted in January each year, the demands for January through June will need to be estimated. This will be done by using historical monthly ratios of water use as shown in Table 2-1.

Table 2-1
Historical Monthly Water Use Ratios

	Total Production and Purchase					Historical Monthly Average	Historical Average Monthly	Total Production 2020-2021
Month	2015-2016 AF	2016-2017 AF	2017-2018 AF	2018-2019 AF	2019-2020 AF	AF	Ratio	AF
July	158.9	173.0	170.4	184.1	187.2	175	0.0954	185
August	164.5	178.2	181.2	188.0	189.9	180	0.0985	189
September	162.0	168.4	148.7	166.6	182.9	166	0.0905	181
October	158.4	158.4	182.6	164.8	156.0	164	0.0896	173
November	144.6	136.5	175.4	150.3	183.7	158	0.0864	160
December	137.7	124.8	134.9	126.4	128.7	131	0.0713	150
January	122.0	113.5	142.7	128.4	137.3	129	0.0703	137 *
February	135.3	100.4	132.4	106.2	137.9	122	0.0669	131 *
March	134.7	134.6	134.0	137.0	132.0	134	0.0734	143 *
April	140.5	155.9	128.2	158.0	132.8	143	0.0781	152 *
May	155.4	164.2	162.2	171.6	161.1	163	0.0890	174 *
June	162.2	153.5	161.3	172.0	179.7	166	0.0905	177 *
Total	**1,776**	**1,761**	**1,854**	**1,853**	**1,909**	**1,831**	**1.0000**	**1,952**
Rainfall (in)	**5.65**	**20.12**	**3.51**	**17.73**				

**Estimated based on historical average monthly ratio*

Total for July - Dec 2020 **1,038**
Estimated Total for 2020-2021 **1,952**

The known system demands for July 2020 through December 2020 are shown in Table 2-1. The total demand for these nine months was 1,038 AF. It is assumed that this is 53.17 percent of the total fiscal year (sum of historical average monthly ratio from July through December). The total system demand for FY 2020-2021 is therefore calculated to be 1,952 AF (1,038/0.5317). The system demands for January 2021 through June 2021 are estimated using the "Historical Average Monthly Ratio" times the total estimated system demand for FY 2020-2021 or 1,952 AF. This is the system demand that will be used to determine the carryover for 2020-2021.

Carryover for 2020-2021 = (Water Rights for 2020-2021) – (Estimated Total Production for 2020-2021)

= 3,942.9 AF – 1,952 AF

= 1,990.9 AF

Once the carryover for the upcoming year is known, the projected supply (i.e. water rights) can be calculated as follows:

Water Rights for 2021-2022 = APA + Carryover from 2020-2021

= 2,022 AF + 1,990.9 AF

= 4,012.9 AF

Each year, the aforementioned calculations will be made to estimate the City's water rights or water supply for the upcoming fiscal year.

2-4.3 Upcoming Year Unconstrained Customer Demand

Per Southern California Association of Governments (SCAG) data. The estimated population increase within the City's service area is very minimal. The population is expected to increase by 700 persons over the next 25 years.

The City already implements permanent water conservation measures, therefore significant changes in water use are not expected due to additional policies and/or regulations.

Customer demand for the upcoming year is primarily dependent on weather conditions since there is limited recycled water utilized within the service area. Potable water is used for irrigation purposes as well as indoor use. The City considers weather forecasts and drought conditions, utilizing resources such as the National Oceanic and Atmospheric Administration (NOAA) and Western Regional Climate Center (WRCC), in estimating the customer demand for the upcoming year.

In lieu of reliable weather forecasts, it will be assumed that the upcoming year could be a dry year and the demands from a recent dry year (such as 2017-2018 shown in Table 2-1) or the current estimated demands, whichever is more conservative, will be considered for the demand of the upcoming year.

Based on the data shown in Table 2-1, the demands for 2021-2022 will be conservatively estimated at 1,952 AF which is the estimated production for 2020-2021. This is higher than the production seen in the last dry year in 2017-2018 when the total production was 1,854 AF.

2-4.4 Infrastructure Considerations

The City will evaluate the following to determine if there will be any constraints on the system related to infrastructure that will affect its ability to deliver supplies to meet the expected demands in the upcoming year:

1. Capital Improvement Projects

2. Planned Upgrades or Repairs

SECTION 3
SIX STANDARD WATER SHORTAGE STAGES

3-1 Water Code

Water Code Section 10632(1)(3)

(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.

3-2 Standard Water Shortage Levels

Water Code Section 10632(1)(3) requires water suppliers to include six standard water shortage levels that represent shortages from the normal reliability. The shortage levels have been standardized to provide a consistent regional and statewide approach to conveying the relative severity of water supply shortage conditions. The six standard water shortage levels must correspond to progressively increasing estimated shortage conditions (up to 10-, 20-, 30-, 40-, 50- percent, and greater than 50 percent shortage compared to normal reliability condition) and align with response actions the supplier would implement to meet the severity of the impending shortages.

3-3 Water Shortage Stages

Water Code Section 10632(1)(3)(B) authorizes suppliers to continue using their own water shortage levels that have been provided in past Water Shortage Contingency Plans as long as the relationship to the six standard water shortage levels is provided.

The City of Signal Hill (City) currently has a Water Shortage Contingency Plan (WSCP) in place with the three stages shown (Current WSCP) in Table 3-1. The corresponding shortage level mandated by the Water Code is also shown in Table 3-1 (Shortage Level).

Table 3-1
Water Shortage Stage Crosswalk

Current WSCP Stage	Supply Condition / Shortage	2020 UWMP Stage	Shortage Level
Level 1	Minor Condition	1	Up to 10%
Level 2	Moderate Condition	2	10-20%
Level 3	Severe and Emergency Condition	3	20-30%
		4	30-40%
		5	40-50%
		6	Greater than 50%

SECTION 4
SHORTAGE RESPONSE ACTIONS

4-1 Water Code

Water Code Section 1-632(a)(4)

Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

4-2 Supply Augmentation

The City's water supply sources include groundwater, imported water, and recycled water. Groundwater is pumped from the Central Groundwater Basin which is adjudicated. The City has an Allowed Pumping Allocation (APA) of 2,022 acre feet per year (AFY). The City's goal is to maximize the use of local sources in order to provide a reliable supply for the existing and planned development within its service area.

The City's demand is typically less than the APA and imported water is a backup supply to the City wells and is typically utilized to meet the peak demands during the warm summer months. If needed, the City also has the option to obtain leases for additional groundwater pumping rights.

Supply augmentation is therefore conducted on an annual basis as a part of the normal water management planning and not as a response triggered by a shortage level.

4-3 Demand Reductions

4-3.1 Normal Water Shortage Condition

Under normal conditions, permanent water conservation requirements are effective at all times and are permanent. Violations of the requirements are considered wasteful and an unreasonable use of water.

Permanent Water Conservation Requirements

A. Automated Watering (Irrigation) System Operation

1. Automated watering or irrigation of any lawn, landscape, or other vegetated area with potable water is prohibited between the hours of 9:00 a.m. and 4:00 p.m. Pacific Standard time on any day. Automated landscape irrigation systems may nevertheless be operated during these hours for very short periods of time, such as ten minutes, for the express purpose of adjusting or repairing a landscape irrigation system.

2. Automated Watering Duration Limits

   a) High Flow Sprinkler Heads (Greater than two gallons per minute). All watering activities are required to avoid visible runoff or pooling on adjacent hard surfaces. Automated sprinkler heads with flow rates greater than two gallons per minute may be operated up to a maximum of ten minutes (per valve station) on each authorized day so long as no visible runoff or pooling occurs. If runoff or pooling is visible, the sprinkler run time shall be further reduced to eliminate runoff and pooling. Watering is prohibited from 9:00 a.m. to 4:00 p.m. daily.

   b) Low Flow sprinkler/rotator Heads (Less than two gallons per minute). All watering activities are required to avoid visible runoff and pooling on adjacent hard surfaces. Automated sprinkler heads with flow rate less than two gallons per minute may be operated up to a maximum of twenty minutes (per valve station) on each authorized day so long as no visible runoff or pooling occurs. If runoff is visible, the sprinkler station run time shall be further reduced to eliminate runoff and pooling. Watering is prohibited from 9:00 a.m. to 4:00 p.m. daily.

   c) Drip Watering Systems (Less than two gallons per hour). Properly installed automated drip systems with flow rates less than two gallons per hour are exempt from day and duration limitations so long as no visible runoff or pooling is created. Watering is prohibited from 9:00 a.m. to 4:00 p.m. daily.

B. Handheld Watering of Lawn, Tree and Vegetable Gardens. All watering activities are required to avoid visible runoff on adjacent hard surfaces. Use of a handheld bucket or similar container, a hand held hose equipped with a positive self-closing water shut off nozzle or device is exempt from day, time of day and duration limitations. Vegetable gardens may be watered by hand or with soaker hoses without day, time of day and duration limitations. Trees may be watered by hand, soaker hose under the drip-line of the tree canopy or with automatic tree bubblers without limitation.

C. Excessive Water Flow or Runoff or Pooling. Any watering; irrigating of any lawn, landscape or area with vegetation; or any other use of water in a manner that causes or results in excessive water flow, runoff or pooling onto an adjoining surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, streets, alleys, gutters, or ditches is prohibited.

D. Washing Down Hard or Paved Surfaces Prohibited. Washing of driveways, sidewalks, parking areas, patios, other outdoor impermeable surface areas, kitchens or objects, such as kitchen non-skid mats with a hose, is prohibited unless using a water-conserving pressurized cleaning device as defined herein. A water-conserving pressurized cleaning device is defined as a device that discharges water at a minimum of one thousand pounds per square inch or a device that has been rated at using less than three gallons of water per minute. A simple spray nozzle does not qualify as a water conserving pressurized cleaning device.

E. Obligations to Fix Leaks, Breaks, or malfunctions. Excessive use, loss, or escape of water through leaks, breaks, or other malfunctions in the water user's plumbing or distribution system for any period of time after such escape of water should have reasonably been discovered and corrected and in no event more than seven days of receiving notice from the City is prohibited.

F. Re-circulating Water Required for Water Fountains and Decorative Water Features. Operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited.

G. Limits on Washing Vehicles. Using water to wash or clean a vehicle, including but not limited to any automobile, motorcycle, truck, van, bus, recreational vehicle, boat or trailer, camping or cargo trailer,

whether motorized or not is prohibited, except by use of a hand-held bucket or similar container, or a hand-held hose equipped with a positive self-closing water shut off nozzle or device. No excessive water flow or runoff as defined in Section 13.03.040 is permitted. This provision does not apply to any commercial car washing facility.

H. Drinking Water Served Upon Request Only. Eating or drinking establishments, including but not limited to a restaurant, hotel, café, bar, club , or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

I. Commercial Lodging Establishments Must provide Option to Not Launder Linen Daily. Hotels, motels, and other commercial lodging establishments must provide customers the option of not having towels and linen laundered daily. Commercial lodging establishments shall prominently display notice of this option in each bathroom using clear and easily understood language.

J. No Installation of Single Pass Cooling System. Installation of single pass cooling systems is prohibited in buildings requesting new water service.

K. No Installation of Non-re-circulating Commercial Car Wash and Laundry Systems. Installation of non-re-circulating water systems is prohibited in new commercial conveyor car wash and new commercial laundry systems.

L. Restaurants Required to Use Water Conserving Dish Wash Spray Valves. Food preparation establishments, such as restaurants or cafes, are prohibited from using non-water conserving dish wash spray valves.

M. Commercial Car Wash Systems. Effective on January 1, 2011, all commercial conveyor car wash systems must have installed and operational re-circulating water systems, or must have secured an extension of this requirement from the City.

N. Large Landscape Areas – Rain Sensors: Effective January 1, 2011, large landscape areas, such as parks, cemeteries, golf courses, school grounds, and playing fields, that use landscape irrigation systems to water or irrigate, must use landscape irrigation systems with rain sensors that automatically shut off such systems during periods of rain or irrigation timers which automatically use information such as evapotranspiration sensors to set an efficient water use schedule or must have secured an extension of this requirement from the City.

O. Reporting Mechanism – Hotline. The City will establish a water waste hotline for residents to report violations of this WSCP. This hotline may be set-up and offered through a dedicated phone number and/or through submittal on the City's website.

P. All automated outdoor irrigation during and within forty-eight hours following measurable rainfall is prohibited.

Q. Exceptions to Permanent Restrictions

1. Watering with a hand-held hose or a refillable watering vessel, such as a bucket or a tree irrigator, is allowed at any time on any day of the week.

2. Drip irrigation systems with emitters of less than three gallons per hour capacity are exempt from run time and day restrictions due to increased efficiency.

3. Soaker hoses or automatic tree bubblers may be used to water trees so long as watering is done under the drip-line of the tree canopy

4. Watering a vegetable garden with a soaker hose is exempt from the watering limitations. (Ord. 2015-09-1478 § 3 (part); Ord. 2009-04-1399 § 1 (part))

4-3.2 Level 1 Water Shortage Condition

The Level 1 water shortage condition is equivalent to the Water Code Standard Water Shortage Level 1, which is defined as a water shortage up to 10 percent of normal reliability.

A Level 1 water supply shortage exists when the City determines, in its sole discretion, that due to drought or other water supply reductions, a water supply shortage exists and a consumer demand reduction of ten percent is necessary to ensure sufficient supplies will be available to meet anticipated mandatory Level 1 conservation measure identified in this WSCP.

The City may use the following criteria, as well as any other reliable information, date, or indices which would indicate the existence of a city or regional water shortage, to anticipate and implement the provisions within this section for a level 1 water supply shortage:

1. Reduction by the Metropolitan Water District of ten percent of imported water deliveries to its member agencies;
2. Reduction by the Central Basin Municipal Water District of ten percent of imported water deliveries to member agencies;
3. Over three years of drought, as defined by the National Weather Service, exists within the Los Angeles County Central Basin of the Colorado River Basin of the State of California.

Additional Water Conservation Measures - In addition to the prohibited uses of water in Section 4-3.1 – Permanent Restrictions, the following water conservation requirements apply during a declared Level 1 Water Supply Shortage:

A. Limits on Watering Days. Watering or irrigating of any lawn, landscape or other vegetated area with potable water is limited to the following three days per week: Tuesday, Thursday and Saturday. This provision does not apply to landscape irrigation systems that exclusively use very-low flow drip type irrigation systems if no emitter produces more than one gallon of water per hour. Automated landscape irrigation systems may only be operated on other days for very short periods of time, such as ten minutes, or as reasonably required for the express purpose of adjusting or repairing a landscape irrigation system.

B. Obligation to Fix Leaks, Breaks or Malfunctions. All leaks, breaks or other malfunctions in the water user's plumbing or distribution system must be repaired within seventy-two hours of notification by the City unless other arrangements are made with the City.

C. Limits on filling Ornamental Lakes or Ponds. Filling or re-filling ornamental lakes or ponds is prohibited, except to the extent necessary to sustain aquatic life that has been actively managed or cared for within the ornamental lake or pond, prior to the City declaring a supply shortage level pursuant to this section.

D. Other Prohibited Uses. The City may implement other prohibited water uses as determined by the City after providing notice to the City's water customers.

E. Exemptions to Level 1 Shortage Restrictions

1. Watering with a hand-held hose or a refillable watering vessel, such as a bucket or a tree irrigator is allowed at any time on any day of the week.

2. Drip irrigation systems with emitters of less than two gallons per hour capacity are exempt from duration and day of week restrictions due to increased efficiency.

3. Soaker hoses or automatic tree bubblers may be used to water trees so long as watering is done under the drip-line of the tree canopy.

4. Watering a vegetable garden with a soaker hose is exempt from the watering limitations. (Ord. 2015-09-1478 § 3 (part); Ord. 2009-04-1399 § 1 (part))

4-3.3 Level 2 Water Shortage Condition

The Level 2 water shortage condition is equivalent to the Water Code Standard Water Shortage Level 2, which is defined as a water shortage of 10 to 20 percent of normal reliability, respectively.

A Level 2 water supply shortage exists when the City determines, in its sole discretion, that due to drought or other water supply reductions, a water supply shortage exists and a consumer demand reduction of more than ten percent, but less than twenty percent is necessary to ensure that sufficient supplies will be available to meet anticipated demands. Upon declaration by the City of a Level 2 Water Supply Shortage condition, the City shall implement the mandatory Level 2 conservation measures identified in this Section:

1. Reduction by the Metropolitan Water District of more than ten percent, but less than twenty percent of imported water deliveries to its member agencies;

2. Reduction by the Central Basin Municipal Water District of more than ten percent, but less than twenty percent of imported water deliveries to member agencies;

3. Over four years of drought, as defined by the National Weather Service, exists within the Los Angeles County Central Basin of the Colorado River Basin of the State of California.

Additional Water Conservation Measures – In addition to the prohibited uses of water identified in Sections 4-3.1 and 4-3.2, the following additional water conservation requirements apply during a declared Level 2 water supply shortage:

A. Eating or drinking establishments, including but not limited to a restaurant, hotel, café, bar, club, or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

B. Watering Days. Watering or irrigating of any lawn, landscape or other vegetated area with potable water is limited to the following two days per week, Tuesday and Saturday. This provision does not apply to landscape irrigation systems that exclusively use very-low flow drip type irrigation systems when no emitter produces more than two gallons of water per hour. Automated landscape irrigation systems may be operated on other days for very short periods of time, such as ten minutes or as reasonably required, for the express purpose of adjusting or repairing a landscape irrigation system.

C. Obligation to Fix Leaks, Breaks or Malfunctions. All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within forty-eight hours of notification by the City unless other arrangements are made with the City.

D. Limits on Washing Vehicles. Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not, is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a re-circulating water system to capture or reuse water.

E. Limits on Filling Residential Swimming Pools and Spas. Re-filling of more than one foot and initial filling of residential swimming pools or outdoor spas with potable water is prohibited.

F. Limits on Filling Ornamental Lakes or Ponds. Filling or re-filling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life that has been actively managed within the water feature prior to declaration of a supply shortage level under this ordinance.

G. Median Irrigation. The irrigation with potable water of ornamental turf on public street medians is prohibited.

H. Other Prohibited Uses. The City may implement other prohibited water uses as determined by the City after providing notice to the City's water customers.

I. Exemptions to Level 2 Shortage Restrictions

1. Watering with a hand-held hose or a refillable watering vessel, such as a bucket or a tree irrigator is allowed at any time on any day of the week.

2. Drip irrigation systems with emitters of less than three gallons per hour capacity are exempt from duration and day of week restrictions due to increased efficiency.

3. Soaker hoses or automatic tree bubblers may be used to water trees so long as watering is done under the drip-line of the tree canopy or you may use automatic tree bubblers.

4. Watering a vegetable garden with a soaker hose is exempt from the watering limitations. (Ord. 2015-09-1478 § 3 (part); Ord. 2009-04-1399 § 1 (part))

4-3.4 Level 3 Water Shortage Condition

The Level 3 water shortage condition is equivalent to the Water Code Standard Water Shortage Level 3 through 6, which is defined as a water shortage greater than 20 percent of normal reliability, respectively.

A level 3 water supply shortage condition exists when the City declares a water shortage emergency condition exists pursuant to provisions set forth under California Water code Section 350 through 357, including providing notice by publication to the City's water customers, that more than a twenty percent consumer demand reduction is required to ensure sufficient supplies for human consumption, sanitation, and fire protection. The City must declare a water supply shortage emergency in the manner and on the grounds provided in California Water Code Section 350.

A twenty percent or greater shortage of water supplies can be anticipated when one or more of the following events occur:

1. Reduction by the Metropolitan Water District of twenty percent or more of imported water deliveries to its member agencies;

2. Reduction by the Central Basin Municipal Water District of twenty percent or more of imported water deliveries to member agencies;

3. Over five years of drought, as defined by the National Weather Service, exists within the Los Angeles County Central Basin of the Colorado River Basin of the State of California.

Additional Water Conservation Measures – In addition to the prohibited uses of water identified in Section 4-3.1, 4-3.2 and 4-3.3, the following water conservation requirements apply during a declared Level 3 water supply shortage emergency condition:

A. Watering or irrigating of any lawn, landscape or other vegetated area with potable water is prohibited. This restriction shall not apply to the following categories of use unless the City has determined that recycled water is available and may be lawfully applied to the use:

   1. Maintenance of vegetation, including trees and shrubs, that are watered using a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or a very-low flow drip type irrigation system when no emitter produces more than two gallons of water per hour subject to the watering day and excessive runoff restrictions in Section 4-3.3.

   2. Maintenance of existing landscape necessary for fire protection;

   3. Maintenance of existing landscape for soil erosion control;

   4. Maintenance of plant materials identified to be rare or essential to the wellbeing of rare animals;

   5. Maintenance of landscape within active public parks and playing fields, day care centers, school grounds, cemeteries, and golf courses, provided that such irrigation does not exceed two days per week according to the schedule established in Section 4-3.3 and time restrictions in 4-3.3; and

   6. Public works projects and actively irrigated environmental mitigation projects.

B. Obligation to Fix Leaks, Breaks or Malfunctions. All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within twenty-four hours of notification by the City unless other arrangements are made with the City.

C. Discontinue Service. The City, in its sole discretion, may discontinue service to the City's water customers who willfully violate provisions under a declared level 3 water supply shortage. The city may also assert other penalties and violations as set forth in this section against water customers who willfully violate provisions under a declared level 3 water supply shortage.

D. No new Annexations. Upon declaration of a level 3 water supply shortage condition, the City will suspend consideration of annexations to its service area. This provision does not apply to boundary corrections and annexations that will not result in any increased use of water.

E. Other Prohibited uses. The City may implement other prohibited water uses as determined by the City after providing notice to the City's water customers. (Ord. 2015-09-1478 § 3 (part); Ord. 2009-04-1399 § 1 (part)).

4-4 Operational Changes

The City does not implement any operational changes to address water shortages.

4-5 Additional Mandatory Restrictions

The City has permanent water conservation requirements as described in Section 4-3.1. These requirements are in place under normal conditions and therefore always apply to all customers.

4-6 Emergency Response Plan

The City's Emergency Response Plan (ERP) was updated September 20, 2021. It is included as Attachment 4A. The purpose of the ERP is to protect the health of employees and the public, limit the impact of a crisis on services and resources, and ensure a quick recovery following an emergency.

Compliance with the ERP will hasten the recovery of system facilities following a disaster, such as fire, flood, storm, epidemic, riot, earthquakes, terrorism or other conditions.

The City will update the ERP in accordance with America's Water Infrastructure Act of 2018 Section 2013(b) with findings of the risk and resilience assessment.

4-7 Seismic Risk Assessment and Mitigation Plan

Water Code Section 10632.5(a)

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

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

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

A copy of the City of Signal Hill's Hazard Mitigation Plan, dated January 2018 is included as Attachment 4B. Earthquake hazards and seismic risk are addressed within this plan.

SECTION 5
COMMUNICATION PROTOCOLS

5-1 Water Code

Water Code Section 10632 (a) (5)

Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

5-2 Procedures for Determination of a Water Supply Shortage

The City Council may declare a water shortage at any time that it is determined that the water supply available to the City is likely to be insufficient to meet the expected demands of the City's customers due to any cause, including but not limited to:

- Results of annual water supply and demand assessment
- Facility failure

The existence of Level 1, Level 2 or Level 3 water supply shortage conditions may be declared by resolution of the City Council adopted at a regular or special public meeting held in accordance with State law. The mandatory conservation requirements applicable to Level 1, Level 2 or Level 3 conditions shall take effect on the fifteenth day after the date the shortage is declared.

5-3 Procedures for Notification of a Water Supply Shortage to the Public

Within ten (10) days following the declaration of the shortage level, the City shall publish a copy of the resolution in a newspaper used for publication of official notices. If the City establishes a water allocation, it shall provide notice of the allocation by including it in the regular billing statement or by any other mailing to the address to which the City customarily mails the billing statement for fees or charges for on-going water service.

Ord. 2015-09-1478 § 3 (part); Ord. 2009-04-1399 § 1 (part))

5-4 Procedures for Notification of a Water Supply Shortage to Public Entities and Officials

Within five days following the declaration of the shortage level, the City shall notify the County of Los Angeles. The Director of Water Resources at the Los Angeles County Department of Public Works will be contacted by telephone and a follow-up letter.

SECTION 6
COMPLIANCE AND ENFORCEMENT

6-1 Water Code

Water Code Section 10632(a)(6)

For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

6-2 Penalties and Violations

6-2.1 Penalties

A. Misdemeanor.

Any violation of this WSCP may be prosecuted as a misdemeanor punishable by imprisonment in the county jail for not more than thirty days, or by fine not exceeding one thousand dollars or both, under the provisions of Chapter 1.16 of the Signal Hill Municipal Code.

B. Civil Penalties.

Civil penalties for failure to comply with any provisions of the WSCP shall be as follows:

1. First Violation

   The City will issue a written warning and deliver a copy of this WSCP by certified mail. Such notice shall refer to the code section(s) violated and facts supporting the issuance of notice of violation.

2. Second Violation

   A second violation within a twelve-month period is punishable by a fine not to exceed one hundred dollars. Such notice shall refer to the code section(s) violated and facts supporting the issuance of notice of violation. The correction notice shall also describe the action(s) necessary to correct the violation and state the final date by which the correction must be completed and inform the offender that he or she is subject to a fine if the correction is not made by that date.

3. Third Violation

   A third violation within a twelve-month period is punishable by a fine not to exceed two hundred and fifty. Such notice shall refer to the code section(s) violated and facts supporting the issuance of notice of violation. The correction notice shall also describe the action(s) necessary to correct the violation and state the final date by which the correction must be completed and inform the offender that he or she is subject to a greater fine if the correction is not made by that date.

4. Fourth and Subsequent Violation

   A fourth violation and any subsequent violation within a twelve-month period is punishable by a fine not to exceed five hundred. Such notice shall refer to the code section(s) violated and facts supporting the issuance of notice of violation. The correction notice shall also describe the action(s) necessary to correct the violation and state the final date by which the correction must be completed and inform the offender that he or she is subject to (1), (2) and Section 6-2.2 if the correction is not made by that date.

   .

a. Water Flow Restrictor

In addition to any fines, the City may install a water flow restrictor device of approximately one gallon per minute capacity for services up to one and one-half inch size and comparatively sized restrictors for larger services after written notice of intent to install a flow restrictor for a minimum of forty-eight hours.

b. Discontinuing Service

In addition to any fines and the installation of a water flow restrictor, the City may disconnect and/or terminate a water customer's water service for willful violation of mandatory restrictions in this WSCP.

6-2.2 Cost of Flow Restrictor and Discontinuing Service

A person or entity that violates this WSCP is responsible for payment of the City's charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnecting service per the City's schedule of charges then in effect. The charge for installing and/or removing any flow restrictor device shall be paid to the City before the device is removed. Nonpayment will be subject to the same remedies as nonpayment of basic water rates.

6-2.3 Separate Offenses

Each day that a violation of this WSCP occurs is a separate offense.

6-2.4 Notice and Hearing

The City will issue a notice of violation by mail or personal delivery at least fifteen calendar days before taking enforcement action and said notice shall describe the action to be taken. A customer may appeal the notice of violation by filing a written notice of appeal with the City no later than the close of business on the day before the date scheduled for enforcement action. Any notice of violation not timely appealed will be final. Upon receipt of a timely appeal, a hearing on the appeal shall be scheduled in a timely manner, and the City shall mail written notice of the hearing date to the customer at least fifteen calendar days before the date of the said hearing.

Pending receipt of a written appeal or pending a hearing pursuant to an appeal, the City may take appropriate steps to prevent the unauthorized use of water as appropriate to the nature and extent of the violations and the current declared water level condition.

(Ord. 2015-09-1478 § 3 (part); Ord. 2009-04-1399 § 1 (part))

6-3 Hardship Waiver

A. Undue and Disproportionate Hardship

If, due to unique circumstances, a specific requirement of this WSCP would result in undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water users, then the person may apply for a waiver to the requirements as provided in this section.

B. Written Finding

The waiver may be granted or conditionally granted only upon a written finding of the existence of facts demonstrating an undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water user due to specific and unique circumstances of the user or the user's property.

1. **Application**. Application for a waiver shall be on a form prescribed by the City and shall be accompanied by a non-refundable processing fee in amount set by resolution of the City.
2. **Supporting Documentation.** The application shall be accompanied by photographs, maps, drawings, and other information, including a written statement of the applicant.
3. **Required Findings for Variance.** An application for a waiver shall be denied unless the approving authority, either City Manager or the City Manager's designee, finds, based on the information provided in the application, supporting documents, or such additional information as may be requested, and on water use information for the property as shown by the records of the City, all of the following:
    a. That the waiver does not constitute a grant of special privilege inconsistent with the limitations upon other residents and businesses.
    b. That because of special circumstances applicable to the property or its use, the strict application of this WSCP would have a disproportionate impact on the property or use that exceeds the impact to residents and businesses generally.
    c. That the authorizing of such waiver will not be of substantial detriment to adjacent properties, and will not materially affect the ability of the City to effectuate the purpose of this WSCP and will not be detrimental to the public interest; and
    d. That the condition or situation of the subject property or the intended use of the property for which the waiver is sought is not common, recurrent or general in nature.
4. **Approval Authority.** The City Manager or their designee shall exercise approval authority and act upon any completed application no later than fifteen business days after submittal and may approve, conditionally approve, or deny the waiver. The applicant requesting the waiver must be promptly notified in writing of any action taken. Unless specified otherwise at the time a waiver is approved, the waiver applies to the subject property during the term of the mandatory water supply shortage condition.
5. **Appeals to the City.** An applicant may appeal a decision or condition of the City Manager of the city Manager's designee, on a waiver application to the City Council within fifteen calendar days of the decision upon written request for a hearing. The request shall state the grounds for the appeal. At a public meeting, the City Council shall act as the approval authority and review the appeal de novo by following the regular waiver procedure. The decision of the City Council is final.

Ord. 2015-09-1478 § 3 (part); Ord. 2009-04-1399 § 1 (part))

SECTION 7
LEGAL AUTHORITIES

7-1 Water Code

Water Code Section 10632(a)(7)

(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

Water Code Section Division 1, Section 350

Declaration of water shortage emergency condition. 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.

7-2 Legal Authorities

Resolution No. 2021-11-6648 "Water Shortage Contingency Plan" provides a mechanism for the City to implement a water conservation plan based on the severity of a water supply shortage.

7-3 Declaration of a Water Shortage Emergency

The City shall declare a water shortage emergency in accordance with Water Code Section Division 1, Section 350.

7-4 Coordination for a Local Emergency

The City shall coordinate with the County of Los Angeles for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

The contact information for the County of Los Angeles are as follows:

1. County of Los Angeles

   Mr. Dan Lafferty – Deputy Director of Water Resources

   dlaff@pw.lacounty.gov
   (626) 458-4012
   900 S. Freemont Avenue
   Alhambra, CA 91803

Coordination protocols for local emergencies will follow City's Emergency Response Plan (See Attachment 4A).

SECTION 8
FINANCIAL CONSEQUENCES OF WSCP ACTIVATION

8-1 Water Code

Water Code Section 10632(a)(8)

A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1. (retail urban suppliers only)

8-2 Potential Revenue Reductions and Expenses

When shortage response actions are activated, revenue is reduced because water use is reduced throughout the system. There is a monthly fixed charge that remains the same, but the water use charge will go down as each customer conserves water. The City's overall revenue is reduced at the same time.

When shortage response actions are activated, the potential expense increases are as follows:

1. Notification costs for newspaper articles, billing fliers, and changes to website.
2. Increased staff costs for tracking, reporting, and to patrol and enforce actions.

8-3 Mitigation Actions

Historically, the City has not had a significant enough reduction in revenue due to shortage response actions to prompt mitigation actions. This is not expected to change significantly in the future either since the City has permanent water conservation requirements in place.

If in the future, mitigation actions are needed to address revenue reductions and expense increases associated with activated shortage response actions, the City's options are as follows:

1. Using financial reserves
2. Reducing operation and maintenance expenses
3. Water rate adjustments
4. Triggering drought rate structures or surcharges
5. Deferring capital improvement projects

8-4 Cost of Compliance

There are no additional costs anticipated beyond what is discussed in Section 8-2 for discouraging excessive water use during a drought emergency. The City water fees and charges inherently discourages excessive water use by using a tiers to charge customers. The tiers are as shown in Table 8-1.

Table 8-1
Water Usage Consumption Charge per Billing Unit by Tier and Customer Type

Effective Date	3/1/2020	1/1/2021	1/1/2022	1/1/2023	1/1/2024
Residential - Single Family and Multi-Family					
Tier 1 0 - 15 units	$2.94	$3.38	$3.79	$4.07	$4.38
Tier 2 > 16 units	$4.69	$5.40	$6.05	$6.50	$6.99
Commercial, Industrial, and Institutional					
Tier 1 0 - 15 units	$2.94	$3.38	$3.79	$4.07	$4.38
Tier 2 16 - 150 units	$4.69	$5.40	$6.05	$6.50	$6.99
Tier 3 > 151 units	$6.92	$7.95	$8.91	$9.58	$10.29
Irrigation					
Tier 1 0 - 15 units	$2.94	$3.38	$3.79	$4.07	$4.38
Tier 2 > 16 units	$4.47	$5.15	$5.76	$6.20	$6.66

SECTION 9
MONITORING AND REPORTING

9-1 Water Code

Water code Section 10632(a)(9)

For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

9-2 Monitoring and Reporting

The City submits monthly reports to the California State Water Resources Control Board per the regulation on Monthly Urban Water Conservation Reporting that went into effect July, 2014. These reports include the following items:

1. Reporting Month
2. Water Shortage Level
3. Population
4. Total Potable Water Production
5. Commercial Agricultural Water
6. Residential Use Percentage
7. CII Water
8. Recycled Water
9. Non-revenue Water
10. Estimated Residential Gallons per Capita per Day

9-3 Data Collection

Well production data is collected and tracked monthly for each individual well owned by the City. The flow meters are inspected and calibrated on an annual basis.

Customers are billed monthly and the water sales is therefore tracked on a monthly basis.

9-4 Customer Water Use

At the end of each monthly meter reading cycle, an audit of the meter reads is done. Any meter reads that are higher than the software created average for each account is placed on a “reread list”. These meters are inspected by City staff for possible leaks. The meter is observed to see if the leak indicator on the meter is moving. If it is, the meter will observed to see if usage stops or is constant. If the meter usage is constant, the customer will be notified of a possible leak. Customer are notified in person, by phone, or by door hanger.

SECTION 10
WSCP REFINEMENT PROCEDURES

10-1 Water Code

Water Code Section 10632(a)(10)

Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.

10-2 WSCP Refinement Procedures

The City will review the following data from before, after, and during the time a shortage stage was in effect:

1. Reduction in total water use
2. Reduction in gallons per capita per day
3. Reduction in water use by meter type: single family residential, multi-family residential, commercial, government, and irrigation

Review and analysis of the aforementioned data would allow the City to evaluate the effectiveness of the water conservation measures specified for the shortage stage that was implemented.

Review of data by meter type would be used to determine where the most reductions are occurring and where water conservation measures may need to be adjusted to increase water savings during a shortage. For any meter type that did not meet or is not meeting the required water reduction percentage, the City will review the related conservation measures and adjust as needed.

In addition to reviewing conservation measures, the City will consider increasing its efforts in public communication and education in regards to the water conservation requirements and best management practices.

At a minimum, the City will review data annually and refine its WSCP procedures as needed.

Attachment 4A
City of Signal Hill
Emergency Response Plan

APPENDIX D

PLAN OVERVIEW

Table of Contents **Page**

1.0 PURPOSE OF THE EMERGENCY RESPONSE PLAN

The purpose of this Emergency Response Plan (ERP) is to:

- Protect the health of employees and the public
- Limit the impact of a crisis on services and resources
- Ensure a quick recovery following an emergency

and to provide guidelines for personnel who might respond to abnormal events at the City of Signal Hill Public Works Department (Signal Hill) facilities, including:

- City of Signal Hill Public Yard
- Well #7 and Well #8
- MWD Interties
- Gundry Reservoir Treatment Plant and Pumping Station
- Temple Reservoir and Pumping Station
- Hilltop Reservoir and Pumping Station

This ERP provides a reference for employees and contractors and for Municipal Emergency Response organizations, such as the local Fire and Law Enforcement Agencies. This ERP was also written with the intent of satisfying the emergency response plan requirements of:

- California Department of Health Services
- US EPA Security Vulnerability Assessment Requirements

Throughout this document, the term “Emergency Response Team (ERT)” is used to describe the Signal Hill personnel who respond to the emergency to inspect the area, ensure that it is safe, begin repairs, and/or report damage to the Emergency Operations Center (EOC) for further direction. The term does not imply that these are trained emergency response personnel in terms of fire or law enforcement personnel.

Per the CA Government code (Section 2403), this Emergency Response Plan was developed to incorporate the Standardized Emergency Management Systems (SEMS) positions to allow for scalability as a disaster grows to a larger area. Additionally, all exercises which test this plan or train personnel to put this plan into practice will also incorporate SEMS and therefore be compliant with Section 2447 of the Government code.

2.0 LAWS AND AUTHORITIES

Authority for this plan includes the following:

1. Federal Civil Defense Act of 1950 (Public Law 920, as amended).
2. Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (Public Law 93-288, as amended).
3. California Emergency Services Act, Chapter 7 of Division 1 of Title 2 of the Government Code.
4. California Code of Regulations Title 19, Chapter 2, Subchapter 3, §2620 et seq.
5. California Department of Health Services, Office of Drinking Water, Public Health Notification.
6. California Emergency Plan.
7. Standardized Emergency Management System (SEMS) Regulations, Chapter 1 of Division 2 of Title 21 of the California Code of Regulations (CCR).
8. California Government Code §8607(a).
9. The Public Health Security and Bioterrorism Preparedness and Response Act (HR 3448).

2.1 City of Signal Hill Public Works Department

The City of Signal Hill Public Works Department will have and maintain a standardized Emergency Response and Recovery Plan containing vital information for responding to, and recovering from, an emergency. A city-wide Standardized Emergency Management System (SEMS) will be used to ensure compatibility with state and local emergency response systems (in accordance with State of California Government Code 8607). Signal Hill will train all employees regarding their duties during and after an emergency.

Goals of the Emergency Response and Recovery Plan

The goals of the Emergency Response and Recovery Plan are to:

- rapidly restore service after an emergency
- ensure adequate water supply for fire suppression
- minimize water or electrical system damage
- minimize impact and loss to customers
- provide emergency public information concerning customer services

2.2 City of Signal Hill Operational Area

The establishment of the City of Signal Hill Operational Area fulfills the SEMS requirements for the City of Signal Hill, as well as the responsible public agencies within the city and provides the following benefits:

- A partnership between the signatory agencies for exchanging disaster intelligence, mutual aid requests, and resource requests in emergencies
- Cooperative multi-agency emergency management training and exercises
- The SEMS regulations are met and followed, thereby ensuring compatibility and integration with agencies throughout the state
- The Police serves as the Operational Area Coordinator and will provide representation of all affected entities in decision-making and coordination before, during, and after disaster events occur
- Participation in the Operational Area Council via elected representative for policy-level authority in the Operational Area

The Operational Area Disaster Council will consist of elected members representing the cities and special districts who are participants in the Operational Area Agreement. Signal Hill, upon authorization from its City Council, will be a participant in the Operational Area Agreement and coordinate with the Operational Area in accordance with the SEMS regulations. During activation of this plan and the Signal Hill EOC, Signal Hill will notify the Operational Area EOC and coordinate emergency response operations, via the Operational Area, with all affected agencies. Further, Signal Hill will file an after-action report with the Operational Area within 90 days after the disaster. These procedures are consistent with the SEMS regulations and the City of Signal Hill Operational Area procedures.

2.3 State of California

The State of California's disaster authority is established in the California Emergency Services Act (Government Code Section 8550, et seq.). Contained in the law are the policies, regulations, and basic procedures for the following state plans, agreements, and programs:

- California Emergency Plan
- California Master Mutual Aid Agreement
- Natural Disaster Assistance Act
- Disaster Service Workers

- Standardized Emergency Management System (SEMS)

Signal Hill is a participant within the established framework of the above laws, plans, and authorities. As regulated by SEMS, Signal Hill must standardize its emergency management response system in accordance with the regulations to effectively participate in the statewide program for multi-agency coordination and mutual aid, and to meet certain eligibility requirements for application for the Natural Disaster Assistance Act (NDAA) grant funds. As discussed above, the Signal Hill's membership in the Operational Area, along with this plan and a training program, will meet the requirements of SEMS.

During disasters that require activation at the State level, the State (through the Governor's Office of Emergency Services (OES)) will work within its mutual aid regions with the Operational Areas to receive reports and requests for mutual aid and other resources, and to coordinate recovery efforts. City of Signal Hill is part of the Region I Mutual Aid Region and the business office for OES Region I is located in Los Alamitos. The City of Signal Hill Operational Area will coordinate between Region I and the local governments and agencies. Signal Hill is to report to and coordinate all operations with the state through the City of Signal Hill Operational Area. The state coordinates with the Federal Emergency Management Agency (FEMA) for federal level resources, mutual aid, and public agency disaster assistance grants and funding.

The Governor must declare affected counties as disaster areas to activate the state emergency authorities, plans, and programs. The Governor activates the Natural Disaster Assistance Act (NDAA) program, which provides up to 25% reimbursement of eligible expenses for disaster costs. The funding for NDAA is made available by state legislative appropriation, either as a stand-alone fund or in conjunction with federal funds.

2.4 Federal Government

The Federal Emergency Management Agency (FEMA) manages the federal-level authority for emergency management. FEMA is organized into 10 mutual aid regions throughout the nation. Region IX is the mutual aid region for the State of California and is headquartered in San Francisco. During disasters in California, the Governor petitions the President of the United States to declare the state a disaster area for federal-level resources to become available.

The presidential declaration activates the Federal Emergency Response Plan and allows the state to access federal-level resources for emergency response. For Signal Hill, this could include the US Army Corps of Engineers resources, contracted services, and other resources provided by unaffected states. Signal Hill does not coordinate directly with FEMA during

emergency response operations. All coordination will be handled by the State OES through its mutual aid regions to the Operational Areas within the counties.

The Robert T. Stafford Act (originally Public Law 93-288, now amended) provides the federal authority and program for federal congressional appropriation of public funds for disaster assistance. This program provides for an approximate reimbursement of 75% of eligible expenses for approved categories of public facility protection and/or repair and restoration of damaged facilities. The County Operational Area and the State of California will notify Signal Hill when the federal programs are activated and will assist with the application process.

The Stafford Act has been amended by the Disaster Preparedness Act of 2002, which requires states and local governments (including water facilities) to have a FEMA approved Hazard Mitigation Plan in place in order to be eligible for grant funding of hazard mitigation projects. These are projects funded for improvements for qualified public facilities that were not damaged, but are considered at risk to future events.

3.0 EMERGENCY RESPONSE OBJECTIVES

The overall emergency response objectives of Signal Hill are to:

- Maintain, restore, or establish water services to meet requirements of emergency services and the essential needs of the community.
- Restoration of fire flows.
- Restoration of service to hospitals.
- Coordinate the pooling of utility personnel, equipment, and materials, when necessary.
- Provide an inventory of potable water sources during emergency conditions.

3.1 Policies and Procedures

Policies governing operations during peacetime emergencies are provided below:

- All personnel, equipment, and supplies will be reserved primarily for operations and restoration.
- Under major disaster conditions affecting a widespread area, personnel who are stranded, or are unable to report to work because of loss of the transportation network, etc., should make every attempt to find alternate transportation routes and services.
- Information regarding the demand and availability, etc. of water will be furnished to government officials for use in informing the public regarding the conservation of water.
- When required, personnel assistance and supplemental equipment and supplies will be requested through the Emergency Operations Center (EOC). Signal Hill may utilize pre-arranged Mutual Aid resources without assistance from the EOC, but will keep the EOC informed of such actions.
- Engineering equipment and supplies not available from Signal Hill, inventory, warehouse, or normal suppliers will be requested through the EOC.

The major duties to be accomplished during an emergency are:

- To protect life and property;
- To prevent unnecessary loss or contamination of stored treated water;
- To develop and maintain adequate amounts of potable water;
- To restore the entire system as soon as possible;
- To inform the public periodically of the status of the emergency action being taken and of the availability of potable water.

3.2 General Water System Response Considerations

Information contained in this section has been extracted and paraphrased from the "Emergency Handbook for Water Supply Managers."

- Act to protect life
- Preserve water pumping capabilities
  - Consider which facilities/equipment/etc. can be saved and which can be sacrificed.
  - Assess damage to sewer system if it could contaminate water supply.
- Isolate areas that will take longest to restore service and arrange for emergency water distribution
  - Establish collection points and ration water,
  - Spot plastic bottles at locations to serve immediate needs,
  - Get trucks with water tanks,
  - Start reserve pumping facilities,
- Identify areas that can be served with minimum of repair, and list repairs
- Set priorities on repair work
  - Plan to restore service area-by-area.
  - Prepare and keep current a plan to restore service.
  - Get input from Emergency Operation Center (EOC) on essential uses -Take into account the condition of feeder lines.
  - Keep in mind the need for fire protection.
  - Determine if imported water is available.
  - When work exceeds capabilities of your agency, notify the EOC.

4.0 COMMAND STRUCTURE

Signal Hill's response operations will be managed and directed by Signal Hill personnel using the Incident Command System (ICS) which is used by most public agencies including fire departments, police departments, etc. During the course of an incident or an emergency, the first responder will initially act as the Incident Commander, and the level of response may be escalated based on the judgment of the Incident Commander at the time. The first responder, subsequent line managers, and the Signal Hill Emergency Response Team (ERT) are expected, and fully empowered, to act as the Incident Commander and direct all response activities until termination of the emergency or until relieved by a person of higher authority. Signal Hill endorses the principle of "over responding," and employees should not hesitate to engage **whatever resources they may feel are necessary** to effectively mitigate an emergency.

Signal Hill's overall response to an emergency which poses a potential for widespread impact on its water distribution system will be directed by the EOC Director. The EOC Director will manage Signal Hill's wide response from the Signal Hill Emergency Operations Center (EOC), along with the Operations Section Chief.

During the assessment period, emergency response, and recovery phase, all appropriate staff will be under the direction of the EOC Director. This transfer of responsibilities is critical in order to ensure that all actions will be properly organized and coordinated. Key EOC Director responsibilities include:

- evaluating the risk potential;
- determining source and possible effect;
- delegating responsibility and authority;
- assessing priorities in terms of manpower, materials, and equipment;
- mobilizing and managing proper response effort, both internal and external; and
- establishing communications with management.

The EOC Director will be assisted by the Emergency Response Team. The primary objectives of the Emergency Response Team includes: assisting in the decision-making process prior to declaration of an emergency, providing expert assistance to the EOC Director during an emergency, and interfacing with outside agencies and other parties during an emergency response.

Unified Command

Note: Consistent with the 1994 Uniform Fire Code, Section 104.1, "Authority at Fires and Other Emergencies," municipal authorities have sole authority over the abatement of fires, acute hazardous conditions, and related emergencies, both on-site and off-site. The municipal authority does not have the latitude to relinquish its authority and/or responsibility for emergency response and abatement within its jurisdictional boundaries.

One of the key reasons for using a standardized ICS approach is the ability to adapt the emergency response to the particular event. Standardized ICS provides an organized platform for readily and rapidly integrating other emergency response organizations that also use a standardized ICS, e.g.: municipal emergency response organizations and industrial mutual aid companies.

Following the arrival of Municipal Emergency Services, and at the discretion of the Municipal Emergency Services Incident Commander, a Unified Command ICS structure may be established. For a Unified Command structure, key like-positions of both emergency support teams are paired and decisions are typically made jointly; however, the Municipal Emergency Services Incident Commander retains ultimate authority. These authorities apply to command and control issues, as well as location of the Incident Command Post. If a Unified Command is established, Incident Commanders should be co-located to facilitate Unified Command communication.

5.0 STANDARDIZED EMERGENCY MANAGEMENT SYSTEM (SEMS)

For Federal, State, and County declared emergencies Signal Hill employees may become emergency workers under those jurisdictions' control. It is expected that Signal Hill will function in a capacity of restoring water services to its customers.

5.1 Legal Basis

The legal basis for the implementation of SEMS in the Signal Hill Emergency Response Plan is through Senate Bill (SB) 1841, which was passed by the State Legislature and became effective January 1, 1993. The law was in response to emergency coordination problems encountered during the 1991 East Bay Hills Fire in Oakland, and is found in Section 8607 of the California Government Code. The intent of the law is to improve the coordination of State and Local Emergency Response to disasters in California.

Signal Hill operates in compliance with the Standardized Emergency Management System (SEMS) as described and required by Government Code Section 8607(a) for managing response to multi-agency and multi-jurisdiction emergencies in California.

5.2 Planning and Coordination Levels

SEMS is an integrated management system, which provides for five (5) emergency response levels, including:

1) Field Response Level: The Field Response Level comprises of emergency response personnel and resources carrying out tactical decisions and activities in direct response to an incident or threat.

2) Local Government Level: The definition of local government includes cities, counties, and special districts. They manage and coordinate the overall emergency response and recovery activities within their jurisdictions. Local governments are required to use SEMS when their EOCs are activated or when a Local Emergency has been proclaimed.

3) Operational Area Level: The operational area is an intermediate level of SEMS, which comprises of the City of Signal Hill and includes special districts. The operational area staff manages and/or coordinates information, resources, and priorities among local governments within the operational area, and serves as the communication link between the Local Government Level and the Regional Level. The City of Signal Hill Police Department's Office coordinates the operational area in this county.

4) Regional Level: The SEMS regions are also known as mutual aid regions. There are six regions, and their purpose is to provide for more effective application and coordination of mutual aid and other emergency-related activities. At the Regional Level, information and resources are managed and coordinated among operational areas within the Region and between the operational areas and the State Level. In addition, coordination of state agency support for emergency response within the Region occurs at this level. The State OES regional office at Los Alamitos serves as the Regional Level for the Southern Inland Region.

5) State Level: At the State Level (State Operations Center in Sacramento), state resources are assigned in response to the needs of other levels and mutual aid is coordinated among the mutual aid regions and between the Regional and the State Levels. The coordination and communication link between the state and federal disaster response systems also occurs at this level.

5.3 SEMS Features

SEMS provides effective Emergency Response Management, and assigns response functions into the various sections based upon commonalties, relationships, and agency assignments.

Essential Management Functions: At the field response level, the five primary ICS functions of command, operations, planning and intelligence, logistics, and finance and administration are used. At the local government, operational area, regional, and state levels, the term management is used instead of command, and the titles of other functions remain the same.

Management by Objectives: As applied to SEMS, management by objectives means that each level of operations establishes measurable and attainable objectives to be accomplished for each established operational time period. Each objective may have one or more strategies and performance actions. The operational period is the time period set by management for the completion of the objectives. It may vary from a few hours to days, as determined by the situation.

Action Planning: There are two variations of action planning under SEMS. First, Incident Action Plans, written or oral action plans at the field response level, reflect the overall strategy and specific tactical action and support information for the next specified operational period. Second, Emergency Operations Center (EOC) Action Plans are developed at the local, operational area, regional, and state levels to provide designated personnel with knowledge of the objectives to be achieved and the steps required. Action plans provide a basis for measuring achievement of objectives and overall performance, in addition to providing direction.

Modular Organization: Modular organization provides for only those elements of the organization required to meet the current objectives to be activated and provides that all organizational elements can be arranged in various ways under SEMS essential functions (Management, Operations, Planning and Intelligence, Resources and Logistics, and Finance and Administration). Each activated element must have a person in charge of it. A supervisor may be in charge of more than one element.

Organizational Unity: Every individual within the organization has a designated supervisor and hierarchy of command or management under the concept of organizational unity. Also, all organizational elements within each activated level are linked together to form a single overall organization within acceptable span-of-control limits.

Span-of-Control: Maintenance of an acceptable span-of-control is the responsibility of every supervisor. The optimum span-of-control is one to five, meaning one supervisor with supervisory authority over five subordinates. The recommended span-of-control at all levels is one to three through one to seven. A larger span-of-control can be acceptable if the supervised positions are all performing a similar function.

Personnel Accountability: The intent of personnel accountability is to ensure that proper safeguards are in place, so that all personnel are accounted for at any time. This is accomplished through organizational unity and hierarchy of management using check-in forms, position logs, and other status-keeping systems.

Common Terminology: Common terms are used for all organizational elements, position titles, and facility designations and resources, ensuring consistency and standardization within and between SEMS levels. It enables multi-agency, multi-jurisdictional organizations and resources to work together rapidly and effectively.

Resource Management: In SEMS, functional activities relate to managing resources at all levels. Resource management describes the ways in which field resources are managed and how status is maintained. The management activity varies from level to level, from directing to controlling to coordination, to inventorying, and the procedures vary accordingly.

Integrated Communication: At the field level, integrated communication is used in any emergency. Throughout EOCs and among SEMS levels, communication systems must be compatible and planning and information flow must occur in an effective manner. Integrated communication refers to hardware systems, planning for system selection and linking, and the procedures and processes for transferring information.

5.4 Key functions performed within SEMS

Command/Management is responsible for overall emergency policy and coordination through the joint efforts of governmental agencies and private organizations. This function is called Command in the field and Management in the EOC. Multi-jurisdiction incidents will involve a Unified Command element, which will bring together jurisdictional Incident Commanders to develop a coordinated Action Plan (as discussed in Section 11.0 of this Appendix) to make the best use of all available resources.

Operations is responsible for coordinating all jurisdictional operations in support of the response to the emergency through implementation of the organizational level's action plan. An Operations Section Chief, who is responsible for the management of all incident tactical activities, heads the operations Section. On multi-disciplinary incidents, the Operations Section Chief may have deputies. The Operations Section can be subdivided into Operational Groups (Fire OPS 1, Law 2, etc.) Branches, Groups and Units. Staging areas for resources are also under the management of the Operations Section.

Planning/Intelligence is responsible for collecting, evaluating, and disseminating information, developing the organizational level's action plan in coordination with the other functions, and maintaining documentation. The Planning/Intelligence Section is headed by a Planning Section Chief and is divided into several smaller units, depending upon the needs of the incident. Situation Status, Resources Status, and Damage Assessment are examples of the kinds of units that may be formed within this Section. The Planning Section collects and analyzes all data regarding incident operations, develops alternatives for tactical action plans, conducts planning meetings, and prepares the Incident Action Plan for incidents which will require extended operational periods.

Logistics is responsible for providing facilities, services, personnel, equipment, and materials. The Logistics Section is headed by the Logistics Section Chief, and is responsible for meeting the logistical needs of the Operations Section. The Logistics Section can be divided into Branches and Units, as the situation requires.

Finance/Administration is responsible for financial activities and administrative aspects not assigned to other functions. The Finance/Administration Section will be activated when required for purposes of maintaining records on personnel and equipment time; for providing payments to vendors for supplies and equipment usage; and for determining the cost considerations or various alternative strategies associated with incident planning.

Recovery (a sixth function added as a result of lessons-learned from response to the 1994 Northridge Earthquake) is responsible for coordinating the financial, short and long-term, recovery efforts of both private and public sector entities involved in a disaster. The Recovery Section will be activated at the initial stages of a disaster response and will start the process of collecting the required documentation for future OES and FEMA reimbursement filing.

Appendix B contains a detailed checklist of responsibilities and response actions for each ICS unit. For a specific EOC staffing matrix of primary and secondary personnel, see the EOC Staffing Matrix in the Quick Reference.

SEMS also incorporates the use of five (5) basic components:

1) Incident Command System (ICS)

2) Multi-Agency Coordination System (MACS)

3) Master Mutual Aid Agreement (Mutual Aid)

4) Operational Area (OA)

5) Operational Area Satellite Information System (OASIS)

The following is a description of the individual components of SEMS

1) The Incident Command Systems (ICS) was developed initially as part of the FIRESCOPE program during the 1970's by an inter-agency working group representing Local, State, and Federal Fire Services in California. The ICS was adopted by the Fire Services in California as their standard response system for all hazards. The ICS was also adopted by the federal land management agencies as the standard for response to all wild land fires nationally. A national, generic version of ICS is now in place.

2) The Multi-Agency Coordination System (MACS), as it applies to SEMS, is actually inter-agency coordination, and means the participation of agencies and disciplines involved at any level of the SEMS organization. These agencies work together in a coordinated effort to facilitate decisions for overall emergency response, sharing critical resources, and prioritizing incidents.

3) The Master Mutual Aid Agreement was initially signed in California in 1950 and was an agreement among cities, counties, and the State to join together in a comprehensive program to provide voluntary services, personnel, and facilities when local resources were

inadequate to handle an emergency. The Master Mutual Aid Agreement now contains discipline-specific Mutual Aid Systems that function on a statewide basis.

4) Operational Areas (OA's) consist of the city, and all political subdivisions within the city area. The governing bodies of the city, and the political subdivisions within the city, may have organized and structured their individual Operational Areas. The Operational Area is responsible for the coordination of resources and information, and acts as a link in the system of communications and coordination between the State's Regional EOC (REOC), the County EOC, and the County EOC's of individual jurisdictions. Operations area management staff and mutual aid coordinators locate and mobilize resources requested by local government.

   Any emergency not specifically indicated below, would be assigned to a Mutual Aid Coordinator, as defined by the type of emergency and applicable State or Federal laws. Coordination of resources under Fire, Law Enforcement, and other systems with formal adopted Mutual Aid plans, will follow their respective systems, protocols, and procedures.

Law Enforcement	**Public Works**
Earthquake	Dam Failure
Civil Disturbance	Flood
Nuclear Power Plant Emergency	Storm
Terrorism	
Act of War	

Fire and Rescue	**Health Care**
Fire	Threat of Declared Epidemic
Oil Spills	
Hazardous Material Release	
Mass Casualty	

5) Operational Area Satellite Information System (OASIS) is a satellite-based communications system with a high frequency radio backup. OASIS provides the capability to rapidly transfer a wide variety of information between agencies using the system. In SEMS, OASIS can be viewed as both a communications network and an information dissemination system, linking (3) three of the (5) five emergency response levels (State, Region, and Operation Area). The informational processing component of OASIS contains fifteen (15) forms that provide a rapid and accurate means of transferring information between locations on the OASIS network.

As required by law under SEMS, the following elements have been incorporated into the Signal Hill Emergency Response Plan:

- Use of SEMS in all future emergencies.
- Use of the SEMS functions (Management, Operations, Planning/Intelligence, Logistics, and Finance/Administration).
- Management by objectives, action planning, modular organization, organizational unity and hierarchy of management, span of control, personal accountability common terminology, resource management, and integrated communications.
- The ICS shall be used at the field level by all responding units, and personnel.
- Arrangements for the provision of direction and control, including internal personnel notification/recall rosters and implementation methods. This should include a communication system to implement call-back of personnel assigned to the EOC, and other response teams.
- Specific emergency authorities that may be assumed by a designated successor during emergency situations and circumstances under which emergency authorities would be terminated.
- Designation and establishment of communication systems and dispatch centers to manage Signal Hill resources and response personnel, and maintain contact with the EOC during emergencies.
- Designation of a representative to report to the EOC, during an emergency, to advise the Policy Group and coordinate Signal Hill's response efforts with other responding entities.
- Reporting appropriate information as to casualties, evacuation status, damage sustained, radiation levels, chemical exposure, etc, to the EOC Staff during an emergency.
- Provide for support of clean-up and recovery operations during and after emergencies.
- Training of assigned response staff and volunteers to augment emergency function performance.

6.0 PHASES OF EMERGENCY MANAGEMENT

The four phases of emergency management employed before, during, and after an incident are identified as Preparedness, Response, Recovery, and Mitigation (as illustrated below).

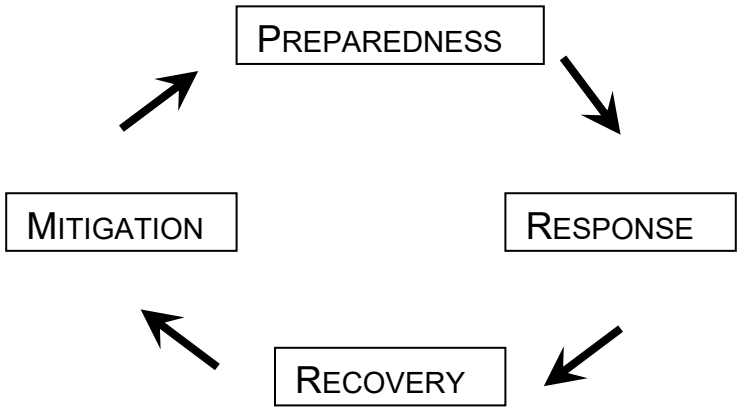

Figure 6-1: Four Phases of Emergency Management

NOTE: In emergency management and as used in this Emergency Response Plan, the term "mitigation" refers to the process of eliminating or reducing the effects of future emergencies and disasters. It is a phase within the overall concept of operations. However, within the hazardous materials discipline, the term "mitigation" is used within the response phase to mean the stopping or elimination of the cause of a release, or a reduction of the serious health and safety or environmental risks it poses; and within the recovery phase to refer to the process of cleaning up or restoring the environment to a safe or original (pre-release) state. (Source: California Hazardous Materials Incident Contingency Plan, draft August 1999)

6.1 Preparedness

Preparedness consists of activities undertaken in advance of an emergency. These activities are primarily designed to develop operational capabilities and improve response to hazardous materials incidents. For Signal Hill, most of these activities have the added benefit of being utilized as a key part of emergency and incident prevention (via inspections, permits, plan review and code/regulatory enforcement) as part of the Mitigation phase of emergency management.

Preparedness activities undertaken by Signal Hill include, but are not limited to, the following: emergency plans, mutual aid agreements, resource inventories, warning systems and procedures, emergency communications, training, drills and exercises, and response planning.

6.1.1 Pre-Incident Planning

The pre-incident planning period occurs before the emergency. Signal Hill and other response agencies are tasked with preparing for emergencies by conducting the following activities:

Hazard Analysis and Risk Assessment

Hazard analysis is the process of identifying the types of hazards that exist and their likelihood of occurrence. Risk assessment is the process of evaluating the degree of harm a hazard presents. Hazard analyses are conducted by Signal Hill to be utilized in developing emergency response plans and procedures, designing and modifying safety systems, identifying needed resources, conducting training and exercises, and minimizing damage and liability.

Plan Development and Implementation

Signal Hill may prepare supporting plans, standard operating procedures (SOPs), and checklists detailing personnel assignments, policies, notification rosters, and resources lists to support their emergency operations. Such plans and procedures will provide for coordination and communication among all entities responding to an emergency. Additionally, California H&SC Chapter 6.95 requires all businesses which handle hazardous materials over specified amounts to create a business emergency plan to be submitted to the local administering agency.

Integration with Regional, State and Federal Emergency Contingency Plans

This Emergency Response Plan has been developed to be consistent with regional and state emergency plans, including the Local Fire/Health Agency Hazardous Materials Area Plan, California OES LEPC Region I Emergency Plan, California State Emergency Plan and the California Hazardous Materials Incident Contingency Plan, and Federal plans such as the Federal Response Plan. Additionally, the Hazardous Materials Inventory and Business Emergency Plan is updated annually and submitted to the Administering Agency for their use in developing their Hazardous Materials Area Plan. This Plan is designed to interface with the Emergency Plan, and as such, is incorporated into this plan by reference. Wherever the Emergency Plan has more updated info, this plan is to be considered superseded. Lastly, this plan has been developed in coordination with the Local Emergency Planning Committee Region in order to meet requirements set out in the Public Health Security and Bioterrorism Response Act of 2002.

Training

Signal Hill must have personnel available who have been trained in emergency procedures. Signal Hill conducts regular training sessions to train personnel and generally familiarize people with the facilities and equipment available and the general layout of each facility.

In order to ensure that all employees understand and have received sufficient training in their duties during emergency situations, emergency response drills will be conducted. During these drills employees will conduct evacuation, staging, and notification procedures.

Following the drill, a meeting will be held to critique the emergency response procedures performed during the drill and to identify any portions of the procedures that should be modified in light of the information learned during the drill. The purpose of these exercises will be to continually reduce response times and to ensure that facility personnel are thoroughly familiar with the Emergency Response Plan and their responsibilities during emergency situations.

Individual members are trained in their appropriate tasks for an emergency through written documents, formal training, and on the job training. The level and type of training is dependent upon their specific roles, responsibilities, capabilities, and resources.

6.1.2 Planning Process

A carefully catalogued list of potential problems and emergency situations is basic to the development of and shall be included in each facility Emergency Action Plan. Some situations may seem remote and unlikely, but shall be considered along with more predictable events. Section 6.2 of this Appendix, “Response,” will include actions to be taken in the event of each of these considered situations. Additionally, an inventory of stream courses located in areas where hazardous materials could be spilled is essential to prepare for protection of these waters.

Continuity, Update, and Review

This plan is intended to be a working manual of continuing value. It is subject to constant review and updating by all facilities and by any other agencies which have an interest in this plan. Additional emergency equipment, newly discovered outside sources, special problem solving techniques, unusual experiences and preventive techniques are of extreme value in the process for updating this plan. This Plan shall be updated **annually** commencing from the date of publication of the first copy. Information of immediate value will be circulated when available, and included in the annual update.

6.1.3 Mutual Aid

There is a philosophical understanding between the local water agencies that in an emergency, they will assist each other through the exchange of materials, supplies, personnel, and water through emergency interconnections. While no formal agreements have been put into place to provide for these transactions, numerous discussions have been held with personnel from neighboring agencies to discuss implementation at the practical level.

6.2 Response

The response phase consists of the immediate response to an emergency to minimize its effects on public health, property, and the environment. It includes measures such as notification, implementation of emergency plans, activation of emergency operation centers (EOCs), mobilization of resources, issuance of warnings and directions, provision of medical and social services assistance, and proclamations of emergencies or disasters as enabled by appropriate legislation.

The response phase is broken down into four sub-phases. They are: discovery and notification; assessment and emergency response; containment, recovery and remedial actions; with the final sub-phase of documentation, cost recovery, and closure.

6.2.1 Discovery and Notification

When a Signal Hill employee discovers a situation which could be an emergency, that individual will contact the Signal Hill dispatcher immediately to provide information and receive instructions. The employee and the dispatcher will use the Emergency Response Action Guide in the “Quick Reference” Section to determine the appropriate level of response and notify the appropriate supervisor. The on-site employee will become the **Incident Commander** until relieved by proper authority.

Signal Hill has an emergency notification procedure and maintains an emergency notification list as part of this Emergency Response Plan. For the emergency notification list, see Quick Reference and Appendix A.

Additionally, if there is a release or potential release of hazardous materials, the dispatcher and the employee will contact the EOC Director immediately so the EOC Director can use the “Release Reporting Summary” matrices to ensure that the proper agencies are notified.

6.2.2 Assessment and Emergency Response

The Incident Commander (i.e., the employee who discovers the incident and has assumed command) will assess the situation and determine if the event is a controllable event or an emergency event. Signal Hill maintains (in various degrees), properly trained and equipped personnel to respond to emergencies. The response personnel and equipment may be available from inside Signal Hill and by contract with outside sources. In all cases, in the following steps, personnel responding to the emergency will use the Emergency Response Action Guide.

Controllable Event

If the event is a controllable event (line break, small fire, normal process failure), then the employee will take the appropriate actions as listed in the "Incidents" subsection of this plan.

Emergency Event

If the event is an emergency event (events requiring Hazmat or non-Hazmat response), then the employee will notify the Operations Section Chief and get further instructions on how to proceed.

The Operations Section Chief will call the EOC Director who will determine if the Emergency Operations Center (EOC) needs to be activated. The Operations Section Chief will contact the EOC Officers who will be impacted or whose resources will be needed during the emergency and make them aware of the status.

The Operations Section Chief will:

- Designate an Incident Commander (IC) who will report to the emergency site and be responsible for coordinating positive action. The IC will be responsible for all personnel, equipment and operations at the problem location. This individual shall be responsible for directing all activities.
- Make radio contact with maintenance and other personnel who are needed at the emergency site.

Activation of EOC

If the EOC does need to be activated (i.e., a disaster type emergency), then the following steps will occur:

- Management will set up the Emergency Operations Center (EOC) at the City of Signal Hill, Public Works Department at 2175 E. 28th St., Signal Hill, California, 90755 to direct Signal Hill personnel and coordinate with State and local officials.

- Employees are to evacuate buildings as warranted or if so advised and assemble at a common designated site, keeping a safe distance from buildings that appear to have sustained structural damage. Employees may then be directed to report for assignments. If supervisory personnel are not available, employees should report to the EOC at the City of Signal Hill, Public Works Department at 2175 E. 28th St., Signal Hill, California, 90755 or another specified location.

- If an employee is working in an area not directly involved in the disaster he/she should continue with his routine assignments until contacted by his/her supervisor. Employees will have been instructed to not use the phone unless absolutely necessary as lines must be available for emergency service.

- Employees have been instructed not to go home during an emergency without checking with the appropriate supervisor.

- Employees have been instructed not to take a radio vehicle home during an emergency without approval from the appropriate supervisor.

Emergencies During Non-Working Hours

- Once the employee is satisfied as to the well being of his/her family and home, he/she shall report to the EOC located at the City of Signal Hill, Public Works Department at 2175 E. 28th St., Signal Hill, California, 90755 or another specified location for assignments.

- Employees are to remain at the specified location until they receive assignments by the EOC Director or other authorized personnel.

Response During Scheduled Leave

All vacations, days off, executive leave, leaves of absence and other such scheduled leave days may be cancelled by the EOC Director or other authorized management personnel. Upon notice of such leave cancellation, employees shall report to their designated response area.

6.2.3 Plan of Operation

The following text provides a brief overview of the plan of operation for Signal Hill. This information includes Signal Hill responsibilities, assignment of the responsibilities and external communications (media).

Signal Hill Responsibility to Provide Service

In the case of an emergency, Signal Hill's prime considerations are:

- To protect life and property;
- To prevent unnecessary loss or contamination of stored treated water;
- To develop and maintain adequate amounts of potable water;
- To restore the entire system as soon as possible;
- To inform the public periodically of the status of the emergency action being taken and of the availability of potable water.

Apparent demand on the system for water will be extremely high until broken mains and transmission lines can be valved off and stored, and treated water contained. Mobility may be a major problem associated with trying to get the system under control. Community water supply may not be available for fire fighting due to broken mains.

Under these circumstances, restoration of conventional systems may take weeks to accomplish and it is necessary to focus on distribution points of potable water first. Rationing will be required and demand may be limited to as low as 10 gallons per capita, per day, during the initial restoration period.

Article 31026 of the Water Code of the State of California gives Signal Hill the power to restrict use of water for other than household and medical use during an emergency. To preserve water in times of disaster, Signal Hill will ration water in two general areas. The first area is the rationing of water to the individual consumer. Dependent upon the shortage of water, public announcements will be made to:

- Use no water for irrigation;
- Use water for in-house use only;

- Use water for cooking and drinking only.

Hospitals or businesses providing a critical service will be rationed water as needed and available. Those providing a non-critical service may have to discontinue use of water.

The second area of water rationing is more severe and applies to distribution of water when water is not available in portions of the distribution system because of contamination or destruction of facilities. Water may be supplied to these areas by tank trucks, which are commercially available, and/or other methods may be considered. Work crews have the tremendous jobs of constructing temporary lines and later preparing and disinfecting regular mains. This work, however, can be scheduled and supplies brought in as needed. There may be problems with cross connections, in the sense of ruptured sewer lines and water mains in proximity, and these must be considered when remedial measures are taken to correct the problem of ruptured lines and decontamination.

Assignment of Responsibility-Organization Control

It is the intention of Signal Hill to respond to any emergency with the proper amount of resources necessary to address the problem. In order to accomplish this task, Signal Hill has developed a tiered activation procedure. At the beginning of the incident, the initial discoverer of the problem will make a determination whether additional resources are necessary. If they are necessary, then that person will assume command of the incident until relieved by proper authority and will attempt to correct the problem. When they are relieved, the new Incident Commander will take charge of the scene and determine if still additional resources are required. At each level, the Incident Commander will make the decision whether to activate further up the chain of command, and will, at all times, keep the next level in the chain of command informed of the status of the situation.

Signal Hill employees have been trained to know when the level of response has exceeded their authority and capabilities and when to activate the next level of response. Additionally, the Emergency Response Action Guide in the “Quick Reference” of this document provides guidance to Signal Hill employees at each decision level for determination of proper resources and span of control.

Ultimately, the EOC Director or designee is responsible for emergency response to an incident and will assume command of Signal Hill’s Emergency Operations Center (EOC) or serve as the liaison to the Incident Commander if the Incident Commander belongs to another response organization. Should Signal Hill be the lead organization, the EOC Director or designee will be

responsible for appointing Signal Hill personnel for the SEMS positions as defined in Appendix B, “ICS Positions.”

Local Civil Defense Responsibility

In the event of a war-caused disaster, sabotage or radioactive fallout, earthquake or other emergencies, local emergency service officials will assume responsibility for directing and coordinating emergency relief efforts. Signal Hill will be expected to continue to provide water. Signal Hill will maintain a coordinator to liaison with the City during emergencies at the City EOC. This coordinator will be appointed by the EOC Director or designee.

6.3 Recovery

The recovery phase restores the area impacted by the emergency (i.e., earthquake, hazardous material release, etc.) to its pre-emergency condition, and includes measures such as: physical restoration and reconstruction; cleaning up of contaminated areas; debris removal; treating contaminated ground and surface water; providing health and safety information and eliminating and/or reducing any known hazards. Recovery operations include both short term and long term activities.

Short term recovery activities include removing spilled materials and contaminated debris/waste from the incident scene and coordinating its disposal, performing incident debriefings and critiques, initiating cost recovery activities, and performing necessary enforcement actions. Long term recovery actions include additional/longer term cost recovery activities, post-event damage assessments, hazard mitigation and prevention actions, and updating of response plans based on the lessons learned.

While many incidents can be terminated shortly after the response phase, some incidents require a recovery phase, which for major incidents may entail a considerable expense and time to return the area to a pre-incident condition. The transition from the response phase to the recovery phase occurs when the acute adverse aspects of the incident are eliminated. Site safety and security activities, however, will still continue throughout the recovery phase, as appropriate and as determined by the EOC Director. During this transition, response personnel and equipment may be demobilized if their use is no longer needed in the recovery phase.

6.3.1 Restoration Priority

In the event that multiple Signal Hill Water Facilities are damaged or are unable to continue functioning, employees will attempt to restore them in the following order. The following order also represents the order in which to maintain facilities in the event that they must be brought offline to conserve resources.

- Well #7 and Well #8
- MWD Interties
- Gundry Reservoir Treatment Plant and Pumping Station
- Temple Reservoir and Pumping Station
- Hilltop Reservoir and Pumping Station

6.3.2 Post-Emergency Procedures

Procedures for concluding an emergency response to an emergency include:

- Debriefing and demobilizing emergency responders;
- Transferring command responsibility from the on scene commander to the post-emergency authority (note that Signal Hill may be the post-emergency authority in incidents where the Incident Commander is another agency such as fire or law enforcement);
- Removal and proper disposal of spilled hazardous material/wastes;
- Completing necessary documentation and after-action reports;
- Investigation;
- Participation in the post incident review and critique; and
- Cost recovery.

6.3.3 Post-Incident Field Debrief of Responders

The Signal Hill EOC Director is responsible for ensuring that personnel involved with controlling emergencies are provided with debriefing information. The EOC Director will conduct a rapid debriefing in the field before resources are demobilized. The debriefing should address the following areas:

- Determination of exposures to personnel and equipment;
- Analysis of possible signs and symptoms from exposures and identification of appropriate actions if conditions present themselves;
- Recognition of psychological stresses from potential exposures to hazards and arrangement of further follow up;

- Collection of all pertinent information relating to the nature of the emergency, and of all emergency actions and operations that transpired in achieving stabilization;
- Completion of further scene mitigation actions and general activities necessary to ensure that cleanup is finalized safely;
- Identification of persons responsible for documentation of exposure reports, emergency reports, post-emergency analysis and critique summary reports; and
- Recognition of hazards faced and lessons learned.

6.3.4 Emergency Response Transition to Post-Emergency (Recovery Phase)

Post-emergency (recovery) refers to the portion of hazardous materials response performed after the immediate threat of a release has been stabilized or eliminated. These activities include clean-up of the site, removal and handling of hazardous waste, site perimeter security, investigation, and enforcement.

Responsibility during Post-Emergency

Signal Hill's responsibility at an incident is limited primarily to support of Emergency Responders for most incidents. Additionally, Signal Hill may be responsible for post incident cleanup if the incident damages or contaminates Signal Hill property.

Signal Hill will attempt financial recovery of any funds outlaid during the emergency through the responsible party, if the responsible party is other than Signal Hill. Additionally, Signal Hill will attempt cost recovery through Federal, State or Local disaster or planning grants, if applicable.

If the incident involves a hazardous material, a local emergency response organization may clean up the incident in order to prevent further potential harm to people, property or the environment. In this situation, the Finance and Administration Section Officer will task Signal Hill personnel to work together with the local response organizations to ensure that their cost recovery efforts go smoothly and, if required to assist in determining a responsible party for cost recovery. Refer to Appendix C, "Forms," for emergency finance tracking forms.

Transfer of Incident Command Responsibility

Signal Hill will transfer Incident Command Responsibility to the Responsible Party (RP), if that party is assuming responsibility for clean up. The transfer will take place when all emergency operations have been completed and the EOC Director determines that there is no further need for emergency response personnel.

Once command has been transferred to the RP, Signal Hill will maintain communication with the RP to ensure that the clean up is sufficient, meets Signal Hill requirements, and to provide any guidance and instruction which the RP requires.

If Signal Hill is the RP, or is assuming command of the recovery portion of the event, then Signal Hill will not assume command from the Emergency Response Agency (i.e., Fire Department, Police Department, etc.). The EOC Director will determine if there is no further need for emergency response personnel.

Post-Emergency Unified Command Involvement

As outlined in the California Hazardous Materials Incident Contingency Plan, the responsible agency for post-emergency Incident Command is typically determined by governmental agency authority at the location of the incident. As stated above, Signal Hill may assume 'lead agency' authority in the recovery phase depending upon the nature of the incident. Due to local, regional, state, or federal legal jurisdictional authorities, other governmental agencies may also have specific or general responsibilities and authorities in this phase. All agencies with such authority or responsibility will participate in the decision-making process as part of a Unified Command structure.

For example, the lead agency responsible for specific public lands must be involved due to the potential for financial responsibility when the responsible party is not known or their mitigation efforts are inadequate (e.g. CALTRANS and CHP responsible for freeways, state bridges and highways). As a general rule, Signal Hill will always be involved in the incident's post-emergency Unified Command to assist the responsible agency with determination of the appropriate extent of mitigation and proper waste handling. The government agency assigned the post-emergency Incident Command responsibility is generally based on whether the incident was on private or public land.

6.3.5 Hazardous Waste Removal and Disposal

In the event that the emergency involves hazardous materials, Signal Hill will not perform the final, post-emergency mitigation clean-up or provide waste removal personnel for Hazardous Waste. All removal activities will be performed via hazardous waste disposal contractor. A list of contractors is included in Appendix A, "Emergency Reference Information."

Responsible Party (RP) Responsibility

The Responsible Party (RP) for clean-up of a hazardous materials release is generally the person, corporation, business, or partnership in possession of the hazardous material when released; when the person responsible for the spill cannot be located or does not have the financial capability for spill mitigation, the property owner may also become the RP. The RP should be consulted in decisions that impact the recovery or mitigation of released hazardous materials. The incident command structure may include landowners and business owners, or their representatives, who are involved in the release or threatened release.

The RP is a legally recognized entity that has financial accountability and liability for actions necessary to abate or mitigate adverse environmental, human health, and human safety impacts resulting from a non-permitted release or discharge of hazardous material. The RP should be given an opportunity to abate the incident using resources at their disposal, but not to the detriment of the overall operation.

If the RP is unable or unwilling to provide acceptable abatement and mitigation of the incident, or if the RP is not known, Signal Hill may seek state or federal funding assistance. Public agencies may also provide personnel or funding for clean-up operations and later attempt to recover costs from the RP. Adequate clean-up response by the RP may be measured by the following questions:

- Can the incident be abated adequately and in a reasonable amount of time?
- Is the RP's clean-up contractor able and legally allowed to perform the required tasks?
- Can the RP properly dispose of the waste?
- Will delay in appropriate clean-up operations impact the adjacent area?
- Additional requirements apply when seeking state or federal financial assistance.

EPA Hazardous Waste Generator (EPA ID) Number

All hazardous waste transported from the scene of an incident requires an EPA hazardous waste generator (EPA ID) number to identify the origination of the waste. When the RP for the release has an EPA ID number, this number must be on the hazardous waste manifest or shipping paper prior to transportation from the scene. For transportation of waste where the RP can not be located or does not have an EPA ID number, a public agency may use the EPA ID number issued for emergency use. EPA hazardous waste generator numbers are issued by the Cal-EPA.

Disposal Facilities and Emergency Response Contractors

The Fire Department is the lead local agency for ensuring proper hazardous waste management during the recovery phase. The Fire Department HazMat Team will perform the hazardous materials release stabilization, and coordinate final removal with the Fire Department. The Fire Department may provide a list of hazardous waste clean-up contractors to the RP, in order to expedite scene recovery. Additionally, Signal Hill maintains a list of contractors who may perform these services. Signal Hill or the Fire Department may not, however, recommend to the RP the use of a particular contractor or disposal facility. A list of contractors is included in Appendix A, "Emergency Reference Information."

6.3.6 Non-Hazardous Waste Removal and Disposal

Since the emergency does not involve hazardous materials, Signal Hill may perform the final, post-emergency mitigation clean-up. Some removal activities will be performed via contractors. A list of contractors is included in Appendix A, "Emergency Reference Information."

Responsible Party (RP) Responsibility

The RP for clean-up of a non-hazardous materials incident will be the person, corporation, business, or partnership who caused the incident. In the event that an RP cannot be identified, the property owner may become the RP. The RP should still be consulted for operations which may involve clean up and, in the event that the Signal Hill is the RP, Signal Hill will provide a representative to interface with the Incident Commander to ensure that the Signal Hill's interests are represented.

6.3.7 Follow-up Reporting Requirement to Legislature

Section 8607.2(b) of the CA Government Code requires that an agency which serves over 10,000 connections makes a follow-up status report to the Legislature within 6 months following the declaration of a state of emergency. The EOC Director, or designee, will be responsible for making this report by filling out the "Follow-up Status Report" in Appendix C within 6 months after any major incident.

6.4 Mitigation

Reducing the risk to people, property, and the environment is the basic goal of emergency management. Mitigation, therefore, is considered the principal foundation of emergency management because it helps reduce the number of victims, property loss, and environmental damage. The mitigation phase is the ongoing effort - at federal, state, local, and individual

levels - to prevent or lessen future emergency or disaster incidents and the impacts they have on people, property, and the environment.

Examples of mitigation activities would include the following:

- Legislation, laws and regulations;
- Variances;
- Zoning and land use management;
- Engineering and building codes;
- Compliance;
- Hazard mitigation plans & teams;
- Technical guidance & assistance;
- Financial assistance;
- Hazard Identification;
- Risk Analysis;
- Evaluation;
- Research; and
- Education.

Mitigation should be viewed as the means to decrease demands for emergency response resources; it reduces the principal causes of injuries and deaths; it enables a quicker lifesaving response and economic recovery because the community infrastructure remains intact; and it reduces the societal impacts of the emergency because it results in less disruption to the social environment. In essence, mitigation is the foundation of sustainable community development.

Mitigation is the method by which the information gathered from experience, exercises and suggestions is “folded” back into the plan to improve response and prevent additional mishaps in the future, with the ultimate goal of preserving life, health, property, and the environment.

6.4.1 Debrief

The post-incident field debrief held by the EOC Director prior to turnover for the recovery phase should include an evaluation of the SEMS framework and its implementation in this plan and be provided to the EOC Director, or designee, to be used as part of a larger, overall debrief of the incident. The formal debrief should be scheduled within 2 weeks of an incident or exercise and should be held with the intention of improving the Emergency Response Plan. The EOC Director should hold the debrief meeting and should address all of the four phases of the Emergency Response Plan. A Debrief Form has been included in Appendix C, “Forms,” to serve as a guide for ensuring that the information is comprehensive. The EOC Director will retain copies of all debriefs and ensure that they are reviewed and lessons learned are incorporated during the next revision of the Emergency Response Plan.

6.4.2 Best Practices

The Operations Section Chief follows industry news in order to better understand the industry practices for Emergency Response Procedures. The Operations Section Chief is responsible

for maintaining a file of improvement suggestions which will be reviewed and incorporated as appropriate during the next revision of the Emergency Response Plan.

6.4.3 Field Suggestions

As suggestions come in from field personnel on appropriate topics, the Operations Section Chief and the EOC Director are responsible for reviewing and incorporating them as appropriate during the next revision of the Emergency Response Plan.

6.4.4 Updates

This plan will be reviewed at least annually and updated as appropriate. The Operations Section Chief and EOC Director are responsible for ensuring that all debriefs, best practices and field suggestions are addressed during the review, and incorporated into the correct sections as appropriate. Additionally, during the update, the Coordination Letter will be sent to the appropriate agencies by the Operations Section Chief. A copy will be kept in Appendix J, "Supporting Documentation," along with any responses. Information from the responses will be incorporated into the correct sections as appropriate.

When an update has been completed, an electronic copy of the ERP will be sent to the California Department of Public Health. A copy of the certification letter will be kept immediately behind the Table of Contents along with CDHS' response stating that the plan has been approved.

7.0 RESPONSE LEVELS

Signal Hill's primary objective and initial response to an emergency will be to determine the level of mobilization necessary to save lives, maintain personnel and public safety, and to protect the environment and property. Initially, preliminary inspection of Signal Hill facilities after an emergency will dictate the level of mobilization that is required. Mobilization levels have been defined in Table 7-1, " Levels of Alert and Emergency Response Activation".

Table 7-1: LEVELS OF ALERT AND EMERGENCY RESPONSE ACTIVATION

EVENT/SITUATION	LEVEL of ALERT	NOTIFICATIONS AND STAFFING
Normal Daily Operations: ▪ Typical problems and occurrences such as small localized power failures ▪ No immediate threat to public or employee safety	**ONE** **1**	▪ Standard on-duty staffing levels ▪ Personnel response to problems and incidents around the clock
Moderate: ▪ Earthquake (3.5 - 5.0) - within the service area ▪ Severe storm likely to impact the area ▪ Likelihood of major flooding ▪ Power outage of significance with multiple facilities involved and/or member agencies impacted ▪ Destructive winds ▪ Wildfire impacting operations ▪ Hazardous material spill or release ▪ Water quality or regulatory concern ▪ Pending situation with serious consequences ▪ Water demands likely to exceed available supply or capacity	**TWO** **2**	**Working Hours***:* ▪ The EOC Director is notified by the Operations Section Chief of Alert Status 2 and informed of the situation ▪ EOC may be activated and staffed by available personnel as listed in Appendix B **After Hours:** ▪ The EOC Director is notified by the Operations Section Chief of Alert Status 2 via telephone or the emergency radios ▪ Additional staff are called to respond as needed ▪ EOC may be activated and staffed by available personnel as listed in Appendix B
Significant: ▪ Earthquake (5.0 – 5.5) within or close to the service area ▪ Multiple/Severe storm related problems ▪ Flooding with significant operations impact ▪ Major power outage of unknown duration ▪ Substantial water system incidents involving numerous outages, facility damage, regulatory and/or public health and safety concerns ▪ Civil disorder	**THREE** **3**	**Working Hours:** ▪ Operations section of the EOC is to be activated ▪ The EOC Director is notified by the Operations Section Chief of Alert Status 3 and informed of the situation ▪ The entire EOC may be activated and staffed by available personnel as listed in Appendix B **After Hours:** ▪ Operations section of the EOC is to be activated. ▪ The EOC Director is notified by the Operations Section Chief r of Alert Status 3 via telephone or the emergency radios ▪ Additional staff are called to respond as needed ▪ The entire EOC may be activated and staffed by available personnel as listed in Appendix B
Major/Catastrophic: ▪ Large Earthquake (>5.5) within or close to the service area ▪ Severe flooding ▪ Long-term power outage ▪ Chemical, Biological, Radiological contamination	**FOUR** **4**	**Working Hours:** ▪ EOC is to be fully activated **After Hours:** ▪ EOC is to be fully activated. All personnel are to report to duty after securing their family situation. Employees should anticipate responding for an extended period of time.

Level 1

On-duty employees will report as directed. Off-duty employees will not report unless contacted by their supervisor.

Level 2

For **Level 2** emergencies that occur during **regular working hours**, pre-assigned response personnel will immediately proceed to their designated locations to perform emergency assignments. Facility inspection will begin with the first responders assembling in designated areas. Other emergency personnel will be activated and dispatched as necessary. When inspections have been completed, damage reports will be communicated to the respective Planning Section Chief. At that time, the Planning Section Chief or his/her alternate, may request that additional personnel be mobilized to areas of reported damage. The Planning Section Chief will be responsible for reporting each section's findings to the EOC Director. Depending on the extent and severity of damages that are reported, the EOC Director *may* decide to activate the Signal Hill Emergency Operations Center (EOC).

For **Level 2** emergencies that occur during **non-regular working hours**, inspectors and other pre-designated emergency field personnel will respond immediately to their designated locations. In the event of an isolated system failure or other damage requiring immediate attention, the involved field personnel shall notify the Planning Section Chief, who in turn shall report the field's finding to the **EOC Director**. Staff shall then proceed to contact the appropriate level of management and determine the necessary changes to system operations. Depending on the extent of the localized damages, the EOC may be activated to monitor the progress of isolated incidents.

The EOC is located in the City of Signal Hill, Public Works Department at 2175 E. 28th St., Signal Hill, California, 90755. It contains communications equipment, including radios, essential telephone lines, and an emergency frequency scanner. The EOC also has copies of the Signal Hill Emergency Response Plan, Operations Manuals, distribution system maps, and various telephone directories.

Level 3

If a **Level 3** emergency occurs during **regular working hours**, personnel assigned to the Signal Hill EOC are required to report to the EOC for emergency duty. Emergency field personnel that have been designated as emergency response inspectors for specific facilities for each section

will immediately report to their assigned locations. Other emergency personnel will receive instructions from the EOC as deemed appropriate by the EOC Director.

For a **Level 3** emergency during **non-regular working hours**, all personnel designated to the EOC are expected to report for emergency duty. Appropriate emergency field personnel will immediately report to their assigned locations. Other emergency personnel are expected to respond according to their specific assignments.

Level 4

A **Level 4** emergency requires full mobilization of all employees and resources. During a Level 4 emergency, all emergency response efforts will be coordinated through the EOC, under the direction of the EOC Director. In the event of a catastrophic emergency which affects all or a majority of its service area, manpower, equipment, and materials from outside agencies and organizations would be required.

During certain types of emergencies, telephones may become inoperable for at least a short period of time. Therefore, initial telephone communication may be limited. If telephone service is maintained, telephones should be used only for urgent calls, since lines will likely become tied-up due to the increased volume of calls following an emergency.

During the first hours or days of an incident, employees and their families may have little or no contact with each other. This may be caused by the incident itself or because employees and/or family members may be responding to the incident. The Public Information Officer will be responsible for the development of information to be given to employees' families, as well as taking and distributing messages from employees' families.

8.0 RESPONSE PHASES

Phase I **Preliminary Inspection**: Rapid inspections are conducted to determine injuries and any damage that might affect the distribution system.

Phase II **Report Back and Follow-up Structural Engineering Evaluation**: Emergency communication flow is initiated by the EOC. Additional and more thorough inspection procedures are conducted. Designated facility personnel are mobilized, as necessary.

Phase III **Repair:** Field personnel are coordinated to conduct repair of damaged facilities.

Phase IV **Management Activation**: EOC Director and EOC Officers report to the EOC to assume and coordinate emergency responsibilities.

Phase V **Full Mobilization**: All available employees are mobilized and outside assistance may be requested.

Unless otherwise noted, the following assignments are valid for both on- and off-duty emergencies.

8.1 Phase I: Initial Inspection

Refer to the Exhibit QR-1: Employee First Response Duties located in the Quick Response Section

Communications

Radio

Signal Hill has access to hand-held and truck mounted radios.

> *During the emergency, radio communication shall be strictly controlled by the EOC and the Incident Commander. Radio use shall be restricted to essential communications only. Non-essential use of radio communications shall be eliminated.*

Messages and reports shall be kept concise and clear to avoid misunderstandings. To ensure that the information reported by inspection and patrol personnel is fully understood and comprehensible, all messages and reports should be repeated and verified.

Telephone

Signal Hill has a standard telephone system, which will be operational from the EOC. The service is on priority status with the local telephone provider. However, large-scale events and incidents that damage local phone lines can cause an interruption of service. In the event the telephone service is interrupted, cellular telephones will be used as a backup. If employees cannot communicate on the telephone, they are to automatically report to work, unless otherwise notified.

Cellular

Signal Hill will have cellular telephone capabilities from the EOC. Cellular telephone service does not have priority service capabilities, and the system easily becomes overwhelmed during large-scale events and morning and evening commuter hours. The Signal Hill radio system is a backup to the cellular telephone system.

Paging

Signal Hill contracts paging services for key managers, supervisors, and operational staff. Paging services are a combination of radio and telephone systems, and are computer operated. These systems are highly vulnerable to service interruption and may not be reliable during large-scale events. If employees do not receive pager notifications and cannot communicate by telephone, they are to automatically report to work, unless otherwise notified.

8.2 Phase III: Repair

Maintenance and other personnel shall respond in the following manner:

- The damage inspectors shall review the situation and assess damage within their areas as deemed necessary and shall determine the personnel, equipment, and material necessary for emergency repair.
- During regular working hours, maintenance and repair crews shall be dispatched as required by radio communication. Crews shall not use radios except for emergency communication; they will be called as needed.
- Requests for local construction or maintenance crew shall be directed to the EOC.
- Personnel who have not been assigned emergency responsibilities shall report to their assigned work locations for regular working hours, unless otherwise instructed. Off-duty non-emergency personnel shall not telephone in; EOC Officers will notify these personnel if they are needed for the emergency.

8.3 Phase IV: Management Activation

Depending on the extent of damage to facilities, the EOC Director or designee will proceed to the EOC to coordinate emergency management efforts. The EOC will be activated for emergency response and recovery operations.

City Council

The Directors provide support to the EOC Director and Signal Hill's Emergency Operations Center (EOC) with official City Council actions, liaison to other government agencies, and representation to the communities, as requested.

Director of Emergency Operations Center (EOC)

The EOC Director activates the Emergency Operations Center (EOC), activates the Signal Hill Emergency Management Response Plan, ensures official notifications are made, provides overall direction for the emergency response, determines strategic priorities, maintains coordination with the City of Signal Hill Operational Area and other officials, and provides overall direction for the recovery process.

Public Information Officer

The Public Information Officer collects and disseminates information to employees, the public, and the news media; establishes and manages the Information/Media Center; prepares emergency instructions for the public; coordinates releases with other agencies; arranges and conducts news conferences; serves as the official Signal Hill spokesperson when designated; and implements rumor control procedures.

Liaison and Mutual Aid

The Liaison manages and tracks all requests for mutual aid and handles all logistics for Signal Hill mutual aid teams sent to other agencies. During response to requests for mutual aid for other agencies, this may be the only position activated. If the District's EOC is not activated, the Liaison may be directed to report directly to other agency EOC's.

General Counsel

The General Counsel provides professional services to the EOC Director regarding emergency actions, Signal Hill liabilities, legal procedures, and possible legal eventualities (particularly in situations involving damage or injury to others). Also assists the Board members with advice regarding Board procedures and issues.

Operations Section Chief

The Operations Section Chief is responsible for determining the Signal Hill capability for service, assigning field incident commanders in multiagency incidents, and coordinating and directing the cleanup and repair efforts in operations facilities after the emergency response phase is ended.

Planning Section Chief

The Planning Section Chief is responsible for the management of all information regarding situation status, planning for ongoing operations, engineering safety and damage inspections, damage assessment, recovery aspects of Signal Hill facilities, and services and emergency project management. This position plans for ongoing operations, according to the expected response duration and extent; verifies all information for accuracy and consistency; directs inspections and damage assessment for the district; surveys all structures, posting and restricting entrance as appropriate; and initiates and manages emergency projects. This position also assists with required documentation for the recovery phase and develops the after-action report based on input from others.

Resources and Logistics Section Chief

The Resources and Logistics Section Chief manages the procurement, distribution, delivery, and accounting for resources requested by the Operations and Planning and Intelligence Sections. This position ensures that information is kept regarding the status of all Signal Hill personnel and families, members of the public, and contractors on District property; provides for all requirements for personnel support, including field and EOC personnel; handles personnel matters and related issues. The Resources and Logistics Section Chief also supports the accurate accounting for purchases and contracts, as required for Signal Hill business and FEMA/OES documentation.

Finance and Administration Section Officer

The Finance and Administration Section Officer directs and manages the accounting system for the emergency, tracks emergency expenses, and prepares FEMA/OES documentation files for each major site.

8.4 Phase V: Full Mobilization

In the event of Level 2 or 3 emergencies, the EOC Director will coordinate efforts in the recovery of normal operations. Personnel subject to emergency response duties shall be those persons assigned as damage assessment team members, EOC, staff, or other emergency roles (refer to

the EOC Staffing Matrix in the Quick Reference). All personnel who are not assigned an emergency responsibility shall report to their regular assigned work locations, unless otherwise notified.

9.0 EMERGENCY OPERATIONS CENTER (EOC) ACTIVATION PROCEDURES

The Emergency Operations Center (EOC) is a location from which centralized emergency management can be performed. This section describes the importance of EOCs to a successful, well coordinated emergency response. The essential functions needed in an EOC are listed below:

- Personnel to fulfill the positions of EOC Director, Operations Section Chief, Planning Section Chief, Resources and Logistics Section Chief, Public Information Officer, and Finance and Administration Section Officer.
- Opportunity to set priorities and develop Action Plans.
- Coordinate all field level incident activities within the area.
- Gather, process and report information within the utility service area and to higher levels within SEMS.
- Coordination with Local Government, Operational Areas, or Regional EOCs, as appropriate.

Location:

Primary EOC – City of Signal Hill, Public Works Department, 2175 E. 28th St., Signal Hill, California, 90755

Communication Systems:

Personnel in the EOC must have adequate means of communication during an emergency. Backup communications must be provided for all critical communication links. These could include, but are not limited to, field units, adjacent utilities and the Operational Area EOC.

Communications systems will include some or all of the following:

- Commercial telephone
- Cellular telephones
- Base radio and radio frequency scanner set to fire, police, medical services frequencies, and the National Weather Service
- Pay telephones

Activation and Notification

Efficient emergency response begins with activation of the plan and notification of response personnel. Most disasters develop from normal emergency response situations which allow for some warning and notification. In such cases:

- The EOC Director will contact the available EOC Offices and request that they report to the City of Signal Hill, Public Works Department at 2175 E. 28th St., Signal Hill, California, 90755 and establish an Emergency Operations Center (EOC). Notification will be by telephone, oral delivered message, radio or paging equipment. After establishing the EOC, the City Council will determine if there is a quorum present and declare an emergency.

However, in situations such as a significant earthquake, the emergency is immediate and personnel should be trained to respond immediately, without waiting for notification. The following information outlines how activation of the plan and notification of personnel occurs.

- Automatic Activation - although rare in occurrence, certain disaster events would automatically activate the Emergency Response Plan. In the following conditions, staff are to respond to their emergency response site immediately:
  - Significant earthquake where no communication is possible (hand-held radio, telephone, cellular phone, etc.)
  - State of War emergency.
- Activation with Notification - In most events there is a build up or warning time which allows for the following activation procedures. The Emergency Response Plan may be activated by the EOC Director or designee in his/her absence) under several conditions:
  - A threatened or actual event which affects only the facilities and operations (i.e., supply contamination or moderate earthquake).
  - A local area emergency has the potential or has affected all or part of the service area (i.e., storm or fire).
  - A regional event (i.e., moderate earthquake) occurred and communications are still functional.

Notification Procedure - Once a disaster has occurred, personnel must be notified to respond. The purpose of this procedure is to facilitate the contact of employees to notify them of a

declared emergency, to provide instructions concerning reporting for work, and to ensure that they are notified uniformly. The Emergency Action Guide flow chart in the Quick Reference establishes the mechanism for contacting each employee.

As notifications are made, the following actions should occur:

- Records of messages sent and directives given should be preserved.
- Radio communications should be limited to vital messages only. Radio channels should remain clear until necessary for emergency messages to be sent. Messages should be sent by stating the call sign of the sender and then stating that it is an emergency message. All other transmitters should remain off the air unless requesting clearance to report life threatening situations.

Emergency Staffing - The level of response to a disaster or incident affecting Signal Hill may be dictated by the overall impact, rather than the type of an event. The scope of the disaster or incident, its associated hazards, and area(s) affected at the time the event occurs will determine the level of plan activation and associated response activities. The Standardized Emergency Management System (SEMS) is designed to expand and contract, as necessary, as an incident demands. While the functions within SEMS will remain the same, each function can be activated, expanded and contracted, and deactivated as the needs arise, are met, and are no longer needed.

Levels of Response - As discussed above, emergencies and disasters require various degrees of response. Not all situations necessitate an all out response by Signal Hill. The following paragraphs describe when a partial or full response is necessary and some of the activities which must be performed.

Partial Response - The initial response to an emergency involves not only activating the plan and recalling personnel, but doing so at the appropriate level.

- A particular warning or event has occurred, and an emergency may be declared.
- May involve an emergency where a limited number of responders can handle it, or it might involve the early stages of what could later become a larger problem.
- At the outset of an emergency or progressive disaster, only a few staff members may be involved. For example, only the EOC Director, Public Information Officer and Operations Section Chief would be needed for a small earthquake. But when a large earthquake hits, more staff are needed.

- Disaster response actions include briefing elected officials, sending information to the public through the media, and communicating with other involved agencies.

- Field disaster response actions include securing dangerous areas and damage inspections.

Full Response - during a full response, the EOC is opened, and all or most of the positions are filled. Full response involves a disaster that requires an all-out response effort, for example, a 7.0 earthquake.

Emergency Response Activities - When the EOC is activated, all identified staff are expected to report for duty during non-work time, or remain on duty and assume their identified emergency assignment. This includes 24-hour coverage and automatic response under certain conditions. As on-call Signal Hill staff respond, they are to determine the impact to employees and Signal Hill systems, begin to assess damages, identify who else is needed, and identify what outside agencies need to be contacted. Each person/department assigned to the emergency operations team will respond to the EOC to manage their own personnel and department resources, work with other staff to get outside resources, and begin operations to recover from the emergency.

Sustained Operations - A critical component in responding to a disaster is the ability to sustain operations for an extended period of time. Quite often, Signal Hill employees themselves may be victims, while also being expected to respond and perform disaster related duties. Many employees may be unable or unwilling to respond to work because of their personal situations. This may require Signal Hill to have an employee care program in place and/or request mutual aid to conduct ongoing emergency response activities.

Deactivation and Demobilization - The following procedures will be followed for deactivation of the EOC:

- No equipment or personnel should leave the incident until authorized by the EOC Director.
- EOC Officers and emergency responders will be thoroughly briefed prior to leaving the incident. The briefing will include methods of travel, destinations, estimated times of arrival, and transportation arrangements.

Standard Operating Procedures

- Check-In prior to assuming assignment
- Respond aggressively to the disaster but always consider safety in all actions taken
- Initiate all action based on current and expected situation
- Recognize current weather conditions and obtain forecasts
- Ensure instructions are given and understood
- Obtain current information on disaster status
- Remain in communications with crew members, your supervisor and adjoining forces
- Determine safety zones and escape routes
- Establish lookouts in potentially hazardous situations
- Retain control at all times
- Stay alert, keep calm, think clearly, act decisively
- Document all actions taken, listing personnel, vehicles and materials involved
- Demobilization upon completion of operation

10.0 EVALUATION

Based on information provided by the initial observer at the emergency site, the Incident Commander will make an evaluation prior to activation of the plan. When calling dispatch with notification of an emergency or imminent danger the following minimum information is required:

- Nature and type of emergency that has occurred.
- Location of emergency.
- Initial abatement and mitigation actions required.
- Safety equipment needed immediately for employee safety and public health protection.

The evaluation shall enable management and other personnel to plan and implement immediate and longer-term response actions to the affected area.

EMERGENCY CLASSIFICATION SYSTEM

10.1 Routine Problem Areas

Signal Hill personnel are involved in emergencies which, although serious, are controlled by standard procedures and do not require notification of civil authorities to control.

Some of these emergencies include:

a) Pipeline breaks
b) Blowouts of water lines
c) Minor chemical spills
d) Single total coliform violations of drinking water
e) Minor accidents requiring first aid
f) Short duration power failures
g) Variations in water quality such as high turbidity
h) Intermittent low pressure in isolated areas

These types of problems will not be discussed in this report.

10.2 Classification of Emergencies

Simply stated, a disaster is an event, natural or manmade, which causes a community or a specific area to suffer danger or disruption of normal functions.

An emergency situation as defined in this plan is a failure of a facility or a natural phenomenon which causes immediate destruction of property or threat to human life. An emergency situation

requires an immediate decision by the Incident Commander, and action by employees assigned to the area.

10.3 Examples of Emergencies Discussed in this Plan

10.3.1 Disasters

- Earthquakes
- Major fire
- Drowning or other deaths
- Release of Hazardous Materials
- Explosion
- Civil disorders, sabotage or bomb threat
- Nuclear attack/Act of War
- Major power outages to critical facilities or systems

10.3.2 Local Emergencies (Drinking Water Emergencies)

- Failures in one fecal coliform or multiple total coliform tests
- Oil Spills
- Toxic chemicals
- Radioactive fallout
- High coliform content
- Major Failure of Treated or Raw Water delivery systems

10.3.3 Effects on Signal Hill Operations

The above incidents may cause any of the following problems to operations:

- Curtailment of services
- Contamination of water supplies
- Rationing of water
- Personnel contamination
- Large scale loss of water
- Loss of power with coincident disruption of service
- Failure of pumping facilities
- Disruption of communications
- Interruption of maintenance and repair operations

An Incident is an event that can be safely and effectively controlled by employees at the facility, whereas an Emergency is an event that requires the immediate assistance of outside agencies. Although this ERP contains pre-planned action guides to address incidents, the main focus of

the document is to provide structure and guidance to employees to effectively respond and mitigate emergencies.

According to adopted State, Federal, and other governmental agencies' policies, a seismic emergency can be classified into one of three levels of severity: Minor (Level I), Major (Level II), Catastrophic (Level III). This rating system provides a universal standard for determining how and when to initiate an emergency response. These response levels can be utilized for all types of emergencies in addition to earthquakes, for which they were originally designed. These emergency activation levels are comparable to the activation levels set forth in Section 7.

In the case of earthquakes, the Richter and Modified Mercalli Intensity Scales will be utilized to further define the various levels of an emergency. Exhibit 2.6.A (in Section 2.6 of the Response Specific Tabs for Emergency Events Not Involving a Hazardous Material) provides a comparison of the two scales. For other emergencies, the level of severity will be determined in a subjective manner.

- LEVEL I - MINOR EMERGENCY: A minor to moderate incident wherein local resources are adequate and available - Examples:
  - local flooding
  - short-term power or communications failure over portions of Signal Hill service area
  - minor earthquakes (See Section 2.6 for additional details)

  Note: These events may result in Signal Hill Incident Command activation.
- LEVEL II - MAJOR EMERGENCY: A moderate to severe emergency wherein local resources are not adequate and mutual aid may be required on a regional or state-wide basis - Examples:
  - regional flooding
  - dam failure
  - power or communications failure throughout Signal Hill's service area
  - strong to very strong earthquakes

  Note: These events may require either Signal Hill or External Incident Command.
- LEVEL III - CATASTROPHIC EMERGENCY: A major disaster wherein resources in or near the impacted area are overwhelmed and extensive state and/or federal resources are required. Examples:
  - catastrophic earthquakes
  - major storms

  Note: These events are likely to require External Incident Command.

11.0 ACTION PLANS

Action Plans are an essential part of all SEMS levels. Action planning is an effective management tool involving both a process to identify objectives, priorities and assignments related to emergency response or recovery actions and plans, which document the priorities, objectives, tasks and personnel assignments associated with meeting the objectives. The primary responsibility for preparing action plans is assigned to the Planning and Intelligence Section. The EOC Director and all members of the General Staff must participate in the process and there must be adequate representation of key organizational components. Representatives must understand the action planning process and be willing to follow the process. There must also be adequate pre-event planning and participants must adhere to the format and timetables related to the planning process.

There are two kinds of action plans:

- Emergency Operations Center (EOC) Action Plans which focus on jurisdictional related issues.
- Incident Action Plans (IAPs) which are prepared in the field at the scene of the emergency and are focused toward how specific tasks will be accomplished.

EOC Action Plans - are required for each operational period, the length of which is determined by first establishing a set of objectives and priority actions that need to be performed and then establishing a reasonable time frame for accomplishing those actions. Generally, the actions requiring the longest time period will define the length of the operational period. Typically, operational periods at the beginning of an emergency are short. As the emergency progresses, operational periods may be longer, but should not exceed twenty-four hours. The initial EOC Action Plan may be a verbal plan developed in the first hour after EOC activation. It is usually completed by the EOC Director in concert with the EOC Officers. Once the EOC is fully activated, EOC Action Plans should be written. These plans should not be complex or be overly time consuming.

Incident Action Plans - are also required for each operational period and may be either verbal or written. Written plans are recommended to provide guidance for multi-agency/multi-jurisdictional incidents, complex incidents and long term incidents where operational periods would extend across shift changes.

Action plans are based on establishing priorities of actions to be undertaken. The following items illustrate the types of actions that should be a priority for Signal Hill:

- Act to protect life. If the disaster has created a severe water supply emergency that results in a threat to public health, follow the criteria established by the Department of Health Services, Office of Drinking Water for authorization to use alternative supplies. If the alternative supplies do not meet primary drinking water standards, issue a Boil Water Order or Unsafe Water Alert (See Appendix I, "Public Relations")

- Preserve water pressure to the extent possible.

- Isolate areas that will take the longest to restore to service and work with local government to provide alternate water supplies.

- Set priorities on repair work. Plan to restore service area by area. Get input from the Emergency Operations Center on essential uses. Keep in mind the need for firefighting water.

The following guidelines will be followed for activities for initial response, sustained operations and deactivation:

Initial Activities:

- Activate the appropriate level of the emergency plan.
- Mobilize emergency response personnel, as needed.
- Activate the Emergency Operations Center, if needed.
- Activate the Incident Command System (ICS), if needed.
- Activate damage assessment teams.
- Evaluate safety of facilities.
- Begin documentation process, including photos and video recording.
- Activate emergency communications systems, as needed, and report damage through the SEMS organizational process.
- Activate emergency response measures when necessary, such as:

    Contracts for emergency supplies and equipment

    Obtaining support supplies for recovery personnel

    Emergency time-keeping methods to record employee hours worked

    Inter-agency coordination of resources

    Develop repair and restoration plans

Within 24 Hours:

- Staff the Emergency Operations Center 24-hours a day, in 8-12 hour shifts.
- Within 8 hours, complete a preliminary damage inspection
- Identify alternatives for providing temporary services, if necessary, pending full restoration.
- Set up financial object codes to capture FEMA cost allowance information.
- Issue water quality advisories as required by the State Department of Health Services, Office of Drinking Water.
- Establish restoration priorities and initiate emergency repairs.
- Make external notifications to local governments, regulatory agencies, essential suppliers, major customers, and others as indicated.
- Request mutual aid resources as warranted by the situation.
- Provide public and employee information announcements as indicated.

Within 72 Hours (Sustained Operations):

- Update restoration priorities.
- Reassess the need to make, modify, or rescind water quality advisories.
- Review finances and make adjustments if necessary to meet priority response and recovery needs.
- In conjunction with other local agencies, initiate requests for state and federal disaster assistance as warranted.
- Continue damage inspection, emergency repairs, public and employee information announcements, and liaison with external agencies.
- Review previous actions.

Deactivation:

- Authorize deactivation of field response or EOC sections when they are no longer required.
- Deactivate the EOC and close out logs when the emergency situation no longer requires activation.
- Notify adjacent facilities and other EOCs, as necessary, of planned time for deactivation.
- Ensure that any open actions will be completed after deactivation.
- Be prepared to provide input to the after action report.

12.0 REPORTING REQUIREMENTS

The 1994 Uniform Fire Code, Article 13, Section 1302.2, ("Reporting Emergencies"), states: "In the event a fire occurs or the discovery of a fire, smoke or unauthorized release of flammable or hazardous materials on any property occurs, the owner or occupant shall without delay report such condition to the fire department." This is one of the bases for notifying 911 Municipal Emergency Services as one of the first emergency response actions. This notification may also be one mechanism for ensuring that other parties are informed if the response to an incipient stage event can not be readily controlled.

The requirement for release reporting is also reinforced by CCR Title 19, Chapter 4, Article 2 ("Reporting Requirements"). Section 2703 ("Immediate Reporting of a Release or a Threatened Release") states:

(a) "A person shall provide an immediate, verbal report of any release or threatened release of a hazardous material to the administering agency and the Office of Emergency Services as soon as:

(1) a person has knowledge of the release or threatened release;

(2) notification can be provided without immediate control of the release or threatened release;

(3) notification can be provided without impeding immediate emergency medical measures."

The above regulatory requirements use terms such as "immediate reporting" and "without delay report". From a practical perspective, site events such as releases can fall into one of three general categories:

1) a clear potential for imminent on-site or off-site health or environmental impacts

2) potential on-site or off-site health or environmental impacts

3) very remote potential for on-site or off-site health or environmental impacts

It is clear that Category 1 requires immediate assistance and an immediate 911 call. Category 2 may require rapid size-up to characterize the likelihood of on-site or off-site health or environmental impacts. Category 3 may utilize a reporting mechanism authorized by the administering agency. When in doubt, there should be no hesitancy in summoning the appropriate emergency response agencies by using 911.

The following is offered as a practical protocol and is not intended to represent an agreement by any agency to contradict reporting requirements as defined by the Uniform Fire Code or the California Code of Regulations. It should be noted that this is simply intended to be a reflection of an operational understanding between Signal Hill and the appropriate municipal response authority.

Use 911 for immediate notification, as described above, unless all available information immediately identifies the release/fire to be small enough or sufficiently contained as to not present any credible potential for off-site consequences or on-site injury. Note that 911 may also be used to immediately report and describe events that may be limited or under control, and not require a Code 3 response by Signal Hill.

Use 911 for immediate notification:

- if injuries requiring medical attention have occurred or are suspected,
- if Signal Hill has had to evacuate any individuals from any of its facilities, or
- if there is any potential for an incipient stage event propagating to a potential for requiring assistance

12.1 Discovery of Reportable Incident

When discovering an unusual incident, the first priority of the discoverer is to determine whether the situation is immediately life threatening. If any circumstance poses an immediate danger to human health or safety, the discovering personnel shall proceed to:

1. Call "**911**" (outside line) or other known telephone numbers for emergency services in the area;

2. Report the situation to their supervisor; and

3. Notify the EOC Director to mobilize the proper response. If the situation is not immediately life-threatening, the discoverer should notify the SCADA Operators and supervisor of the situation.

12.2 Assessment of Reportable Incident

The Operations Section Chief or on-duty designee will investigate the incident and evaluate the severity of the situation and determine if the situation constitutes an emergency or reportable incident. The Operations Section Chief or designee will proceed to direct the appropriate response to management and the appropriate Emergency Response Team (ERT), and maintain communication with the EOC Director to notify him/her of the progress.

In the event of a potential hazardous materials emergency incident at a field location; the Operations Section Chief will be immediately notified of the situation by the appropriate field personnel. The Operations Section Chief, or designee, will then proceed to make arrangements to contact the EOC Director and, as necessary, the Emergency Response Team.

Following evaluation of the situation, the Operations Section Chief or designee will decide whether or not the situation is to be declared a reportable incident, and will discuss any findings with management. If deemed appropriate, the Emergency Response Plan will be activated and a command center will be established.

12.3 Response to Reportable Incident

Through communication with Operations Section Chief and with the SCADA Operators, the EOC Director will activate the Emergency Response Team. It should be noted that, at any time, the EOC Director may delegate some responsibilities, as appropriate.

During the emergency response, the EOC Director will manage and direct all activities from the EOC. Responding outside personnel will be requested and directed to check in at the command post before being directed to the site of the incident.

Throughout the response, the Incident Commander will be responsible for maintaining the flow of communications from the field to the EOC. The Incident Commander will also be responsible for establishing communications with the Operations Section Chief, who will oversee the activities of the Emergency Response Team.

12.4 External Reporting Procedures

In addition to other responsibilities, the EOC Director will coordinate the required immediate verbal and written notifications to all the required federal, state, and local agencies. Dangers from release, fire, or explosion, which could immediately threaten human health or the environment, will be immediately reported to local authorities. The EOC Director shall:

a. Determine if the evacuation of local areas may be advisable. The EOC Director shall immediately have appropriate local authorities notified, and shall be available to assist appropriate officials in determining whether local areas should be evacuated;

b. Immediately notify all required federal, state, and local agencies using Tables 12-1 and 12-2 to determine the proper reporting requirements. The report shall include:

- Name and telephone number of reporter;
- Name and address of facility;
- Time and type of incident (e.g. release fire);
- Name and quantity of material(s) involved, to the extent known;
- The extent of injuries, if any; and
- The possible hazards to human health or the environment outside the facility.

c. Ensure that a written record of each required notification is made that includes the following:

- The agency called;
- The name of the person making the notification;
- The name of the agency employee to whom notification was made;
- The date and time of the call;
- An identifying incident or report number, if available; and
- Any comments, or instructions, received from the agency.

d. Maintain all notification records at the EOC during the incident.

Table 12-1: CALIFORNIA RELEASE REPORTING SUMMARY (March 2000)

(© ESCI Enviroservices)

	NATURE OF RELEASE OR SPILL	REGULATED SUBSTANCES	REPORTABLE QUANTITY	REGULATED LOCATION OF SPILL OR RELEASE	REPORTING CONTACT	EXEMPTIONS
BP&I LAW H&SC§25507 **19CCR2703**	Release or threatened release; releases on the highway	Hazardous materials; hazardous wastes; nuclear materials; any material with an MSDS; DOT hazardous materials; CERCLA and CWA hazardous substances	Amount posing a significant present or potential hazard to human health, safety, property, or the environment	Releases into the "environment"; including facilities and workplaces	Calif. Office of Emergency Services (OES)	Reasonable belief of no significant present or potential H,S,P,E threat; releases authorized by cognizant regulatory agency
HWCL 22CCR66265.56 & 66265.196	Similar to Fed RCRA	Similar to Fed RCRA; California (non-RCRA) hazardous wastes	Similar to Fed RCRA; 1 pound RQ for HW tanks	Similar to Fed RCRA; broader for HW tanks	OES and CUPA/PA	Similar to Fed RCRA, but CA has fewer hazardous waste exemptions
HWCL H&SC§25113	"Disposal" at an unauthorized location	"Discarded" hazardous materials; RCRA and non-RCRA hazardous wastes	N/A	Any handler of hazardous wastes; permitted and unpermitted facilities; "environment"	Calif. Department of Toxic Substances Control and CUPA/PA	Certain recycled wastes and wastes to be re-used; NPDES-related and other permitted disposals
P-C WQA CWC§13271 **CWC§13272** **23CCR2250-2260**	"Discharges"; unpermitted but intended "discharges" of "wastes" and "pollutants"	Hazardous substances, wastes, sewage, pollutant, or oil	Sewage ≥ 1000 gallons; oil ≥ 42 gallons; CERCLA or CWA RQ; *(Note: CA has no RQ for "wastes" or "pollutants"*	"Waters of the State" including groundwaters and potential to impact groundwater; navigable waters of the US	OES and local Regional Water Quality Control Board (RWQCB)	Discharges authorized by the RWQCB under a Waste Discharge Requirements or waiver; previously reported discharges; certain marine discharges; discharges not impacting 'WoS'
OSPRA/APSA CGC§8670.25.5 **H&SC§25270.8**	Discharge or "threatened discharge"; spill or release	Petroleum oil; refined oil; distillates; petroleum products and fractions; wastes thereof	≥ 42 gallons	"Marine waters" and waters of the state	OES RWQCB	"Authorized" discharges; CWC§13272 exempt discharges
UST H&SC§25295 **H&SC§25295.5** **23CCR2250-2255**	"Suspected" or confirmed release from primary or secondary containment; aboveground spill; unusual operating conditions; or overfill releases	Similar to Calif. Business Plan and Inventory Law	N/A	Releases from "underground storage tank systems" into secondary containment or into the environment	CUPA/PA and/or local RWQCB	Certain farm and residential tanks; sump; separators; refinery pipelines and oil field gathering lines; TPCA-84 pits, ponds, and lagoons
REAL PROP. H&SC§25359.7	Release or threatened release into the environment	CERCLA listed or unlisted hazardous substances; RCRA and non-RCRA hazardous wastes	N/A	Releases into the "environment"; non-residential real property	Owners or lessees of the property must report to] Property buyer or lessee	CERCLA exemptions; natural and related gases; stormwater runoff
CVC CVC§23112.5 **13CCR1166**	Dumping, spill, or release	Similar to Calif. Business Plan and Inventory Law	N/A	Highway; street; or other publicly maintained road	California Highway Patrol (CHP) 911; or CALTRANS	N/A

Table 12-1: CALIFORNIA RELEASE REPORTING SUMMARY (March 2000)

(© ESCI Enviroservices)

	NATURE OF RELEASE OR SPILL	REGULATED SUBSTANCES	REPORTABLE QUANTITY	REGULATED LOCATION OF SPILL OR RELEASE	REPORTING CONTACT	EXEMPTIONS
APSA H&SC§25270.7	Leak detection/groundwater monitoring system trigger	Petroleum	Positive leak detection/groundwater monitoring system trigger	Aboveground petroleum tank with potential to impact groundwater	RWQCB (within 72 hours)	N/A
CA Govt. Code CGC§51018	Rupture, explosion, fire or unintentional liquid leak involving pipeline or pipeline system	Petroleum	> 5 barrels conditionally	Pipelines and pipeline systems (some on-site systems excluded)	Local fire department, OES and State Fire Marshal	Conditionally spills < 5 bbl; non-reportable crude oil pills under field-specific thresholds set per Pub. Res. Code §3233 (unless fire or explosion)
OSPRA 2CCR2406	Discharge threat (apparent or threatened regulatory violation if unabated would subst. Increase discharge risk)	Oil	N/A	From a terminal into marine waters	DOG employee/agent to TPIC/VPIC. If not abated then to DOG, USCG, local DA	N/A
Oil & Gas **14CCR1722**	Spills, blowouts, serious accidents, gas and certain water leaks	Oil	N/A	Not specified	OES (spills only); DOG	N/A
CA Public Utility Code **CPUC§7673**	Railroad train incident with hazardous materials release or threat, or overturned rail car	Hazardous materials	N/A	Railway	Specific inventory and emergency response info and procedures to emergency responders	N/A
HWCL-non emergency **H&SC§25359.4**	Non-emergency releases into the environment	CERCLA listed or unlisted hazardous substances; RCRA and non-RCRA hazardous wastes	CERCLA RQ or amount posing a significant health, safety, or environmental threat	"Unauthorized" release into the environment at any location	Written report to DTSC within 30 days by property owner or releaser	Releases 'in the permit process'; OES/DTSC-reported releases; releases prior to 1/1/94 unless still leaching
SCAQMD Breakdown Rule 430	Equipment breakdown resulting in violation of SCAQMD rule or permit condition	SCAQMD regulated air contaminants	Varies by rule and/or permit	SCAQMD permitted equipment	SCAQMD within 1 hour	CEMS, CFGMS, Reg. XIV compounds/ permits
Cal/OSHA CLC§6409.1 **8CCR342**	Lost time and non-first aid occupational illnesses and injuries or fatalities	N/A	Lost time and non-first aid occupational illness and injury or fatality	Any workplace or worksite	Dept. of Industrial Relations/CalOSHA or insurer within 5 days (immediate if fatality or serious injury/illness)	First-aid illnesses or injuries
RADIATIONH&SC§115110 **17CCR30295**	Certain unplanned contamination events, equipment failures, disabled equipment, unplanned medical treatment, damage to equipment	Radioactive materials or radiation	Varies depending on several incident-specific factors	Not specified	Department of Health Services, Radiological Health Branch	Varies depending on several incident-specific factors

Table 12-2: FEDERAL RELEASE REPORTING SUMMARY (March 2000)

(© ESCI Enviroservices)

	NATURE OF RELEASE OR SPILL	REGULATED SUBSTANCES	REPORTABLE QUANTITY	REGULATED SOURCE & DESTINATION OF RELEASE	REPORTING CONTACT	EXEMPTIONS
CERCLA §103	Broad definition: includes most uncontrolled events, accidents and abandonments	CERCLA listed/unlisted hazardous substances (40 CFR 302.4). Oil and petroleum products **exempt**	1lb. - 5,000 lbs. as in §302.4 table	From on-shore and off-shore "facilities"/vessels into the "environment"	National Response Center (NRC) at 1-800-424-8802 and LEPC/SERC	Certain workplace events; federally permitted releases; nuclear incidents and radionuclide releases
EPCRA §304	Similar to CERCLA – but has potential to affect persons off-site	Extremely hazardous substances (40 CFR 355.20); and CERCLA hazardous substances	EHS & CERCLA RQs; non-RQ-listed EHS - RQ = 1 lb	"Facility" producing, storing, or using hazardous chemicals released into the "environment" with off-site impact	LEPC and SERC (OES & CUPA/PA). Also see 19CCR2705	Similar to CERCLA; releases from vessels
CWA §311	"Discharge" similar to CERCLA	Oil; petroleum products; CWA hazardous substances (40 CFR 116.4)	Oil = "harmful" quantity; hazardous substances = CERCLA RQ	Discharge from on-shore and off-shore facilities/vessels into "navigable waters" and adjoining shorelines	NRC and state agencies. Also see 33CFR153.203	NPDES-related and other permitted discharges
HMTA 49CFR171.15 49CFR171.164 0CFR263.30	"Reportable incident" during the course of transportation	Hazardous materials and hazardous wastes (49 CFR 172.101)	CWA and DOT RQs; No RQ for "immediately reportable incident" (death/injury, >$50K PD; pub. evac., street closures, etc)	Transportation activity, and location of loading, unloading, or temporary storage (all must be under active control of shipping papers)	DOT	Certain unintentional releases of consumer commodities from packages, batteries, paint < 5 gals
RCRA 40CFR265.56 40CFR265.196 40CFR263.30	"Release", fire, or explosion posing threat to human health or environment outside facility; imminent or actual emergency situation	RCRA hazardous wastes and hazardous waste constituents	Statistically significant increase in GW sampling contam.; implem. of RCRA contingency plan; transportation spills	Releases from "hazardous waste facilities"	NRC/EPA (and DOT if during transportation) and state HW agency	Legal disposals at RCRA Subtitle C facilities (HW TSDFs)
TSCA-PCB 40CFR761.123	"Spill" of PCB	Polychlorinated biphenyls (>50 ppm); untested mineral oils	Concentration of ≥ 50 parts per million into nav. waters, gardens, grazing land, etc; >10 lbs any conc.	Waters; sewage systems; public water systems; animal grazing lands; vegetable gardens	USEPA Regional Pesticides and Toxic Substances Branch	N/A
CAA §112(r)	Unanticipated emission of a regulated substance or EHS from a stationary source	77 acutely toxic substances (EHSs); 63 flammable gases, volatile flam. liquids; DOT mass casualty explosives	Hazard based: toxics = 500 - 20,000 lbs. flammables = 10,000 lbs. explosives = 5,000 lbs.	Emissions to ambient air from a stationary source	USEPA Regional office or Chemical Safety & Hazard investigation Board	N/A
UST 40CFR280.52	"Suspected" or confirmed release; aboveground spill; unusual operating conditions; or overfill	CERCLA hazardous substances; oil; refined petroleum products	> 25 gallons; spill causing oil sheen; spill < 25 gallons but cannot be cleaned up within one day; applicable CERCLA RQ	Ground water; surface water; subsurface soils	USEPA Regional office and/or state/local admin. agency	Farm/residential/heating oil; pipeline facility; storm or wastewater collection facility; flow-through process tanks; RCRA holding tanks; above-floor tanks and related piping.

13.0 GENERAL STRATEGIES

This ERP is not meant to replace common sense or other more appropriate actions that may not be mentioned in the plan. Responders during an emergency should continually evaluate the effectiveness of the actions recommended in this ERP and make the appropriate adjustments to the response based on past experience and training.

Although this plan provides a framework for emergency response, it does not attempt to identify and discuss every potential situation or problem which may result during an emergency. A situation may develop which warrants quick operational changes in order to prevent serious danger of life and/or extensive property damage. In most cases, such time-sensitive decisions shall be made by personnel initially encountering the potentially dangerous situation. Actions which could have a significant effect on other portions of the distribution system, or which are considered major, should only be taken if they are absolutely necessary in the judgment of personnel that initiate such actions.

14.0 ADDITIONAL INFORMATION

The following individual may be contacted for further information regarding this emergency response plan:

- Cecil Looney, Water Superintendent

The Risk and Safety Manager is responsible for periodically reviewing and ensuring necessary changes and revisions to this plan are completed, coordinated, published, and distributed. The annual review of this plan and other documents that provide the legal basis for emergency planning ensures compliance with SEMS and other applicable state-mandated emergency management programs.

15.0 ACKNOWLEDGMENT

The following acknowledges the participation and contribution of the following individuals for the Signal Hill Emergency Response Plan:

City of Signal Hill Public Works Department (Signal Hill)

- Cecil Looney
- Vacant – Director Steve Myrter
- Diane Bartosch

Risk Management Professionals, Inc.:

- Matthew D. Luchsinger
- Maria G Monge

Please direct any questions or comments to the Deputy Director of Public Works, or Risk Management Professionals Staff at 949/282-0123.

Attachment 4B
City of Signal Hill
Hazard Mitigation Plan

Final Plan

January 8, 2018 | # Hazard Mitigation Plan

emergency planning consultants

CITY OF SIGNAL HILL CALIFORNIA

Credits

Special Thanks

Hazard Mitigation Planning Team:

Agency	Name	Department	Position
City of Signal Hill	Richard Johnson, Chair	Police	Emergency Operations Coordinator
	Selena Alanis	Community Development	Associate Planner
	Travis Brooks	Public Works	Management Analyst
	Scott Charney	Community Development	Community Development Director
	Charlie Honeycutt	Administration	City Manager
	Michael Langston	Police	Chief of Police
	Aly Mancini	Community Services	Community Services Director
	Terri Marsh	Finance	Finance Director
	Steve Myrter	Public Works	Director
Emergency Planning Consultants	Carolyn J. Harshman	Consultant	President

Acknowledgements

City of Signal Hill

- ✓ Lori Y. Woods, Mayor
- ✓ Tina L. Hansen, Vice Mayor
- ✓ Larry Forester, Council Member
- ✓ Michael J. Noll, Council Member
- ✓ Edward H.J. Wilson, Council Member

Point of Contact

To request information or provide comments regarding this mitigation plan, please contact:

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Emergency Planning Consultants

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Mapping

The maps in this plan were provided by the City of Signal Hill, County of Los Angeles, Federal Emergency Management Agency (FEMA), or were acquired from public Internet sources. Care was taken in the creation of the maps contained in this Plan, however they are provided "as is". The City of Signal Hill cannot accept any responsibility for any errors, omissions or positional accuracy, and therefore, there are no warranties that accompany these products (the maps). Although information from land surveys may have been used in the creation of these products, in no way does this product represent or constitute a land survey. Users are cautioned to field verify information on this product before making any decisions.

Mandated Content

In an effort to assist the readers and reviewers of this document, the jurisdiction has inserted "markers" emphasizing mandated content as identified in the Disaster Mitigation Act of 2000 (Public Law – 390). Following is a sample marker:

EXAMPLE

Q&A | ELEMENT A: PLANNING PROCESS | A1

Q A1: Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))

A:

Table of Contents

Part I: PLANNING PROCESS

Introduction

The Hazard Mitigation Plan (Mitigation Plan) was prepared in response to Disaster Mitigation Act of 2000 (DMA 2000). DMA 2000 (also known as Public Law 106-390) requires state and local governments to prepare mitigation plans to document their mitigation planning process, and identify hazards, potential losses, mitigation needs, goals, and strategies. This type of planning supplements the City's comprehensive land use planning and emergency management planning programs. This document is a federally mandated update to the City of Signal Hill 2012 Hazard Mitigation Plan and ensures continuing eligibility for Hazard Mitigation Grant Program (HMGP) funding.

DMA 2000 was designed to establish a national program for pre-disaster mitigation, streamline disaster relief at the federal and state levels, and control federal disaster assistance costs. Congress believed these requirements would produce the following benefits:

- ✓ Reduce loss of life and property, human suffering, economic disruption, and disaster costs.
- ✓ Prioritize hazard mitigation at the local level with increased emphasis on planning and public involvement, assessing risks, implementing loss reduction measures, and ensuring critical facilities/services survive a disaster.
- ✓ Promote education and economic incentives to form community-based partnerships and leverage non-federal resources to commit to and implement long-term hazard mitigation activities.

The following FEMA definitions are used throughout this plan (Source: FEMA, 2002, *Getting Started, Building Support for Mitigation Planning*, FEMA 386-1):

Hazard Mitigation – "Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards".

Planning – "The act or process of making or carrying out plans; specifically, the establishment of goals, policies, and procedures for a social or economic unit."

Planning Approach

The four-step planning approach outlined in the FEMA publication, *Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies* (FEMA 386-3) was used to develop this plan:

- ✓ **Develop mitigation goals and objectives -** The risk assessment (hazard characteristics, inventory, and findings), along with municipal policy documents, were utilized to develop mitigation goals and objectives.
- ✓ **Identify and prioritize mitigation actions -** Based on the risk assessment, goals and objectives, existing literature/resources, and input from participating entities, mitigation activities were identified for each hazard. Activities were 1) qualitatively evaluated

against the goals and objectives, and other criteria; 2) identified as high, medium, or low priority; and 3) presented in a series of hazard-specific tables.

- ✓ **Prepare implementation strategy -** Generally, high priority activities are recommended for implementation first. However, based on community needs and goals, project costs, and available funding, some medium or low priority activities may be implemented before some high priority items.
- ✓ **Document mitigation planning process -** The mitigation planning process is documented throughout this plan.

Hazard Land Use Policy in California

Planning for hazards should be an integral element of any City's land use planning program. All California cities and counties have General Plans (also known as Comprehensive Plans) and the implementing ordinances that are required to comply with the statewide land use planning regulations.

The continuing challenge faced by local officials and state government is to keep the network of local plans effective in responding to the changing conditions and needs of California's diverse communities, particularly in light of the very active seismic region in which we live.

Planning for hazards requires a thorough understanding of the various hazards facing the City and region as a whole. Additionally, it's important to take an inventory of the structures and contents of various City holdings. These inventories should include the compendium of hazards facing the City, the built environment at risk, the personal property that may be damaged by hazard events and most of all, the people who live in the shadow of these hazards. Such an analysis is found in this hazard mitigation plan.

State and Federal Partners in Hazard Mitigation

All mitigation is local and the primary responsibility for development and implementation of risk reduction strategies and policies lies with each local jurisdiction. Local jurisdictions, however, are not alone. Partners and resources exist at the regional, state and federal levels. Numerous California state agencies have a role in hazards and hazard mitigation.

Some of the key agencies include:

- ✓ California Office of Emergency Services (Cal OES) is responsible for disaster mitigation, preparedness, response, recovery, and the administration of federal funds after a major disaster declaration;
- ✓ Southern California Earthquake Center (SCEC) gathers information about earthquakes, integrates information on earthquake phenomena, and communicates this to end-users and the general public to increase earthquake awareness, reduce economic losses, and save lives.
- ✓ California Department of Forestry and Fire Protection (CAL FIRE) is responsible for all aspects of wildland fire protection on private and state properties, and administers forest practices regulations, including landslide mitigation, on non-federal lands.
- ✓ California Division of Mines and Geology (DMG) is responsible for geologic hazard characterization, public education, and the development of partnerships aimed at reducing risk.

- ✓ California Division of Water Resources (DWR) plans, designs, constructs, operates, and maintains the State Water Project; regulates dams; provides flood protection and assists in emergency management. It also educates the public, serves local water needs by providing technical assistance
- ✓ FEMA provides hazard mitigation guidance, resource materials, and educational materials to support implementation of the capitalized DMA 2000.
- ✓ United States Census Bureau (USCB) provides demographic data on the populations affected by natural disasters.
- ✓ United States Department of Agriculture (USDA) provides data on matters pertaining to land management.

Q&A | ELEMENT A: PLANNING PROCESS | A3

Q: A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))

A: See **Planning Phases Timeline** below.

Stakeholders

A Hazard Mitigation Planning Team (Planning Team) consisting of department representatives from City of Signal Hill staff worked with Emergency Planning Consultants to create the updated Plan. **The Planning Team served as the primary stakeholders throughout the planning process.**

As required by DMA 2000, the Planning Team informed the general public and external agencies (including special districts and adjoining jurisdictions) of the planning process and provided opportunities for input during both the plan writing and review phases. **The general public and external agencies served as secondary stakeholders in the planning process.**

Hazard Mitigation Legislation

Hazard Mitigation Grant Program

In 1974, Congress enacted the Robert T. Stafford Disaster Relief and Emergency Act, commonly referred to as the Stafford Act. In 1988, Congress established the Hazard Mitigation Grant Program (HMGP) via Section 404 of the Stafford Act. Regulations regarding HMGP implementation based on the DMA 2000 were initially changed by an Interim Final Rule (44 CFR Part 206, Subpart N) published in the Federal Register on February 26, 2002. A second Interim Final Rule was issued on October 1, 2002.

The HMGP helps states and local governments implement long-term hazard mitigation measures for natural hazards by providing federal funding following a federal disaster declaration. Eligible applicants include state and local agencies, Indian tribes or other tribal organizations, and certain nonprofit organizations.

In California, the HMGP is administered by Cal OES. Examples of typical HMGP projects include:

- ✓ Property acquisition and relocation projects

- ✓ Structural retrofitting to minimize damages from earthquake, flood, high wind, wildfire, or other natural hazards
- ✓ Elevation of flood-prone structures
- ✓ Vegetative management programs, such as:
  - Brush control and maintenance
  - Fuel break lines in shrubbery
  - Fire-resistant vegetation in potential wildland fire areas

Pre-Disaster Mitigation Program

The Pre-Disaster Mitigation Program (PDM) was authorized by §203 of the Stafford Act, 42 United States Code, as amended by §102 of the DMA 2000. Funding is provided through the National Pre-Disaster Mitigation Fund to help state and local governments (including tribal governments) implement cost-effective hazard mitigation activities that complement a comprehensive mitigation program.

In Fiscal Year 2009, two types of grants (planning and competitive) were offered under the PDM Program. Planning grants allocate funds to each state for Mitigation Plan development. Competitive grants distribute funds to states, local governments, and federally recognized Indian tribal governments via a competitive application process. FEMA reviews and ranks the submittals based on pre-determined criteria. The minimum eligibility requirements for competitive grants include participation in good standing in the National Flood Insurance Program (NFIP) and a FEMA-approved Mitigation Plan.
(Source: http://www.fema.gov/fima/pdm.shtm)

Flood Mitigation Assistance Program

The Flood Mitigation Assistance (FMA) Program was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 (42 U.S.C. 4101). Financial support is provided through the National Flood Insurance Fund to help states and communities implement measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP.

"Floods and hurricanes happen. The hazard itself is not the disaster – it's our habits, it's how we build and live in those areas…that's the disaster."

Craig Fugate,
FEMA Director

Three types of grants are available under FMA: planning, project, and technical assistance. Planning grants are available to states and communities to prepare Flood Mitigation Plans. NFIP-participating communities with approved Flood Mitigation Plans can apply for project grants to implement measures to reduce flood losses. Technical assistance grants in the amount of 10 percent of the project grant are available to the state for program administration. Communities that receive planning and/or project grants must participate in the NFIP. Examples of eligible projects include elevation, acquisition, and relocation of NFIP-insured structures. (Source: http://www.fema.gov/fima/fma.shtm)

Q&A | ELEMENT C. MITIGATION STRATEGY | C2

Q: C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))

A: See **NFIP Participation** below.

National Flood Insurance Program

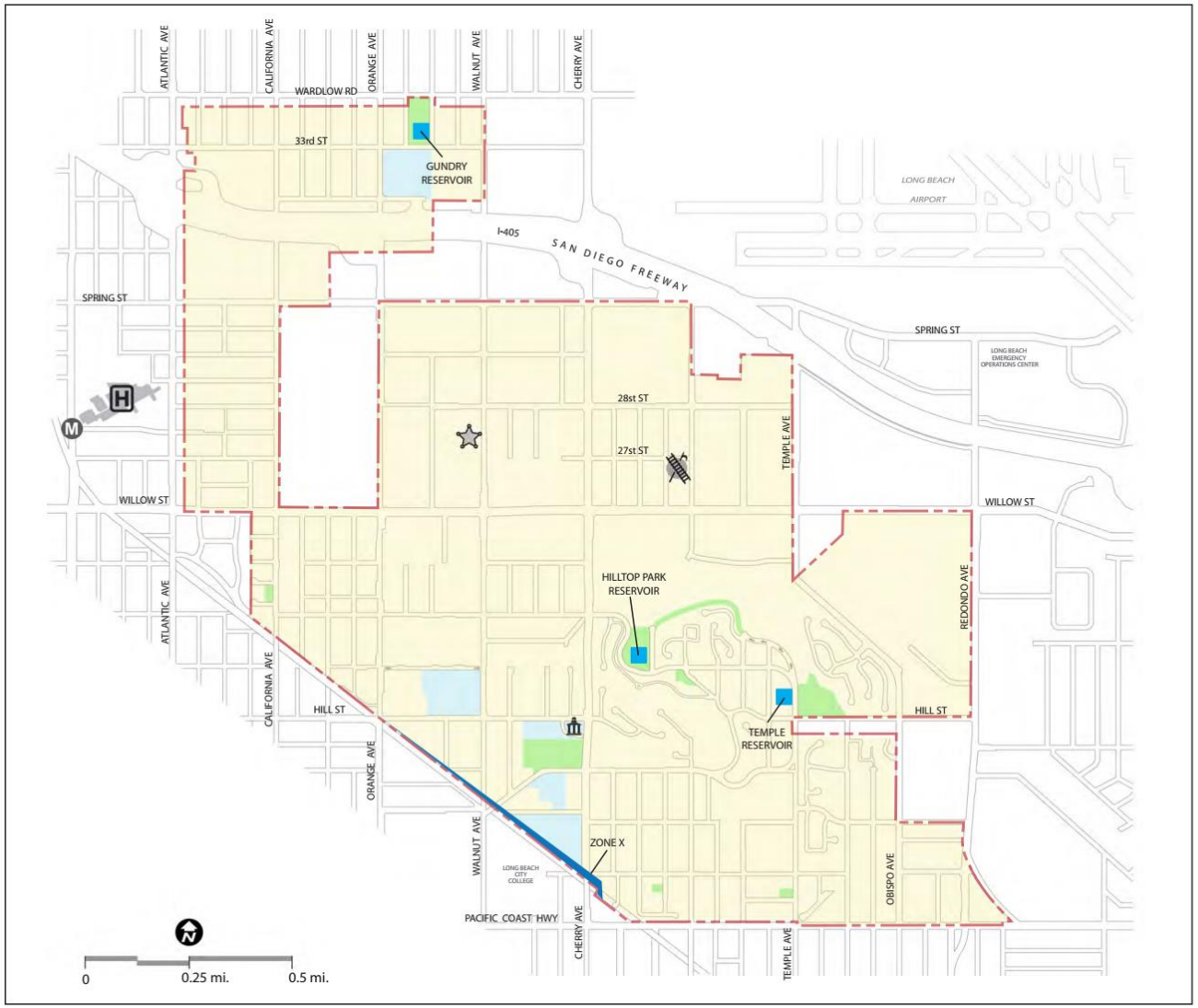
Established in 1968, the NFIP provides federally-backed flood insurance to homeowners, renters, and businesses in communities that adopt and enforce floodplain management ordinances to reduce future flood damage.

NFIP Participation

The City of Signal Hill participates in NFIP and the FEMA FIRM maps for the City of Signal Hill were last updated September 26, 2008. Unfortunately, FEMA flood maps are not entirely accurate. These studies and maps represent flood risk at the point in time when FEMA completed the studies, and does not incorporate planning for floodplain changes in the future due to new development. Although FEMA is considering changing that policy, it is optional for local communities.

According to FEMA, the City of Signal Hill is designated a No Special Flood Hazard Area (NSFHA). A Non-Special Flood Hazard Area (NSFHA) is an area that is in a moderate- to low-risk flood zone (Zones B, C, X Pre- and Post-FIRM). An NSFHA is not in any immediate danger from flooding caused by overflowing rivers or hard rains. According to the City's 2016 General Plan Safety Element, Signal Hill is not subject to flood hazards. Only a small area along the city's southwestern boundary is designated as Zone X on the Federal Emergency Management Agency's Flood Insurance Rate Map, indicating no major flood risk. The remainder of the City is not zoned. Accordingly, it is concluded that there are no special flood hazard areas in the City as shown on **Map: Flood Hazards**.

Map: Flood Hazards
(Source: City of Signal Hill General Plan – Safety Element 2016)



City of Signal Hill
GENERAL PLAN

Safety Element
October 2010

DRAFT

Legend

- City of Signal Hill Boundary
- Reservoir Location
- Zone X Flood Risk

Note: All areas outside of Zone X are unzoned. There are no special flood hazard areas within Signal Hill.

Figure 7
Flood Hazards

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B4

Q: B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))

A: See **Repetitive Loss Properties** below.

Repetitive Loss Properties

Repetitive Loss Properties (RLPs) are most susceptible to flood damages; therefore, they have been the focus of flood hazard mitigation programs. Unlike a Countywide program, the Floodplain Management Plan (FMP) for repetitive loss properties involves highly diversified property profiles, drainage issues, and property owner's interest. It also requires public involvement processes unique to each RLP area. The objective of an FMP is to provide specific potential mitigation measures and activities to best address the problems and needs of communities with repetitive loss properties. A repetitive loss property is one for which two or more claims of $1,000 or more have been paid by the National Flood Insurance Program (NFIP) within any given ten-year period. According to FEMA resources, there are no Repetitive Loss Properties within the City of Signal Hill.

State and Federal Guidance in Hazard Mitigation

While local jurisdictions have primary responsibility for developing and implementing hazard mitigation strategies, they are not alone. Various state and federal partners and resources can help local agencies with mitigation planning.

The Mitigation Plan was prepared in accordance with the following regulations and guidance documents:

- ✓ DMA 2000 (Public Law 106-390, October 10, 2000)
- ✓ 44 CFR Parts 201 and 206, Mitigation Planning and Hazard Mitigation Grant Program, Interim Final Rule, October 1, 2002
- ✓ 44 CFR Parts 201 and 206, Mitigation Planning and Hazard Mitigation Grant Program, Interim Final Rule, February 26, 2002
- ✓ How-To Guide for Using HAZUS-MH for Risk Assessment, (FEMA 433), February 2004
- ✓ Mitigation Planning "How-to" Series (FEMA 386-1 through 9 available at: http://www.fema.gov/fima/planhowto.shtm)
- ✓ Getting Started: Building Support For Mitigation Planning (FEMA 386-1)
- ✓ Understanding Your Risks: Identifying Hazards and Estimating Losses (FEMA 386-2)
- ✓ Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies (FEMA 386-3)
- ✓ Bringing the Plan to Life: Implementing the Mitigation Plan (FEMA 386-4)
- ✓ Using Benefit-Cost Review in Mitigation Planning (FEMA 386-5)
- ✓ Integrating Historic Property and Cultural Resource Considerations into Mitigation Planning (FEMA 386-6)
- ✓ Integrating Manmade Hazards Into Mitigation Planning (FEMA 386-7)
- ✓ Multi-Jurisdictional Mitigation Planning (FEMA 386-8)

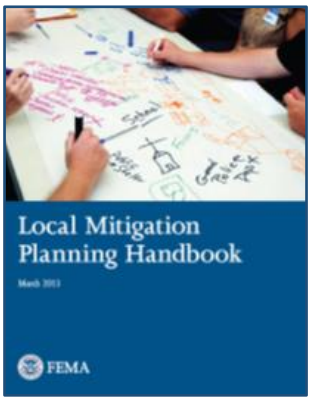
- ✓ Using the Mitigation Plan to Prepare Successful Mitigation Projects (FEMA 386-9)
- ✓ State and Local Plan Interim Criteria Under the DMA 2000, July 11, 2002, FEMA
- ✓ Mitigation Planning Workshop For Local Governments-Instructor Guide, July 2002, FEMA
- ✓ Report on Costs and Benefits of Natural Hazard Mitigation, Document #294, FEMA
- ✓ LHMP Development Guide – Appendix A - Resource, Document, and Tool List for Local Mitigation Planning, December 2, 2003, Cal OES
- ✓ Local Mitigation Plan Review Guide (FEMA 2011)
- ✓ Local Mitigation Planning Handbook (FEMA 2013)

How is the Plan Organized?

The structure of the plan enables the reader to use a section of interest to them and allows the City to review and update sections when new data is available. The ease of incorporating new data into the plan will result in a Mitigation Plan that remains current and relevant.

Following is a description of each section of the plan:

Part I: Planning Process



Introduction

Describes the background and purpose of developing a mitigation plan.

Planning Process

Describes the mitigation planning process including: stakeholders and integration of existing data and plans.

Part II: Risk Assessment

Community Profile

Summarizes the history, geography, demographics, and socioeconomics of the City.

Risk Assessment

This section provides information on hazard identification, vulnerability and risk associated with hazards in the City.

City-Specific Hazard Analysis

Describes the natural hazards posing a significant threat to the City including:

Earthquake | Landslide | Windstorm | Drought

Each City-Specific Hazard Analysis includes information on previous occurrences, local conditions, hazard assessment, and local impacts.

Part III: Mitigation Strategies

Mitigation Strategies

Documents the goals, community capabilities, and priority setting methods supporting the Plan. Also highlights the Mitigation Actions Matrix: 1) goals met; 2) identification,

assignment, timing, and funding of mitigation activities; 3) benefit/cost/priorities; 4) plan implementation method; and 5) activity status.

Plan Maintenance

Establishes tools and guidelines for maintaining and implementing the Mitigation Plan.

Part IV: Appendix

The plan appendices are designed to provide users of the Mitigation Plan with additional information to assist them in understanding the contents of the mitigation plan, and potential resources to assist them with implementation.

General Hazard Overviews

Generalized subject matter information discussing the science and background associated with the identified hazards.

Attachments

FEMA Letter of Approval
City Council Staff Report
City Council Resolution
Planning Team sign-in sheets
Web postings and notices
References

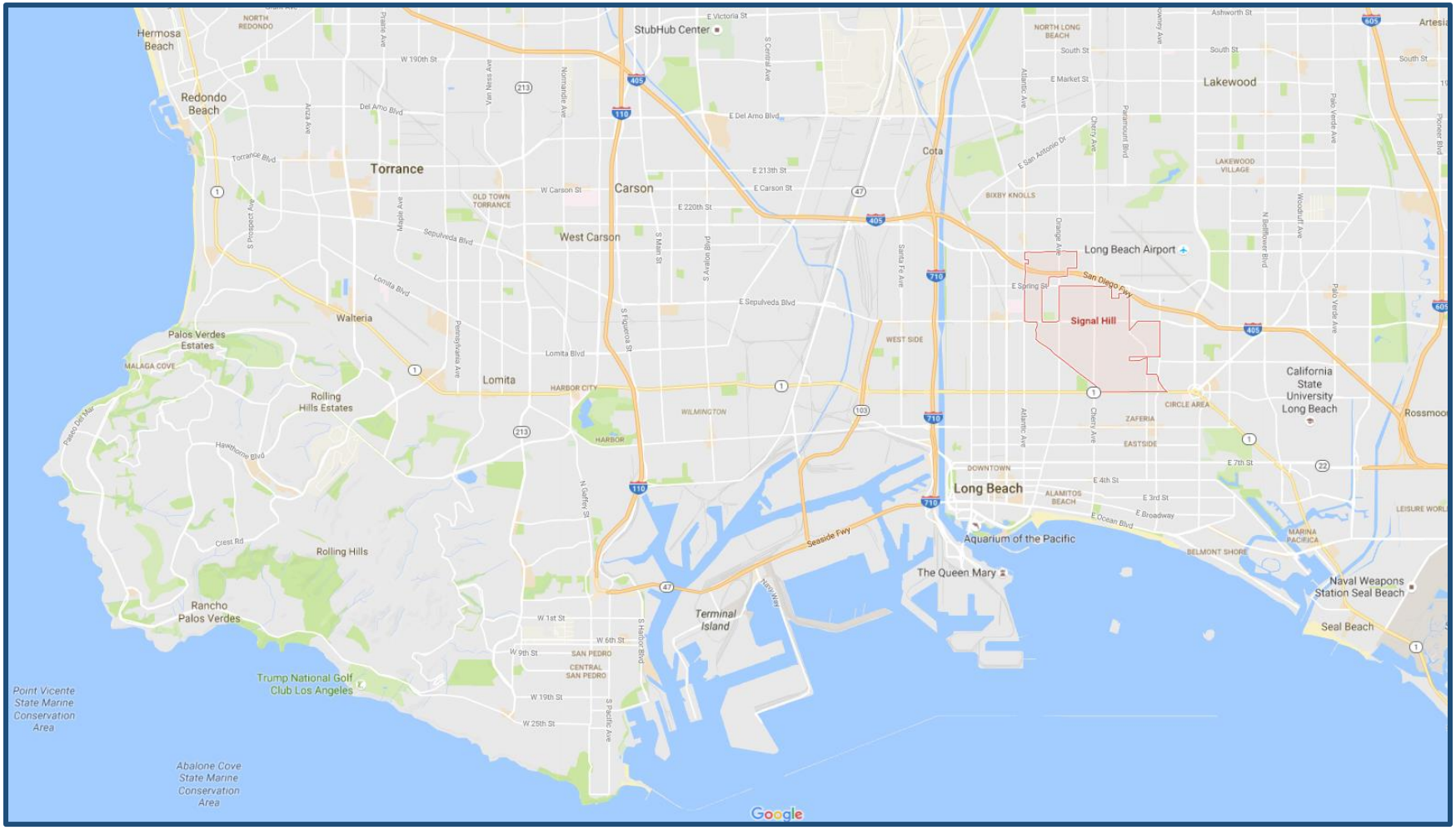
Plan Adoption and Approval

As per DMA 2000 and supporting Federal regulations, the Mitigation Plan is required to be adopted by the City Council and approved by FEMA. See the **Planning Process Section** for details.

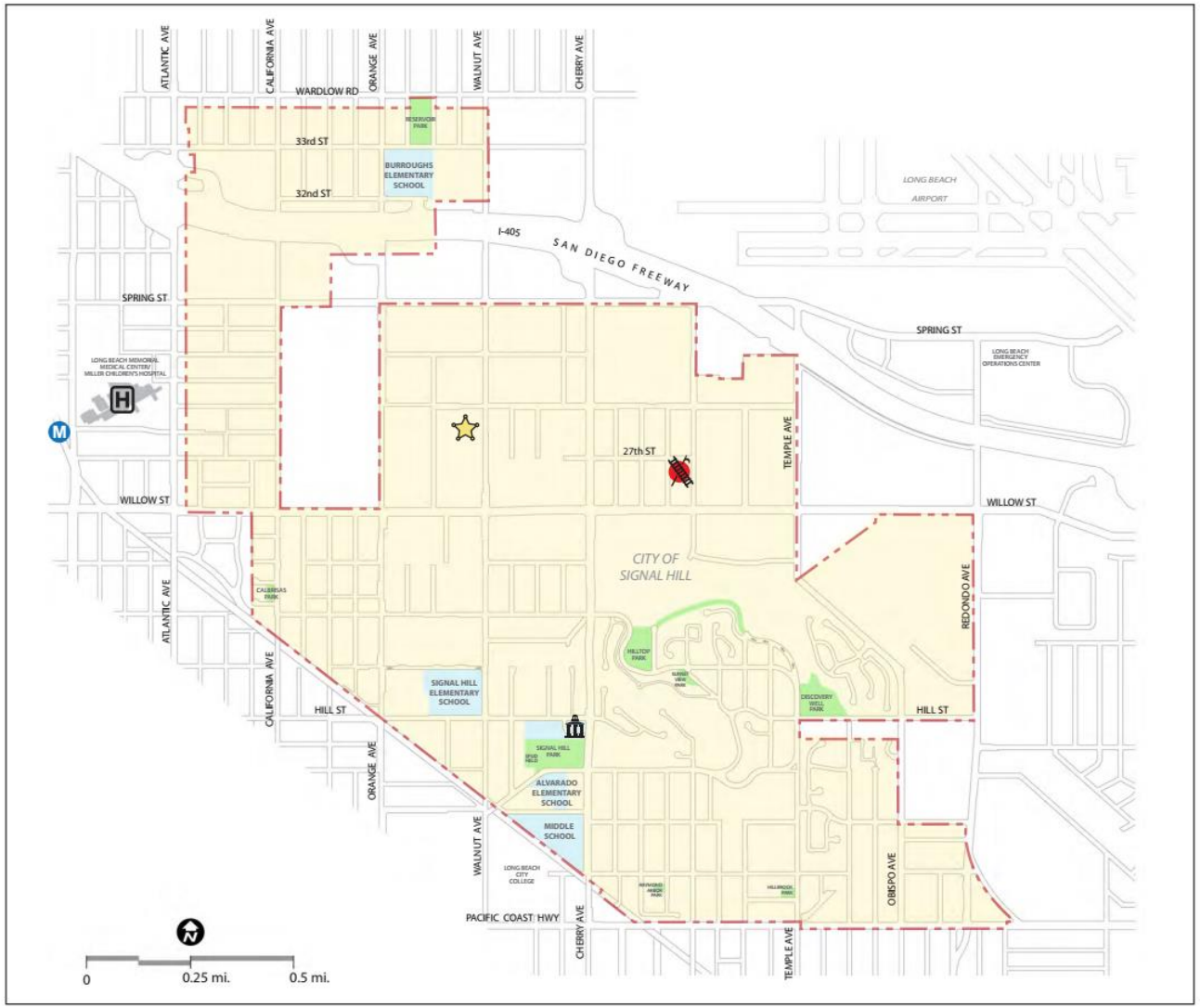
Who Does the Mitigation Plan Affect?

This plan provides a framework for planning for natural hazards. The resources and background information in the plan are applicable City-wide and to City-owned facilities outside of the City boundaries, and the goals and recommendations provide groundwork for local mitigation plans and partnerships. **Map: City of Signal Hill** shows the regional proximity of the City to its adjoining communities.

Map: City of Signal Hill - Regional
(Source: Google Maps)



Map: City of Signal Hill - Local
(Source: City of Signal Hill General Plan – Safety Element 2016)



City of Signal Hill
GENERAL PLAN

Safety Element
October 2010

- City of Signal Hill Boundary
- Parks
- Schools
- Metro Rail Station
- Hospital
- Police Station & Emergency Operations Center
- Fire Station
- Civic Center

Planning Process

Throughout the project, the City followed its traditional approach to developing policy documents which included preparation of a First Draft Plan for review by the City's Hazard Mitigation Planning Team who served as the primary stakeholders. Next, following necessary updates, a Second Draft Plan was shared with the general public and external agencies (special districts and adjoining jurisdictions) during the plan writing phase. The general public and external agencies served as the secondary stakeholders. Next, the comments gathered from the secondary stakeholders were incorporated into a Third Draft Plan which was submitted to Cal OES and FEMA along with a request for a conditional approval.

Next, the Planning Team completed amendments to the Plan to reflect mandated input by Cal OES and FEMA. The Fourth Draft Plan was then posted for an additional opportunity for input from the secondary stakeholders. Following the review period, comments gathered were incorporated into a City Council Staff Report and a public notice was placed on the City's website announcing the City Council's public meeting. Following adoption by the City Council, the Final Draft Plan was re-submitted to FEMA with a request for final approval. The planning process described above is portrayed below in a timeline:

Q&A | ELEMENT A: PLANNING PROCESS | A1

Q: A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))

A: See **Planning Phases Timeline** below.

Q&A | ELEMENT A: PLANNING PROCESS | A2

Q: A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))

A: See **Planning Phases Timeline** below.

Q&A | ELEMENT A: PLANNING PROCESS | A3

Q: A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))

A: See **Planning Phases Timeline** below.

Q&A | ELEMENT E: PLAN ADOPTION | E1

Q: E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))

A: See **Planning Phases Timeline** below.

Figure: Planning Phases Timeline

PLANNING PHASES TIMELINE				
Plan Writing Phase (First & Second Draft Plan)	**Plan Review Phase (Third & Fourth Draft Plan)**	**Plan Adoption Phase (Fourth Draft Plan)**	**Plan Approval Phase (Final Draft & Final Plan)**	**Plan Implementation Phase**
• Planning Team input – research, meetings, writing, review of First Draft Plan • Incorporate input from the Planning Team into Second Draft Plan • Invite general public and external agencies to review, comment, and contribute to the Second Draft Plan. • Incorporate input into the Third Draft Plan	• Third Draft Plan sent to Cal OES and FEMA for conditional approval • Address any mandated revisions identified by Cal OES and FEMA into Fourth Draft Plan • Invite general public and external agencies to review, comment, and contribute to the Fourth Draft Plan	• Incorporate input into the City Council staff report. • Post public notice of City Council meeting • Fourth Draft Plan distributed to City Council in advance of meeting • Present Fourth Draft Plan to the City Council • City Council adopts Plan • Incorporate input from City Council meeting into Final Draft Plan	• Submit Final Draft Plan to FEMA with request for final approval • Receive FEMA approval • Incorporate FEMA approval into the Final Plan	• Conduct quarterly Planning Team meetings • Integrate mitigation action items into budget, CIP and other funding and strategic documents

Plan Methodology

The Planning Team discussed knowledge of natural hazards and past historical events, as well as planning and zoning codes, ordinances, and recent planning decisions.

The rest of this section describes the mitigation planning process including 1) Planning Team involvement, 2) extended Planning Team support (department heads), 3) public and external agency involvement; and 4) integration of existing data and plans.

Q&A | ELEMENT A: PLANNING PROCESS | A1

Q: A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))

A: See **Table: Planning Team Involvement and Level of Participation** below.

Planning Team Involvement

The Planning Team consisted of representatives from City of Signal Hill departments related to hazard mitigation processes. The Planning Team served as the primary stakeholders throughout the planning process. Citizens and businesses (general public) along with external agencies (special districts and adjoining jurisdictions) served as secondary stakeholders in the planning process. The Planning Team was responsible for the following tasks:

- ✓ Confirming planning goals
- ✓ Prepare timeline for plan update
- ✓ Ensure plan meets DMA 2000 requirements
- ✓ Organize and solicit involvement of public and external agencies
- ✓ Analyze existing data and reports
- ✓ Update hazard information
- ✓ Review HAZUS loss projection estimates
- ✓ Update status of Mitigation Action Items
- ✓ Develop new Mitigation Action Items
- ✓ Participate in Planning Team meetings and City Council public meeting

The Planning Team, with assistance from Emergency Planning Consultants, identified and profiled hazards; determined hazard rankings; estimated potential exposure or losses; evaluated development trends and specific risks; and developed mitigation goals and action items.

Table: Planning Team Level of Participation

Name	Research and Writing of Plan	Planning Team Meeting 8/10/16	Planning Team Meeting 8/31/2016	Planning Team Meeting 9/7/2016	Planning Team Review and Comment on First Draft Plan	Share Second Draft with General Public and External Agencies	Submit Third Draft Plan to Cal OES/FEMA for Conditional Approval	Post Fourth Draft Plan for Review by General Public and External Agencies	Present Fifth Draft Plan to City Council at Public Meeting	Submit Final Draft Plan to FEMA for Final Approval
City of Signal Hill										
Selena Alanis			X		X					
Travis Brooks		X			X					
Scott Charney		X	X		X					
Charlie Honeycutt		X	X		X				X	
Richard Johnson, Chair		X	X		X	X	X	X	X	X
Michael Langston		X	X		X					
Aly Mancini		X	X		X					
Terri Marsh		X	X		X					
Steve Myrter			X		X					
Emergency Planning Consultants										
Carolyn J. Harshman	X	X								

Table: Planning Team Timeline

	April 2016	May	June	July	August	September	October	November	December	January 2017	February-July	August	September
Research and Writing of First Draft Plan	X	X	X	X	X								
Planning Team Meetings					X	X							
Planning Team Comment on First Draft Plan						X							
Share Second Draft Plan with General Public and External Agencies							X	X	X				
Submit Third Draft Plan to Cal OES/FEMA for Approvable Pending Adoption										X			
Incorporate mandated amendments into Fourth Draft Plan										X			
Post Fourth Draft Plan for Review by General Public and External Agencies along with posting of City Council meeting.												X	
Present Fourth Draft Plan to City Council													X
Submit Final Draft Plan to FEMA for Final Approval													X
Incorporate FEMA Approval into Final Plan													X

Q&A | ELEMENT A: PLANNING PROCESS | A2

Q: A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))

A: See **General Public and External Agency Involvement** below.

Q&A | ELEMENT A: PLANNING PROCESS | A3

Q: A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))

A: See **General Public and External Agency Involvement** below.

General Public and External Agency Involvement

The Planning Team provided data and expertise during plan writing phase. This effort was supplemented through the assistance of the general public and external agencies (special districts and adjoining jurisdictions).

The City posted public notices announcing the availability of the Second Draft Plan on its website and other customary posting locations including Signal Hill Reservoir Park, Signal Hill Library, and Signal Hill City Hall. Copies of the postings and the website landing page are located in the **Appendix**. The postings and website landing page directed the general public to access to the Second Draft Plan along with contact information for sharing of input.

External agencies listed below were invited via email and provided with an electronic link to the City's website. Following is the email distributed along with the invitation to comment.

Figure: External Agencies Email Invite

The City of Signal Hill invites our external agency partners to review the subject line document. This external agency review notice complies with the regulatory requirement to solicit comment and/or input from local and regional public agencies and NGOs to the city and to include, where possible, that input into the planning process. Please review and respond with any comment on the Signal Hill Hazard Mitigation Plan by **November 25, 2016**. Please use the following link to our Dropbox account to access the plan.
https://www.dropbox.com/s/nesdugprbqch5hw/Signal%20Hill%20HazMit%2011.09.16.docx?dl=0

Submit your comments via email to:
Richard Johnson
Emergency Management Coordinator
Signal Hill Police Department
2745 Walnut Ave.
Signal Hill, Calif. 90755
rjohnson@signalhillpd.org

Thank you in advance for your time and effort in assisting the city in creating a dynamic and accessible Hazard Mitigation Plan.
Regards,
Richard Johnson
Emergency Operations Coordinator
Signal Hill Police Department
2745 Walnut Avenue,
Signal Hill, CA 90755
Office: (562) 989-7239 rjohnson@signalhillpd.org

Table: External Agencies

Agency	Name & Job Title	Comments
Long Beach Police Department	Eric Matusak, Emergency Operations Coordinator	No comments received
Long Beach Fire Department	David Vinnen, Deputy Fire Marshal	No comments received
Long Beach Emergency Communication and Operations Center	Reginald Harrison, Director, Emergency Communications and Operations	No comments received
Long Beach Water Department	Sandy Fox, Executive Secretary to the Board of Water Commissioners & General Manager	No comments received
Long Beach Gas and Oil Department	Steve Bateman, Manager, Engineering	No comments received
Long Beach City Manager	Patrick West, City Manager	No comments received
Long Beach Development Services	Amy Bodek, Director, Development Services	No comments received
Los Angeles County Office of	Ashu Palta, Program Manager	No comments received

Emergency Management		
Los Angeles County Fire Department	Will Pryor, Battalion Chief, Battalion 9	No comments received
Los Angeles County Sheriff		No comments received
Long Beach Unified School District	Cathy Coy, Emergency Preparedness Program Manager	No comments received
Long Beach Community College	Tim Wootton, Director, Facilities Management	No comments received
Southern California Edison	Constance Turner, Government Affairs Representative	No comments received
County Sanitation Districts of Los Angeles County	Raymond Tremblay, Facilities Planning	No comments received
Long Beach Memorial Medical Center	Ginger Alhadeff	No comments received
Long Beach Memorial Medical Center	Steve Shrubb	No comments received
American Red Cross, Territory 4	Priscilla Schoch, External Relations Manager	No comments received
Signal Hill Petroleum	Sean McDaniel, Vice-President, Production and Operations	No comments received
City of Lakewood City Manager	Howard Chambers, City Manager	No comments received
City of Downey City Manager	Gilbert Livas, City Manager	No comments received
City of Downey Community Development	W. Davis, City Planner	No comments received

In advance of the City Council public meeting, the general public (via public noticing) and external agencies (via email invitation) were informed of the Fourth Draft Plan and encouraged to provide input and attend the public meeting. Gathered comments from the public and external agencies were noted in the City Council Staff Report and added to the Final Draft Plan.

Q&A | ELEMENT C. MITIGATION STRATEGY | C1

Q: C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))

A: See **Capability Assessment – Existing Processes and Programs and Table: Capability Assessment – Existing Processes and Programs** below.

Capability Assessment – Existing Processes and Programs

The City will incorporate mitigation planning as an integral component of daily operations. This will be accomplished by the Planning Team working with their respective departments to integrate mitigation strategies into the planning documents and operational guidelines within the City. In addition to the Capability Assessment below, the Planning Team will strive to identify additional policies, programs, practices, and procedures that could be created or modified to address mitigation activities.

Table: Capability Assessment - Existing Processes and Programs

Process	Action	Implementation of Plan
Hazard Mitigation	Ensure representation on Planning Team includes all departments responsible for the existing processes and programs identified in this table.	✓ *Planning Team's effectiveness in implementing Plan and creating a culture of mitigation* ✓ *Planning Team members become "ambassadors" in the various departments charged with influencing development, infrastructure, and future planning* ✓ *Involve Hazard Mitigation Planning Team in review of future updates of the City General Plan or Zoning Ordinance to ensure consideration of threats posed by hazards (See Mitigation Actions Matrix)*
Administrative	Departmental or organizational work plans, policies, and procedural changes	✓ *City Administration* ✓ *Community Development Department* ✓ *Public Works Department* ✓ *Other departments as appropriate* ✓ *Continue training staff for all aspects of Emergency Management and ensure adequate staffing levels by cross-training staff for each identified capability/task*
	Other plans	✓ *Reference plan in Emergency Operations Plan* ✓ *Address plan findings and incorporate mitigation activities in General Plan*
Budgetary	Capital and operational budgets	✓ *Include line item mitigation measures in budget as appropriate*
Regulatory	Executive orders, ordinances, and other directives	✓ *Building Code* ✓ *Capital Improvement Plan (Require hazard mitigation in design of new construction)* ✓ *General Plan (Institutionalize hazard mitigation in land use, new construction and major renovations)* ✓ *National Flood Insurance Program* ✓ *Storm Water Management Plan* ✓ *Zoning Ordinance* ✓ *Strategic Plan 2015-2019*
Funding	Traditional and nontraditional sources	✓ *Once plan is approved, seek authority to use bonds, fees, loans, and taxes to finance projects* ✓ *Seek assistance from federal and state government, foundation, nonprofit, and private sources, such as Hazard Mitigation Grant Program* ✓ *Research and grant opportunities through U.S. Department of Housing and Urban Development, Community Development Block Grant*
Partnerships	Creative funding and initiatives	✓ *Community volunteers* ✓ *In-kind resources* ✓ *Public-private partnerships* ✓ *State support*
Partnerships	Advisory bodies and committees	✓ *Disaster Council* ✓ *Disaster Management Area Coordinator* ✓ *Safety Committee*

Q&A | ELEMENT A: PLANNING PROCESS | A4

Q: A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))

A: See **Use of Existing Data** below.

Use of Existing Data

The Planning Team gathered and reviewed existing data and plans during plan writing and specifically noted as "sources". Numerous electronic and hard copy documents were used to support the planning process:

- ✓ City of Signal Hill General Plan and Elements
- ✓ City of Long Beach Hazard Mitigation Plan (Draft 2016)
- ✓ County of Los Angeles All-Hazards Mitigation Plan (2014)
- ✓ California State Hazard Mitigation Plan (2013)
- ✓ HAZUS maps and reports
- ✓ Census data
- ✓ FEMA "How To" Mitigation Series (386-1 to 386-9)
- ✓ National Oceanic and Atmospheric Administration statistics
- ✓ Historic GIS maps and local inventory data
- ✓ Local Flood Insurance Rate Maps

Q&A | ELEMENT E: PLAN ADOPTION | E1

Q: E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))

A: See **Plan Adoption Process** below.

Plan Adoption Process

Adoption of the plan by the local governing body demonstrates the City's commitment to meeting mitigation goals and objectives. Governing body approval legitimizes the plan and authorizes responsible agencies to execute their responsibilities.

The City Council must adopt the Mitigation Plan before the Plan can be approved by FEMA.

In preparation for the public meeting with the City Council, the Planning Team prepared a Staff Report including an overview of the Planning Process, Risk Assessment, Mitigation Goals, and Mitigation Actions. The staff presentation concluded with a summary of the input received during the public review of the document. The meeting participants were encouraged to present their views and make suggestions on possible mitigation actions.

The City Council heard the item on October 10, 2017. The City Council voted unanimously to adopt the updated Mitigation Plan. The Resolution of adoption by the City Council is in the **Appendix**.

Plan Approval

FEMA lifted the Approvable Pending Adoption upon receipt of City Council Adoption and formally approved the Plan on January 8, 2018. A copy of the FEMA Letter of Approval and FEMA Review Tool are located in the **Appendix**.

Part II: RISK ASSESSMENT

Community Profile

Geography and the Environment

The City of Signal Hill is located approximately two miles north of the Pacific Ocean in southern Los Angeles County. Signal Hill consists of 2.2 square miles completely surrounded by the City of Long Beach. Regional access to the City is provided by freeways, especially Interstate 405 (I-405); arterial roadways; bus routes; a light rail line; two major seaports; and Long Beach Airport, which is located immediately northeast of Signal Hill.

According to the City's General Plan, the panoramic view from the crest of Signal Hill is truly one of the most beautiful in all of Southern California. Most spectacular is the view of the Pacific Ocean framed by the Palos Verdes Peninsula and the Sheep Hills at Newport Beach. This ocean view features rolling breakers at Huntington Beach, the Queen Mary and the Long Beach skyline arguably equally spectacular at night. To the northwest, Signal Hill vistas include the skyscrapers in downtown Los Angeles, the Hollywood sign and the Getty Museum of Art perched upon the Santa Monica Mountains. To the east the view is remarkably grand including the Long Beach Airport and the Pyramid at the California State University at Long Beach.

Most famous for the discovery of oil in 1921, and commonly known as an "oil town," the City is now a diverse community with an "oil history" and a bright future. By the turn of the 20th Century, stately mansions dotted the hilltop, as the value of the panoramic view became evident. However, by 1917 the prospect of striking oil on the hilltop surpassed the value of the view and the Union Oil Company drilled the first oil well in the area. The well failed to produce any oil and it was abandoned. Further exploration was suspended until the Royal Dutch Shell Oil Company resumed exploration and hit pay dirt on June 23, 1921. That first "gusher," at Alamitos Well #1, marked a turning point in Signal Hill's history and put the city on the map.

Ultimately one of the richest oil fields in the world, it produced over 1 billion barrels of oil by 1984. The field is still active and produced over 1.6 million barrels of oil in 1994 alone. Oil production continued to be Signal Hill's mainstay until declining oil prices reduced production in the 1970's. Today, Signal Hill is a well-balanced, financially sound and economically diverse community of over 11,673 people.

Climate

According to the City of Signal Hill's General Plan – Environmental Resources Element (1989), is located within a moderate climate of the South Coast Air Basin. The annual average temperature in the City ranges from the mid 50°F in winter to the mid 70°F in the summer. Freezing conditions and temperatures over 100°F occur infrequently.

The prevailing wind pattern is a daytime sea breeze, flowing toward the east and northeast with little seasonal variability. Nighttime winds are light, and although variable, often have an offshore character that flows toward the south/southwest. During the fall and early winter, Santa Ana wind conditions sometimes occur. These relatively strong winds flow from the mountains in the east toward the southwest in the vicinity of Signal Hill and generally increase local temperatures.

Annual precipitation varies, with long-term average of about 15.4 inches per year. Annual average relative humidity in January ranges from 50 to 75 percent daily, whereas in July it varies from 60 to 85 percent. As the State of California and the Los Angeles region has undergone a several-year drought, rainfall has been much lower in the City.

Furthermore, actual rainfall in the Southern California region tends to fall in large amounts during sporadic and often heavy storms rather than consistently over storms at somewhat regular intervals. In short rainfall in Southern California might be characterized as feast or famine within a single year.

Population and Demographics

According to the City's General Plan, in 1980, the City's population was approximately 5,734 residents. According to the California Department of Finance (2016), the population has grown to 11,673 as of 2016. From 2000 to 2016, the City has experienced an average growth rate of 1.4 percent annually. Similarly, the population of Los Angeles County experienced a growth rate of 0.4 percent per year.

According to the California Department of Finance (2014), the demographic makeup of the City is as follows:

Table: City of Signal Hill Demographics
(Source: California Department of Finance, E-5, 2014)

Racial/Ethnic Group	2000	2014	Change	Change %
White	2,828	3,184	356	13%
Black	1,213	1,483	270	22%
American Indian Eskimo	19	23	4	21%
Asian or Pacific Islander	1,876	2,510	634	34%
Other	457	468	11	2%
Total	9,333	11,411	2,078	22%
Hispanic	2,940	3,743	803	27%

Housing and Community Development

Table: City of Signal Hill Housing
(Source: California Department of Finance, E-5, 2016)

2014	Number	Percent %
Housing Type:		
1-unit, detached	1,423	31.7%
1-unit, attached	618	13.8%
2-4 Units	638	14%
5+ Units	1,852	40.5%
Mobile homes/Other	0	0 %
Housing Statistics:		
Total Available Housing Units	4,531	100 %
Owner-Occupied Housing	2,340	51.6 %
Renter-Occupied	2,191	48.4 %
Average Household Size:	2.7 persons	
Median Home Price:	$440,000	

Employment and Industry

According to the City's General Plan, Signal Hill has a large and growing retail and commercial services employment base. The major employers within the City include Office Depot, Costco, and the Oil Well Service Company.

Table: City of Signal Hill Industry
(Source: American Community Survey - 2014)

Industry	2014	
	Number	Percent %
Agriculture, forestry, fishing and hunting, and mining	33	0.6%
Construction	445	8.0%
Manufacturing	506	9.1%
Wholesale Trade	154	2.8%
Retail Trade	478	8.6%
Transportation and Warehousing, and Utilities	386	6.9%
Information	154	2.8%
Finance and insurance, and real estate and rental and leasing	339	6.1%
Professional, scientific, and management, and administrative and waste management services	908	16.2%
Educational services, and health care and social assistance	1,145	20.5%
Arts, entertainment, and recreation, and accommodation and food services	559	10.0%
Other services, except public administration	275	4.9%
Public administration	206	3.7%

Table: City of Signal Hill Occupation
(Source: American Community Survey - 2014)

Occupation	2014	
	Number	Percent
Civilian employed population (16 years and over)	5,588	38.5%
Management, business, science, and arts occupations	2,152	19.2%
Service occupations	1,074	26.9%
Sales and office occupations	1,503	6.4%
Natural resources, construction, and maintenance occupations	359	8.9%
Production, transportation, and material moving	500	38.5%

Transportation and Commuting Patterns

According to the City of Signal Hill's General Plan – Circulation Element (2009), Signal Hill is completely surrounded by the city of Long Beach, and its transportation network is intertwined with that of its neighbor. Regional access to the City as shown on **Map: Regional Access**, is provided by freeways, especially Interstate 405 (I-405); arterial roadways; bus routes; a light rail line; two major seaports; and Long Beach Airport, which is located immediately northeast of Signal Hill.

The existing Signal Hill transportation system consists of roads of varying sizes and capacities; public transportation systems, including bus, light rail, and paratransit service; airports, and seaports as shown on **Map: Roadway Classifications**. The network created by these systems serves two distinct and equally important functions: 1) to provide access to adjacent land uses, and 2) to facilitate the movement of persons and goods to, from, within, and through the City.

Interstate

The San Diego Freeway (Interstate 405 or I-405) crosses the northern portion of Signal Hill. The highway is owned and maintained by Caltrans. In the Signal Hill area, the I-405 currently consists of ten travel lanes, including eight mixed-flow and two carpool lanes.

Interstate 405 is one of the major access routes to Signal Hill but is also a major traffic generator that affects traffic flow within the City. The freeway interchanges with the Long Beach Freeway (I-710) approximately three miles northwest of Cherry Avenue, with the San Gabriel Freeway (I-605) approximately five miles southeast of Cherry Avenue, and with the Garden Grove Freeway (State Route 22 or SR-22) approximately 7.5 miles southeast of Cherry Avenue. Full freeway access is provided at Atlantic, Cherry, and Orange Avenues. Northbound I-405 access to the City for traffic oriented south on Cherry Avenue is provided at Temple Avenue. This circuitous access to Cherry Avenue increases traffic levels on Temple Avenue and Spring Street and is confusing to motorists.

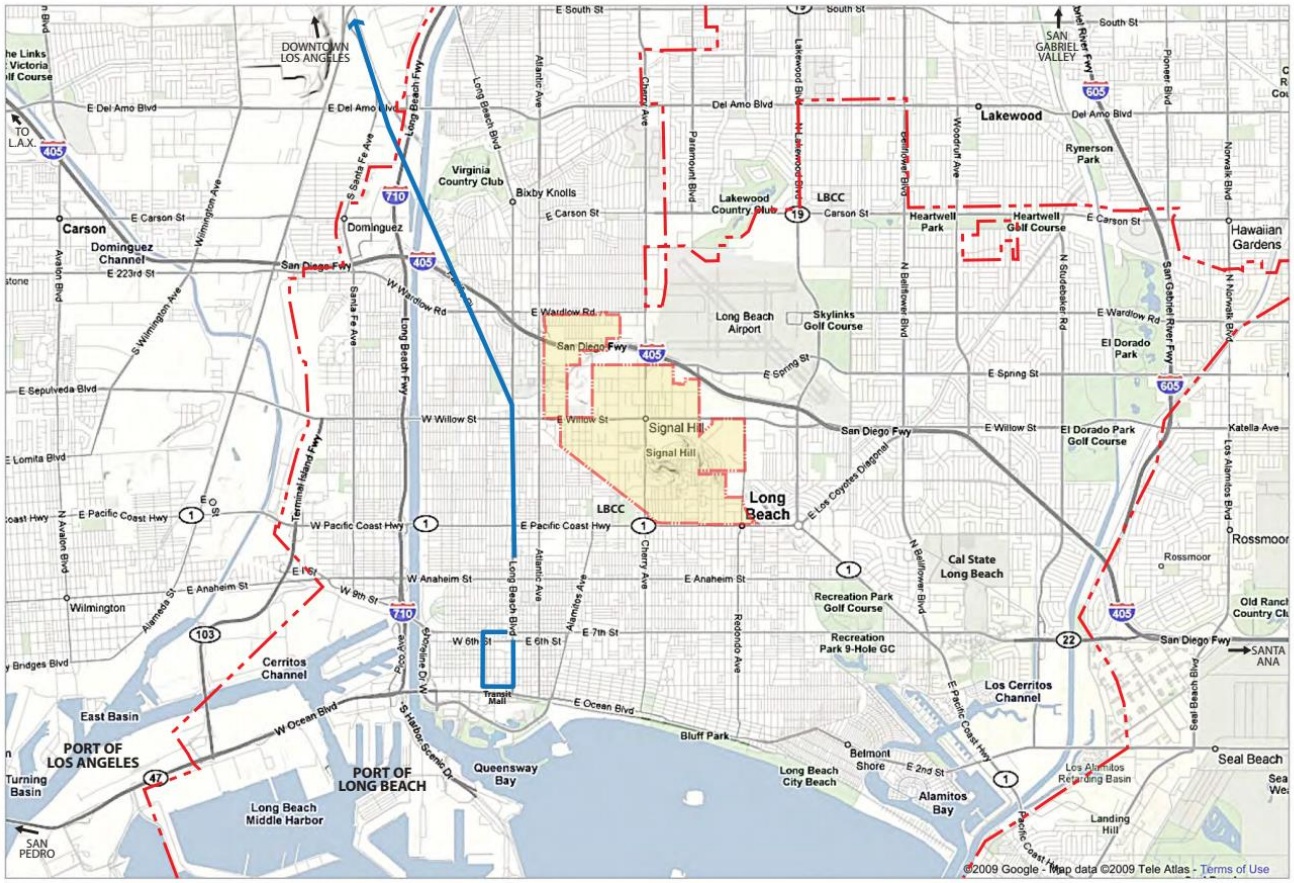
The 2003 Short-Range Transportation Plan (SRTP), prepared by the Metropolitan Transportation Authority (Metro), recognizes the I-405 as a "congested corridor" in the Signal Hill area, and identifies the Cherry and Atlantic Avenue ramps as "hot spots" with recurring heavy traffic congestion. These designations make this freeway corridor a higher priority for future improvements; however, no major improvements are currently funded.

Bus Service

Signal Hill is well-served by bus systems. Services provided by Long Beach Transit and Metro operate within or in the vicinity of the City; additional bus lines are accessible through the nearby Long Beach Transit Mall.

Long Beach Transit is the primary public transportation provider to Signal Hill. It is a municipal transit agency operated on behalf of the City of Long Beach by a nonprofit corporation, the Long Beach Public Transportation Company. In 2007, Long Beach Transit operated a total of 249 buses on 38 bus routes, providing over 26.6 million passenger trips. Service is provided from approximately 4:30 am to 1:30 am, seven days per week.

Map: Regional Access
(Source: City of Signal Hill General Plan – Circulation Element 2009)

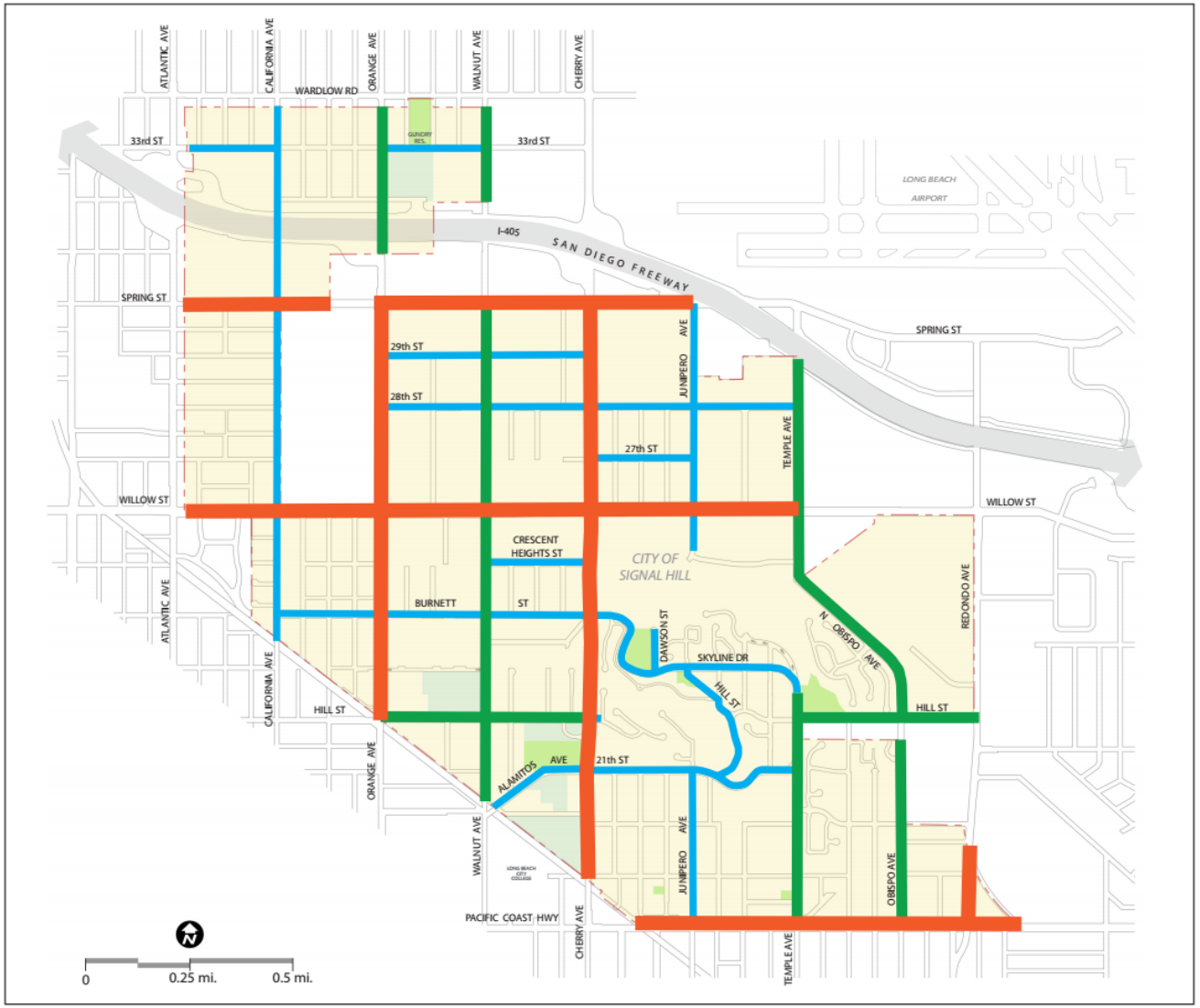


City of Signal Hill
GENERAL PLAN

Circulation Element
December 2009

City of Signal Hill Boundary
City of Long Beach Boundary
Metro Blue Line

Map: Roadway Classifications
(Source: City of Signal Hill General Plan – Circulation Element 2009)



City of Signal Hill
GENERAL PLAN

Circulation Element
December 2009

- Freeway
- Principal Arterial
- Minor Arterial
- Collector
- City of Signal Hill Boundary

Risk Assessment

What is a Risk Assessment?

Conducting a risk assessment can provide information regarding: the location of hazards; the value of existing land and property in hazard locations; and an analysis of risk to life, property, and the environment that may result from natural hazard events. Specifically, the five levels of a risk assessment are as follows:

1. *Hazard Identification*
2. *Profiling Hazard Events*
3. *Vulnerability Assessment/Inventory of Existing Assets*
4. *Risk Analysis*
5. *Assessing Vulnerability/Analyzing Development Trends*

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1

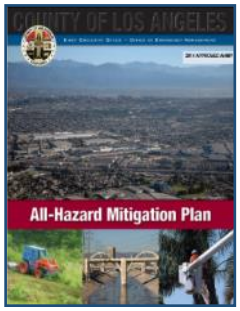
Q: B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))

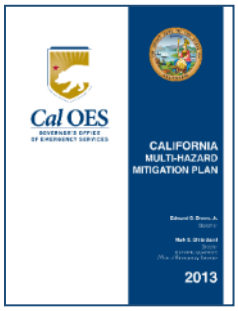
A: See **Hazard Identification** below.

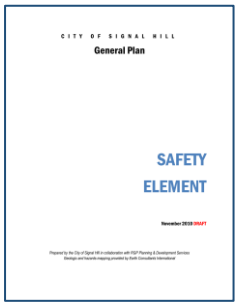
1) Hazard Identification

This section is the description of the geographic extent, potential intensity, and the probability of occurrence of a given hazard. Maps are used in this plan to display hazard identification data. ***The City of Signal Hill utilized the categorization of hazards as identified in California's State Hazard Mitigation Plan, including: Earthquakes, Floods, Levee failures, Wildfires, Landslides and earth movements, Tsunami, Climate-related hazards, Volcanoes, and Other hazards***.

Next, the Planning Team reviewed existing documents to determine which of these hazards posed the most significant threat to the City. In other words, which hazard would likely result in a local declaration of emergency.







The geographic extent of each of the identified hazards was identified by the Planning Team utilizing maps and data contained in the City's General Plan and City's Emergency Operations Plan. In addition, numerous internet resources and the County of Los Angeles All-Hazards Mitigation Plan served as valuable resources. Utilizing the Calculated Priority Risk Index (CPRI)

ranking technique, the Planning Team concluded the following hazards posed a significant threat against the City:

Earthquake | Landslide | Windstorm | Drought

The hazard ranking system is described in **Table: Calculated Priority Risk Index**, while the actual ranking is shown in **Table: Calculated Priority Risk Index Ranking for City of Signal Hill**.

Table: Calculated Priority Risk Index
(Source: Federal Emergency Management Agency)

CPRI Category	Degree of Risk			Assigned Weighting Factor
	Level ID	Description	Index Value	
Probability	Unlikely	Extremely rare with no documented history of occurrences or events. Annual probability of less than 1 in 1,000 years.	1	45%
	Possibly	Rare occurrences. Annual probability of between 1 in 100 years and 1 in 1,000 years.	2	
	Likely	Occasional occurrences with at least 2 or more documented historic events. Annual probability of between 1 in 10 years and 1 in 100 years.	3	
	Highly Likely	Frequent events with a well-documented history of occurrence. Annual probability of greater than 1 every year.	4	
Magnitude/ Severity	Negligible	Negligible property damages (less than 5% of critical and non-critical facilities and infrastructure. Injuries or illnesses are treatable with first aid and there are no deaths. Negligible loss of quality of life. Shut down of critical public facilities for less than 24 hours.	1	30%
	Limited	Slight property damage (greater than 5% and less than 25% of critical and non-critical facilities and infrastructure). Injuries or illnesses do not result in permanent disability, and there are no deaths. Moderate loss of quality of life. Shut down of critical public facilities for more than 1 day and less than 1 week.	2	
	Critical	Moderate property damage (greater than 25% and less than 50% of critical and non-critical facilities and infrastructure). Injuries or illnesses result in permanent disability and at least 1 death. Shut down of critical public facilities for more than 1 week and less than 1 month.	3	
	Catastrophic	Severe property damage (greater than 50% of critical and non-critical facilities and infrastructure). Injuries and illnesses result in permanent disability and multiple deaths. Shut down of critical public facilities for more than 1 month.	4	
Warning Time	> 24 hours	Population will receive greater than 24 hours of warning.	1	15%
	12–24 hours	Population will receive between 12-24 hours of warning.	2	
	6-12 hours	Population will receive between 6-12 hours of warning.	3	
	< 6 hours	Population will receive less than 6 hours of warning.	4	
Duration	< 6 hours	Disaster event will last less than 6 hours	1	10%
	< 24 hours	Disaster event will last less than 6-24 hours	2	
	< 1 week	Disaster event will last between 24 hours and 1 week.	3	
	> 1 week	Disaster event will last more than 1 week	4	

Table: Calculated Priority Risk Index Ranking for City of Signal Hill

Hazard	Probability	Weighted 45% (x.45)	Magnitude Severity	Weighted 30% (x.3)	Warning Time	Weighted 15% (x.15)	Duration	Weighted 10% (x.1)	CPRI Ranking
Earthquake – San Andreas M7.8	3	1.35	3	0.9	4	0.6	1	0.1	**2.95**
Earthquake – Newport-Inglewood M6.9	3	1.35	3	0.9	4	0.6	1	0.1	**2.95**
Earthquake – Puente Hills M7.1	3	1.35	3	0.9	4	0.6	1	0.1	**2.95**
Drought	4	1.80	1	0.3	1	0.15	4	0.4	**2.65**
Landslide	2	.90	2	0.6	4	0.6	1	0.1	**2.20**
Windstorm (excess of 50 mph)	1	.45	2	0.6	1	0.15	2	0.2	**1.40**

2) Profiling Hazard Events

This process describes the causes and characteristics of each hazard and what part of the City's facilities, infrastructure, and environment may be vulnerable to each specific hazard. A profile of each hazard discussed in this plan is provided in the City-Specific Hazard Analysis. **Table: Vulnerability: Location, Extent, and Probability for City of Signal Hill** indicates a generalized perspective of the community's vulnerability of the various hazards according to extent (or degree), location, and probability.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1

Q: B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))

A: See **Table: Vulnerability: Location, Extent, and Probability for City of Signal Hill** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2

Q: B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Table: Vulnerability: Location, Extent, and Probability for City of Signal Hill** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

Q: B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Table: Vulnerability: Location, Extent, and Probability for City of Signal Hill** below.

Table: Vulnerability: Location, Extent, and Probability for City of Signal Hill

Hazard	Location (Where)	Extent (How Big an Event)	Probability (How Often) *	Previous Occurrences
Earthquake	Entire Project Area	The Southern California Earthquake Center (SCEC) in 2007 concluded that there is a 99.7 % probability that an earthquake of M6.7 or greater will hit California within 30 years.[1]	Moderate	1994 – Northridge Earthquake
Landslide	Hillside areas surrounding Hilltop Park Undeveloped land areas on West side of City	Earthquake-induced and rain-induced landslide events possibly impacting dozens of structures.	Moderate	1995
Windstorm	Entire Project Area	50 miles per hour or greater.	Low	1996
Drought	Entire Project Area	Droughts in urban areas vary considerably in scope and intensity. Likely emergency water shortage regulations would restrict such activities as watering of landscape, washing of cars, and other non-safety related activities.	Moderate	Mild Drought Now
* Probability is defined as: Low = 1:1,000 years, Moderate = 1:100 years, High = 1:10 years				
[1] Uniform California Earthquake Rupture Forecast				

3) Vulnerability Assessment/Inventory of Existing Assets

A Vulnerability Assessment in its simplest form is a simultaneous look at the geographical location of hazards and an inventory of the underlying land uses (populations, structures, etc.). Facilities that provide critical and essential services following a major emergency are of particular concern because these locations house staff and equipment necessary to provide important public safety, emergency response, and/or disaster recovery functions.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

Q: B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Critical and Essential Facilities and Table: Critical and Essential Facilities Vulnerable to Hazards** below.

Critical and Essential Facilities

Facilities critical to government response activities (i.e., life safety and property and environmental protection) include: local government 9-1-1 dispatch centers, local government emergency operations centers, local police and fire stations, local public works facilities, local communications centers, schools (shelters), and hospitals. Also, facilities that, if damaged, could cause serious secondary impacts are also considered "critical". A hazardous materials facility is one example of this type of critical facility.

Essential facilities are those facilities that are vital to the continued delivery of key City services or that may significantly impact the City's ability to recover from the disaster. These facilities include but are not limited to: schools (hosting shelters); buildings such as the jail, law enforcement center, public services building, community corrections center, the courthouse, and juvenile services building and other public facilities.

Table: Critical and Essential Facilities Vulnerable to Hazards illustrates the critical and essential facilities within City of Signal Hill and the vulnerability of those facilities to the identified hazards.

Table: Critical and Essential Facilities Vulnerable to Hazards

Name of Facility	Earthquake	Landslide	Windstorm	Drought
City Hall 2175 Cherry Avenue	X		X	X
Los Angeles County Fire - Signal Hill Station 2300 E. 27th Street	X		X	X
Police Department / Emergency Operations Center 2745 Walnut Avenue	X		X	X
City Corporate Yard (Public Works) 2175 E. 28th Street	X		X	X

Community Center 1780 E. Hill Street	X		X	X
Hilltop Park 2351 Dawson Ave	X	X	X	X
Discovery Well Park 2200 Temple Ave	X	X	X	X
Signal Hill Elementary 2285 Walnut Avenue	X		X	X
Alvarado Elementary School 990 East 21st Street	X		X	X
Jessie E. Nelson Academy 1260 E. 33rd Street	X		X	X
Library 1770 East Hill Street	X		X	X

4) Risk Analysis

Estimating potential losses involves assessing the damage, injuries, and financial costs likely to be sustained in a geographic area over a given period of time. This level of analysis involves using mathematical models. The two measurable components of risk analysis are magnitude of the harm that may result and the likelihood of the harm occurring. Describing vulnerability in terms of dollar losses provides the community and the state with a common framework in which to measure the effects of hazards on assets. For each hazard where data was available, quantitative estimates for potential losses have been included in the hazard assessment. Data was not available to make vulnerability determinations in terms of dollar losses for all of the identified hazards. The **Mitigation Actions Matrix** includes an action item to conduct such an assessment in the future.

5) Assessing Vulnerability/ Analyzing Development Trends

This step provides a general description of City facilities and contents in relation to the identified hazards so that mitigation options can be considered in land use planning and future land use decisions. This Mitigation Plan provides comprehensive description of the character of the City of Signal Hill in the **Community Profile Section**. This description includes the geography and environment, population and demographics, land use and development, housing and community development, employment and industry, and transportation and commuting patterns. Analyzing these components of the City of Signal Hill can help in identifying potential problem areas and can serve as a guide for incorporating the goals and ideas contained in this mitigation plan into other community development plans.

Hazard assessments are subject to the availability of hazard-specific data. Gathering data for a hazard assessment requires a commitment of resources on the part of participating organizations and agencies. Each hazard-specific section of the plan includes a section on hazard identification using data and information from City, County, state, or federal sources.

Regardless of the data available for hazard assessments, there are numerous strategies the City can take to reduce risk. These strategies are described in the action items detailed in the Mitigation Actions Matrix in the **Mitigation Strategies Section**. Mitigation strategies can further reduce disruption to critical services, reduce the risk to human life, and alleviate damage to personal and public property and infrastructure.

Land and Development

The City of Signal Hill General Plan provides the framework for the growth and development of the City. This Plan is one of the City's most important tools in addressing environmental challenges including transportation and air quality; growth management; conservation of natural resources; clean water and open spaces.

According to the City's General Plan - Land Use Element (2001), Signal Hill's land use pattern is well established and it is not anticipated to change materially over time. New development will occur within the vacant oil field areas and to a lesser extent in-fill development is anticipated in established neighborhoods. Significant constraints to development of the "oil patch" will continue to limit the availability of development sites and the rate of development. These constraints include: ongoing oil field operations, steep slopes, unsuitable soils, environmental contamination, lack of existing utility systems or the need to upgrade existing systems, small lot

sizes, complex property ownership patterns, and a reluctance by traditional lending institutions to finance development of environmentally impacted properties.

Q&A | ELEMENT D: MITIGATION STRATEGY | D1

Q: D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))

A: See **Changes in Development** below

Changes in Development

Since the adoption of the 2012 Plan, there have been no significant alterations to the development pattern of the City in the hazard prone areas. This conclusion was reached after a thorough review of the General Plan and discussion with the Planning Team.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

Q: B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Table: Impacts to Existing and Future Land Uses in the City of Signal Hill** below.

Impacts to Types of Land Uses

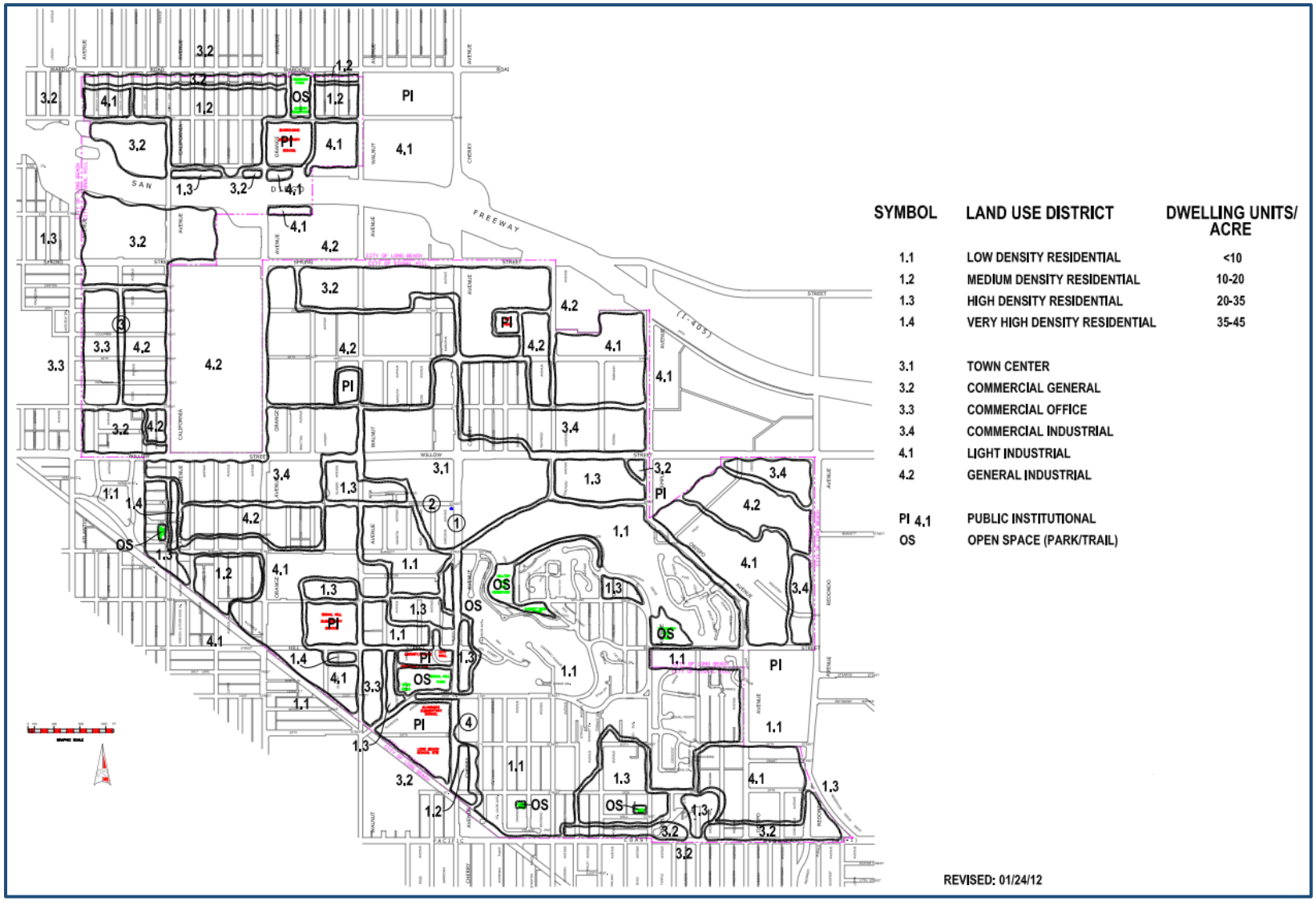
City of Signal Hill's General Plan identifies primarily residential land uses with other land uses consisting of commercial, industrial, public institutional, and open space.

Table: Impacts to Existing and Future Land Uses in the City of Signal Hill
(Source: EPC analysis based on City of Signal Hill General Plan – Land Use Element 2001)

Category of Land Use Designation	Acres (%)	Earthquake	Landslide	Windstorm	Drought
Low Density Residential	350 (24%)	X	X	X	X
Medium Density Residential	68 (5%)	X		X	X
High Density Residential	84 (6%)	X	X	X	X
Town Center	87 (6%)	X		X	X
Commercial General	179 (13%)	X		X	X
Commercial Office	25 (2%)	X	X	X	X

Commercial Industrial	151 11%)	X		X	X
Light Industrial	195 (14%)	X	X	X	X
General Industrial	192 (14%)	X	X	X	X
Public Institutional	35 (3%)	X	X	X	X
Open Space	24 (2%)	X	X	X	X

Map: Land Use Map
(Source: City of Signal Hill General Plan – Land Use Element, 2001



Earthquake Hazards

Previous Occurrences of Earthquakes in the City of Signal Hill

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2

Q: B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Previous Occurrences of Earthquakes in the City of Signal Hill** below.

The following earthquake events significantly impacted the region surrounding the City of Signal Hill.

In January 1994, the magnitude 6.7 Northridge Earthquake (thrust fault) which produced severe ground motion, caused 57 deaths, 9,253 injuries and left over 20,000 displaced. Scientists have stated that such devastating shaking should be considered the norm near any large thrust earthquake. Recent reports from scientists of the U.S. Geological Survey and the Southern California Earthquake Center say that the Los Angeles Area could expect one earthquake every year of magnitude 5.0 or more for the foreseeable future.

Since the writing of the 2012 Mitigation Plan, there have been no significant earthquake events in the City of Signal Hill.

Previous Occurrences of Earthquakes in Los Angeles County

Southern California has a history of powerful and relatively frequent earthquakes, dating back to the powerful magnitude 8.0+ 1857 San Andreas Earthquake which did substantial damage to the relatively few buildings that existed at the time.

Paleoseismological research indicates that large magnitude (8.0+) earthquakes occur on the San Andreas Fault at intervals between 45 and 332 years with an average interval of 140 years. Other lesser faults have also caused very damaging earthquakes since 1857. Notable earthquakes include the 1933 Long Beach Earthquake, the 1971 San Fernando Earthquake, the 1987 Whittier Earthquake and the 1994 Northridge Earthquake.

Local Conditions

According to the City of Signal Hill General Plan - Safety Element (2016), Signal Hill is located in a seismically active region, and major regional faults create the risk of substantial earth shaking and potential ground rupture in the area. Within Los Angeles County, there are over 50 active and potentially active fault segments, an undetermined number of buried faults, and at least 4 blind-thrust faults capable of producing damaging earthquakes.

Several active faults have been identified within close proximity or within the City boundaries which, most importantly, indicates that the community falls under the State Earthquake Fault Zoning Act and the State Hazards Mapping Act. These Acts require that local governments, in the general plan update process, adopt policies and criteria to ensure the structural adequacy of buildings erected across active faults for human occupancy. In some cases, the development of structures must be prohibited.

Earthquakes that could affect the City would most likely originate from the San Andreas, Newport-Inglewood, or Puente Hills Faults. These faults are close enough in proximity or expected to generate strong enough shaking that could affect the City.

San Andreas Fault Zone

The San Andreas Fault Zone is located approximately 40 miles northeast of the City of Signal Hill. This fault zone extends from the Gulf of California northward to the Cape Mendocino area where it continues northward along the ocean floor. The total length of the San Andreas Fault Zone is approximately 750 miles. The activity of the fault has been recorded during historic events, including the 1906 (M8.0) event in San Francisco and the 1857 (M7.9) event between Cholame and San Bernardino, where at least 250 miles of surface rupture occurred. These seismic events are among the most significant earthquakes in California history. Geologic evidence suggests that the San Andreas Fault has a 50 percent chance of producing a magnitude 7.5 to 8.5 quake (comparable to the great San Francisco earthquake of 1906) within the next 30 years.

Newport-Inglewood Fault Zone

Locally, the Newport-Inglewood Fault System cuts diagonally across Signal Hill as shown on **Map: Regional Faults**. This is the most significant seismic feature in the area and is considered seismically active. The 1933 Long Beach earthquake resulted from activity on this fault. Within the Newport-Inglewood Fault System, five faults have been identified in and in the immediate vicinity of Signal Hill: the Cherry Hill Fault, Pickler Fault, Northeast Flank Fault, Reservoir Hill Fault, and Wardlow Fault. These faults are generally in a northwest-to-southeast alignment. The Wardlow Fault is a pre-quaternary fault that has not ruptured in at least 2 million years, and is therefore considered inactive. All other faults are considered active.

The Newport-Inglewood Fault System is a nearly linear alignment of faults extending 45 miles along the southwestern side of the Los Angeles basin. It can be traced as a series of topographic hills, ridges, and mesas from the Santa Monica Mountains to Newport Beach, where it trends offshore. Structures along the zone of deformation act as groundwater barriers and, at greater depths, as petroleum traps. Continuing seismic activity has been evidenced most prominently in recent times by the 1920 Inglewood and 1933 Long Beach earthquakes.

Puente Hills Fault

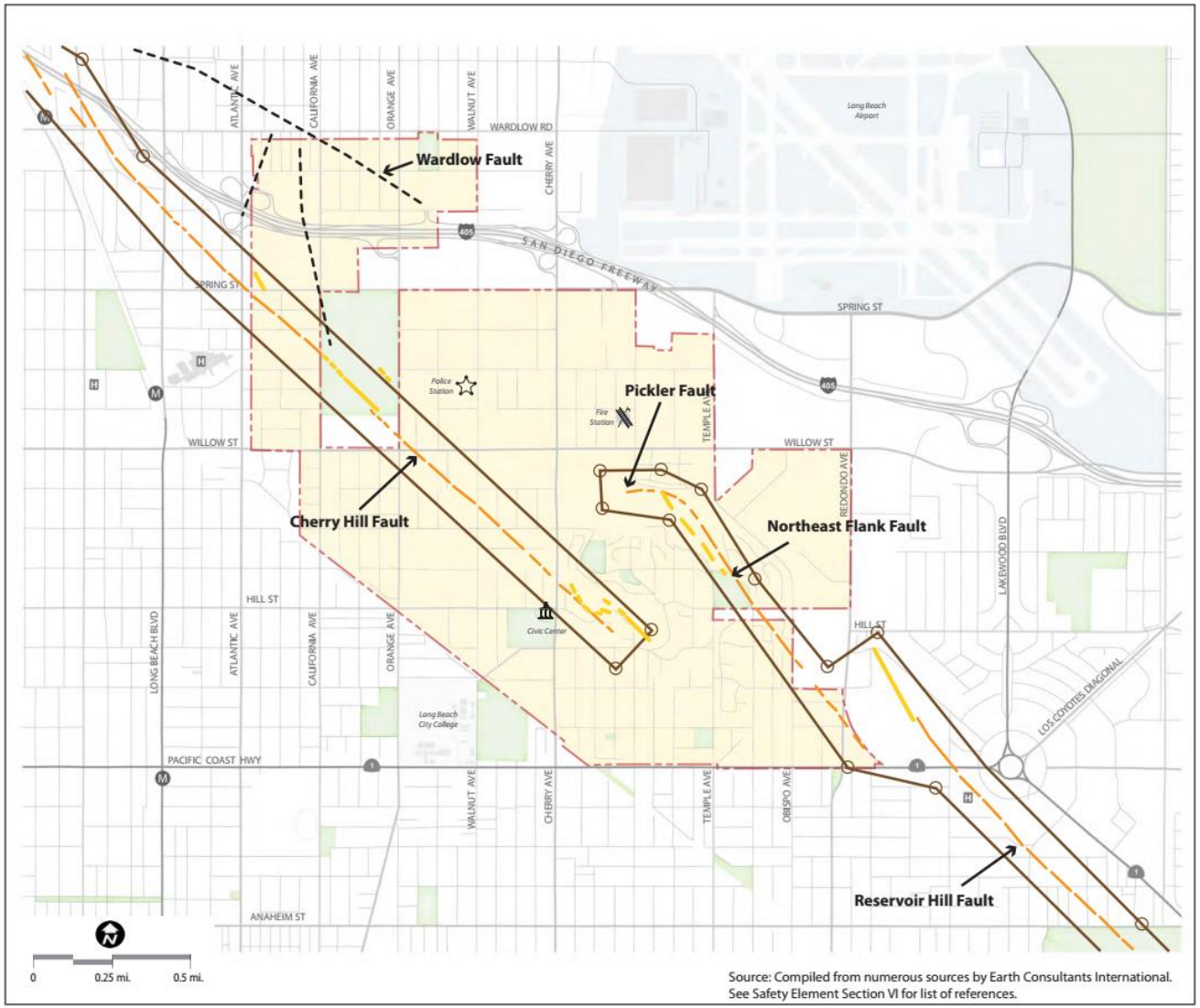
The Puente Hills fault is located approximately 15 miles northeast of the City. According to USGS, the Puente Hills Fault was most recently responsible for the M5.1 La Habra earthquake on March 28, 2014 which caused an estimated $2.6 million in damage. The USGS estimates that a future, larger M7.5 earthquake along the Puente Hills fault could kill 3,000 to 18,000 people and cause up to $250 billion in damage. In contrast, a larger M8.0 quake along the San Andreas would cause an estimated 1,800 deaths.

Whittier Fault

The Whittier Fault is a 25 mile right-lateral strike-slip fault that runs along the Chino Hills range between the cities of Chino Hills and Whittier. It is estimated that this fault could generate up to a magnitude 7.2 earthquake.

Map: Regional Faults
(Source: City of Signal Hill General Plan – Safety Element 2016)

Map: Local Faults
(Source: City of Signal Hill General Plan – Safety Element 2016)



City of Signal Hill
GENERAL PLAN

Safety Element
October 2010

- City of Signal Hill Boundary
- Active Faults
- Active and Potentially Active Fault Traces
- Pre-Quaternary Faults
- Alquist-Priolo Earthquake Fault Zones

Note:

All faults shown are part of the Newport-Inglewood Fault Zone.

This map is intended for general land use planning only. Information on this map is not sufficient to serve as a substitute for detailed geologic investigations of individual sites, nor does it satisfy the evaluation requirements set forth in geologic hazard regulations.

Fault lines on the map are used solely to approximate the fault location. The width and location of the fults should not be used in lieu of site-specific investigations, evaluation, and design. Detailed geologic investigations, including trenching studies, may make it possible to refine the location and activity status of a fault. Not all faults may be shown. This map may be amended as new data become available and are validated.

Pre-quaternary faults are considered inactive and are not subject to the requirements of the Alquist-Priolo Earthquake Faults Zoning Act.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

Q: B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Impact of Earthquakes in the City of Signal Hill** below.

Impact of Earthquakes in the City of Signal Hill

Based on the risk assessment, it is evident that earthquakes will continue to have potentially devastating economic impacts to certain areas of the City. Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life;
- ✓ Commercial and residential structural damage;
- ✓ Disruption of and damage to public infrastructure;
- ✓ Secondary health hazards e.g. mold and mildew;
- ✓ Damage to roads/bridges resulting in loss of mobility;
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community;
- ✓ Negative impact on commercial and residential property values; and
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.

Earthquake-Induced Landslides

Earthquake-induced landslides are secondary earthquake hazards that occur from ground shaking. They can destroy the roads, buildings, utilities, and other critical facilities necessary to respond and recover from an earthquake. Many communities in Southern California have a high likelihood of encountering such risks, especially in areas with steep slopes.

Map: Landslide and Liquefaction Zones shows the moderate risk of earthquake-induced landslide risk within the City. The areas found susceptible to landslides are found in the upper reaches of Signal Hill.

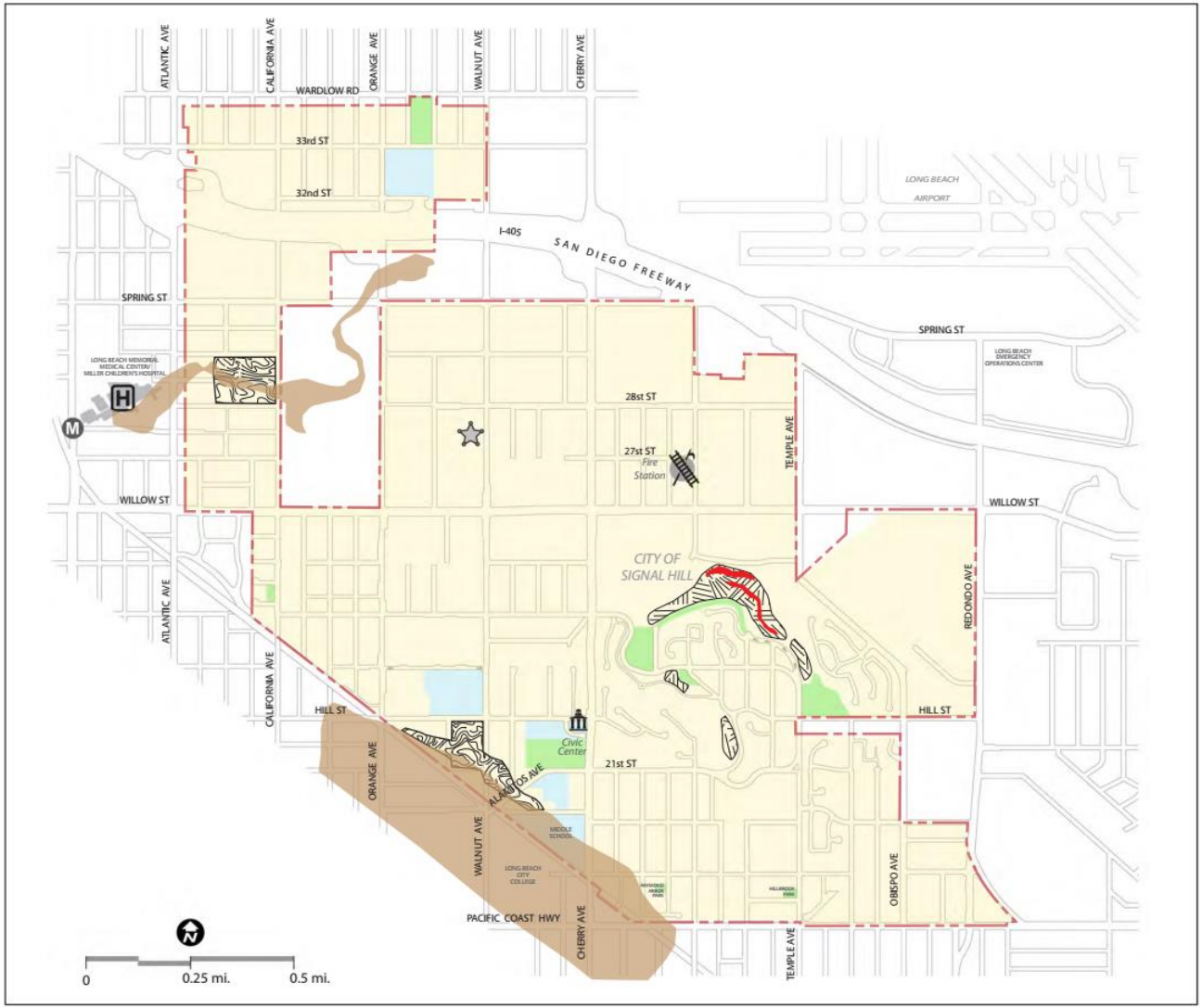
Liquefaction

Liquefaction is a phenomenon in which the strength and stiffness of a soil is reduced by earthquake shaking or other events. Liquefaction occurs in saturated soils, which are soils in which the space between individual soil particles is completely filled with water. This water exerts a pressure on the soil particles that influences how tightly the particles themselves are pressed together. Prior to an earthquake, the water pressure is relatively low. However, earthquake shaking can cause the water pressure to increase to the point where the soil particles can readily move with respect to each other. Because liquefaction only occurs in saturated soil, its effects are most commonly observed in low lying areas. Typically, liquefaction is associated with shallow groundwater, which is less than 50 feet beneath the earth's surface.

According to the City of Signal Hill General Plan - Safety Element (2016), only two small portions of the City are considered at risk from liquefaction. One area consists of a strip of land

adjacent to and under the Columbia Street right-of-way (part of which is currently used for oil production) between Atlantic and California Avenues. The second area is a narrow band along the southwestern border of the City, adjacent to the right-of-way of the former Pacific Electric Railway. Notably, this area of liquefaction risk includes a large portion of Chittick Field Park and Jessie Elwin Nelson Academy located at 1951 Cherry Avenue.

Map: Landslide and Liquefaction Zones
(Source: City of Signal Hill General Plan – Safety Element 2016)



City of Signal Hill
GENERAL PLAN

Safety Element
October 2010

City of Signal Hill Boundary

Liquefaction Hazard

Undeveloped Land with Liquefaction Potential

Landslide Movement Hazard

Undeveloped Land with Landslide Potential

Source: Prepared by Earth Consultants International with data from the California Division of Mines and Geology.

Exposure

The data in this section was generated using the HAZUS-MH program for earthquakes. Once the location and size of a hypothetical earthquake are identified, HAZUS-MH estimates the intensity of the ground shaking, the number of buildings damaged, the number of casualties, the amount of damage to transportation systems and utilities, the number of people displaced from their homes, and the estimated cost of repair and clean up.

Building Inventory

HAZUS estimates approximately 77% of the building stock within the City of Signal Hill is residential housing. In term of building construction types found in the region, wood frame construction makes up 79% of the building inventory.

Critical Facility Inventory

HAZUS breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

Table: Critical Facility Inventory – HAZUS

Essential Facilities	Count
Hospitals	1
Schools	3
Fire Stations	1
Police Stations	1
Emergency Operations Facilities	1

High Potential Loss (HPL) Facilities	Count
Dams	0
Levees	0
Military Installations	0
Nuclear Power Plants	0
Hazardous Material Sites	7

Transportation and Utility Lifeline Inventory

Within HAZUS, the lifeline inventory is divided between transportation and utility lifeline systems. Transportation systems include highways, railways, light rail, bus, ports, ferry and airports. Utility systems include potable water, wastewater, natural gas, crude & refined oil, electric power and communications.

Casualties

HAZUS estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows:

- ✓ **Severity Level 1:** Injuries will require medical attention but hospitalization is not needed.
- ✓ **Severity Level 2:** Injuries will require hospitalization but are not considered life-threatening
- ✓ **Severity Level 3:** Injuries will require hospitalization and can become life threatening if not promptly treated.
- ✓ **Severity Level 4:** Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Building-Related Losses

Building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

HAZUS Earthquake Event Summary Results

Newport-Inglewood M7.1 Earthquake Scenario

Building Damage

Table: Expected Building Damage by Occupancy – Newport-Inglewood M7.1

	None	Slight	Moderate	Extensive	Complete
	Count	Count	Count	Count	Count
Agriculture	1	3	3	2	1
Commercial	48	89	155	110	53
Education	2	2	3	1	1
Government	1	1	1	1	0
Industrial	17	33	66	50	26
Other Residential	70	129	99	29	12
Religion	3	5	7	5	2
Single Family	466	884	585	77	22
Total	**608**	**1,146**	**919**	**275**	**117**

Table: Expected Building Damage by Building Type – Newport-Inglewood M7.1

	None	Slight	Moderate	Extensive	Complete
	Count	Count	Count	Count	Count
Wood	543	1,038	701	98	30
Steel	12	21	53	45	22
Concrete	14	28	40	29	14
Precast	11	23	56	45	23
RM	26	30	56	44	16
URM	2	5	12	11	11
MH	0	0	1	2	1
Total	**608**	**1,146**	**919**	**275**	**117**

Transportation and Utility Lifeline Damage

Table: Expected Utility System Pipeline Damage – Newport-Inglewood M7.1

System	Total Pipelines (Length km)	Number of Leaks	Number of Breaks
Potable Water	468	215	54
Waste Water	281	154	38
Natural Gas	187	44	11
Oil	0	0	0

Table: Potable Water and Electric Power System Performance – Newport-Inglewood M7.1

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	**4,173**	1,176	0	0	0	0
Electric Power		3,355	2,303	1,097	246	4

Shelter Requirement

HAZUS estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 327 households to be displaced due to the earthquake. Of these, 201 people (out of a total population of 11,411) will seek temporary shelter in public shelters.

Casualties

The table below represents a summary of casualties estimated for Newport-Inglewood M7.1 earthquake scenario.

Table: Casualty Estimates – Newport-Inglewood M7.1

Time	Sector	Level 1	Level 2	Level 3	Level 4
2AM	Commercial	1	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	1	0	0	0
	Other-Residential	22	6	1	2
	Single-Family	13	2	0	0
	TOTAL	**37**	**8**	**1**	**2**
2PM	Commercial	64	19	3	6
	Commuting	0	0	1	0
	Educational	19	5	1	2
	Hotels	0	0	0	0
	Industrial	10	3	0	1
	Other-Residential	4	1	0	0
	Single-Family	3	0	0	0
	TOTAL	**100**	**29**	**5**	**9**
5PM	Commercial	45	13	2	4
	Commuting	5	6	11	2
	Educational	2	1	0	0
	Hotels	0	0	0	0
	Industrial	6	2	0	1
	Other-Residential	8	2	0	1
	Single-Family	5	1	0	0
	TOTAL	**72**	**24**	**14**	**8**

Economic Losses

The total economic loss estimated for the Newport-Inglewood M7.1 earthquake scenario is **$392.59 million dollars** which includes building and lifeline related losses based on the region's available inventory. The following tables provide more detailed information about these losses.

Table: Building-Related Economic Losses ($ Dollars) – Newport-Inglewood M7.1

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses	Wage	$0	$260,000	$12,040,000	$760,000	$360,000	$13,420,000
	Capital-Related	$0	$110,000	$9,620,000	$490,000	$80,000	$10,300,000
	Rental	$1,020,000	$3,120,000	$8,680,000	$240,000	$110,000	$13,170,000
	Relocation	$3,920,000	$2,200,000	$13,010,000	$1,310,000	$1,180,000	$21,620,000
	Subtotal	**$4,940,000**	**$5,690,000**	**$43,340,000**	**$2,800,000**	**$1,730,000**	**$58,500,000**
Capital Stock Losses	Structural	$7,980,000	$5,450,000	$29,170,000	$6,810,000	$1,930,000	$51,340,000
	Non-Structural	$41,020,000	$38,890,000	$80,060,000	$25,550,000	$6,260,000	$191,780,000
	Content	$13,820,000	$10,210,000	$39,430,000	$16,410,000	$3,150,000	$83,010,000
	Inventory	$0	$0	$1,350,000	$2,480,000	$40,000	$3,870,000
	Subtotal	**$62,820,000**	**$54,550,000**	**$150,010,000**	**$51,240,000**	**$11,380,000**	**$330,000,000**
	TOTAL	**$67,760,000**	**$60,240,000**	**$193,350,000**	**$54,040,000**	**$13,110,000**	**$388,500,000**

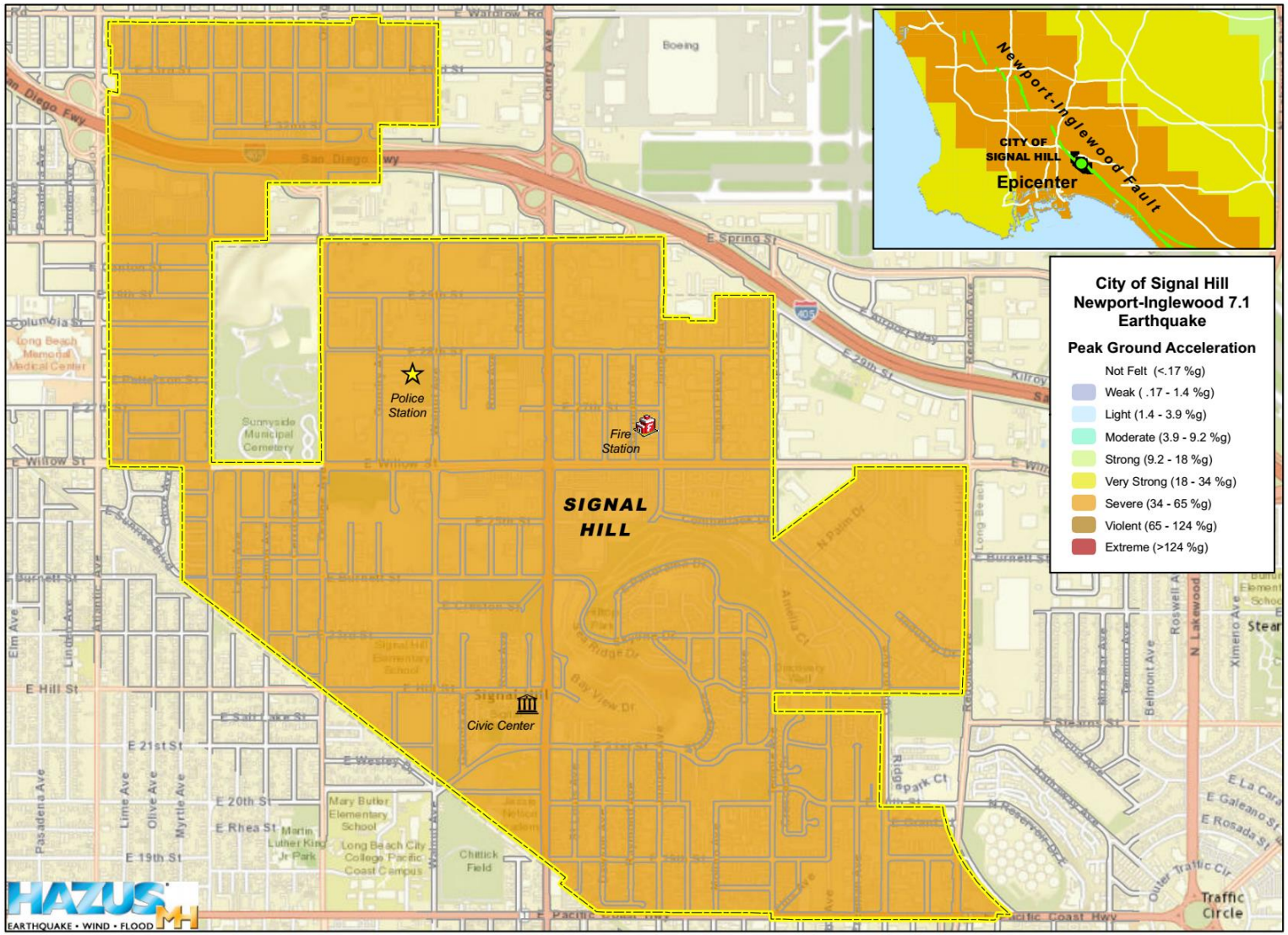
Table: Transportation System Economic Losses ($ Dollars) – Newport-Inglewood M7.1

System	Component	Total Inventory Value	Economic Loss	Loss Ratio %
Highway	Segments	$49,000,000	$0	0%
	Bridges	$10,490,000	$2,000,000	19%
	Tunnels	$0	$0	0%
Railways	Segments	$5,030,000	$0	0%
	Bridges	$0	$0	0%
	Tunnels	$0	$0	0%
	Facilities	$0	$0	0%
Light Rail	Segments	$0	$0	0%
	Bridges	$0	$0	0%
	Tunnels	$0	$0	0%
	Facilities	$0	$0	0%
Bus	Facilities	$0	$0	0%
Ferry	Facilities	$0	$0	0%
Port	Facilities	$0	$0	0%
Airport	Facilities	$0	$0	0%
	TOTAL	**$64,520,000**	**$2,000,000**	

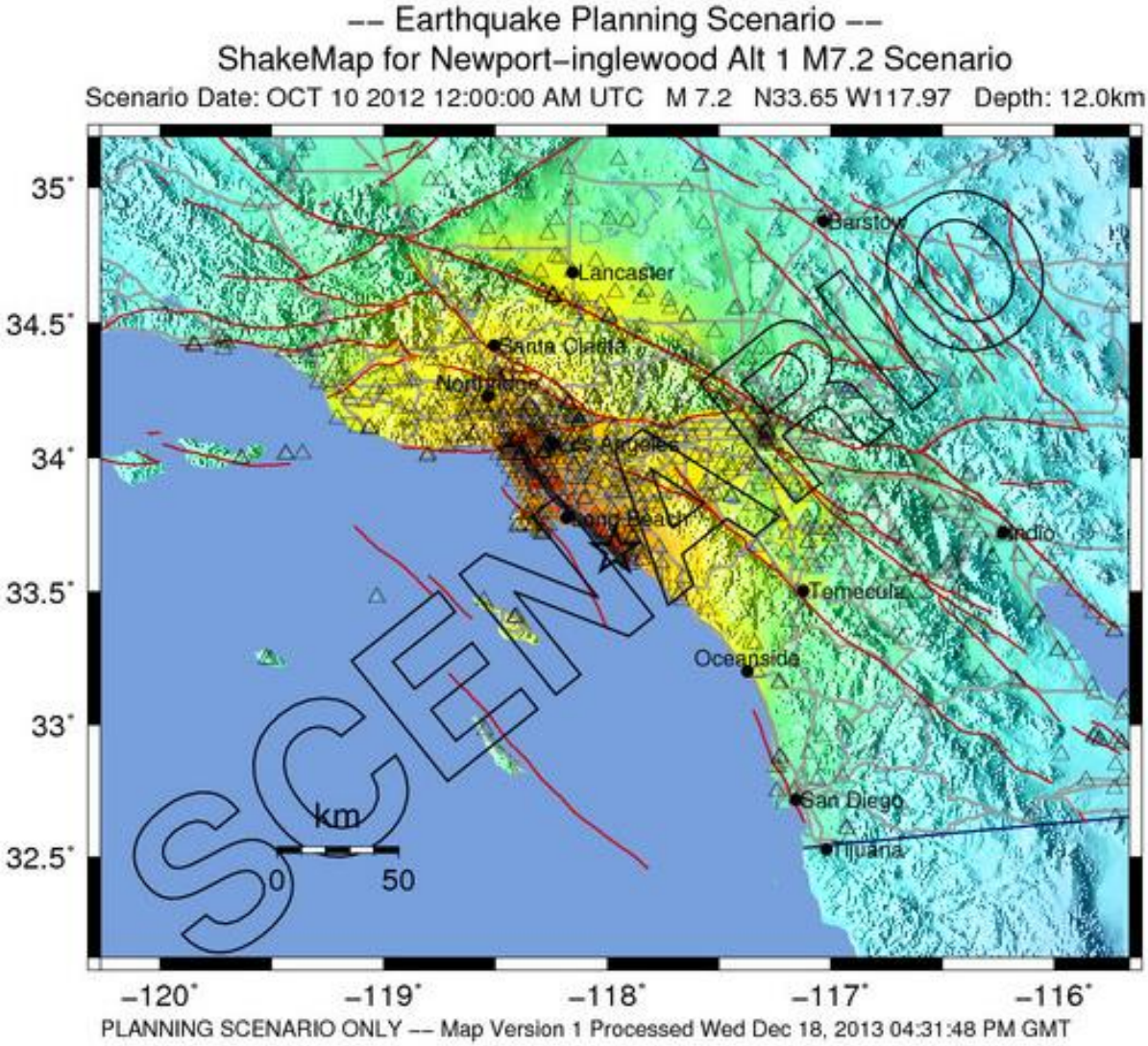
Table: Utility System Economic Losses ($ Dollars) – Newport-Inglewood M7.1

System	Component	Total Inventory Value	Economic Loss	Loss Ratio %
Potable Water	Pipelines	$0	$0	0%
	Facilities	$0	$0	0%
	Distribution Lines	$9,400,000	$970,000	10%
Waste Water	Pipelines	$0	$0	0%
	Facilities	$0	$0	0%
	Distribution Lines	$5,600,000	$690,000	12%
Natural Gas	Pipelines	$0	$0	0%
	Facilities	$0	$0	0%
	Distribution Lines	$3,700,000	$200,000	5%
Oil Systems	Pipelines	$0	$0	0%
	Facilities	$500,000	$180,000	39%
Electrical Power	Facilities	$0	$0	0%
Communication	Facilities	$100,000	$50,000	50%
	TOTAL	**$19,300,000**	**$2,090,000**	

Map: Shake Intensity Map – Newport-Inglewood M7.1
(Source: Emergency Planning Consultants)



Map: Seismic Shaking Intensities for the Newport-Inglewood M7.2
(Source: State of California Department of Conservation)



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	*<0.1*	*0.5*	*2.4*	*6.7*	*13*	24	44	83	>156
PEAK VEL.(cm/s)	<0.07	0.4	1.9	5.8	*11*	*22*	*43*	*83*	*>160*
INSTRUMENTAL INTENSITY	I	II–III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Wald, et al.; 1999

San Andreas M8.0 Earthquake Scenario

Building Damage

Table: Expected Building Damage by Occupancy – San Andreas M8.0

	None	Slight	Moderate	Extensive	Complete
	Count	Count	Count	Count	Count
Agriculture	9	1	0	0	0
Commercial	416	30	7	1	0
Education	8	0	0	0	0
Government	4	0	0	0	0
Industrial	168	16	7	1	0
Other Residential	326	11	1	0	0
Religion	20	1	0	0	0
Single Family	1,975	60	0	0	0
Total	**2,927**	**119**	**16**	**2**	**0**

Table: Expected Building Damage by Building Type – San Andreas M8.0

	None	Slight	Moderate	Extensive	Complete
	Count	Count	Count	Count	Count
Wood	2,334	75	1	0	0
Steel	127	15	9	2	0
Concrete	115	9	2	0	0
Precast	144	11	2	0	0
RM	167	4	1	0	0
URM	36	4	0	0	0
MH	3	1	0	0	0
Total	**2,927**	**119**	**16**	**2**	**0**

Transportation and Utility Lifeline Damage

Table: Expected Utility System Pipeline Damage – San Andreas M8.0

System	Total Pipelines (Length km)	Number of Leaks	Number of Breaks
Potable Water	468	502	126
Waste Water	281	360	90
Natural Gas	187	103	26
Oil	0	0	0

Table: Potable Water and Electric Power System Performance – San Andreas M8.0

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	**4,173**	3,405	2,237	0	0	0
Electric Power		0	0	0	0	0

Shelter Requirement

HAZUS estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 11,411) will seek temporary shelter in public shelters.

Casualties

The table below represents a summary of casualties estimated for San Andreas M8.0 earthquake scenario.

Table: Casualty Estimates – San Andreas M8.0

Time	Sector	Level 1	Level 2	Level 3	Level 4
2AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single-Family	0	0	0	0
	TOTAL	**0**	**0**	**0**	**0**
2PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single-Family	1	0	0	0
	TOTAL	**1**	**0**	**0**	**0**
5PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single-Family	1	0	0	0
	TOTAL	**1**	**0**	**0**	**0**

Economic Losses

The total economic loss estimated for the San Andreas M8.0 earthquake scenario is **$11.79 million dollars** which includes building and lifeline related losses based on the region's available inventory. The following tables provide more detailed information about these losses.

Table: Building-Related Economic Losses ($ Dollars) – San Andreas M8.0

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses	Wage	$0	$0	$280,000	$30,000	$10,000	$310,000
	Capital-Related	$0	$0	$200,000	$20,000	$0	$220,000
	Rental	$0	$10,000	$150,000	$10,000	$0	$180,000
	Relocation	$0	$10,000	$180,000	$60,000	$20,000	$260,000
	Subtotal	**$0**	**$30,000**	**$800,000**	**$110,000**	**$30,000**	**$980,000**
Capital Stock Losses	Structural	$80,000	$40,000	$360,000	$220,000	$40,000	$740,000
	Non-Structural	$630,000	$560,000	$1,680,000	$700,000	$140,000	$3,710,000
	Content	$240,000	$170,000	$940,000	$400,000	$70,000	$1,820,000
	Inventory	$0	$0	$30,000	$60,000	$0	$90,000
	Subtotal	**$940,000**	**$780,000**	**$3,020,000**	**$1,380,000**	**$240,000**	**$6,360,000**
	TOTAL	**$950,000**	**$800,000**	**$3,820,000**	**$1,490,000**	**$280,000**	**$7,340,000**

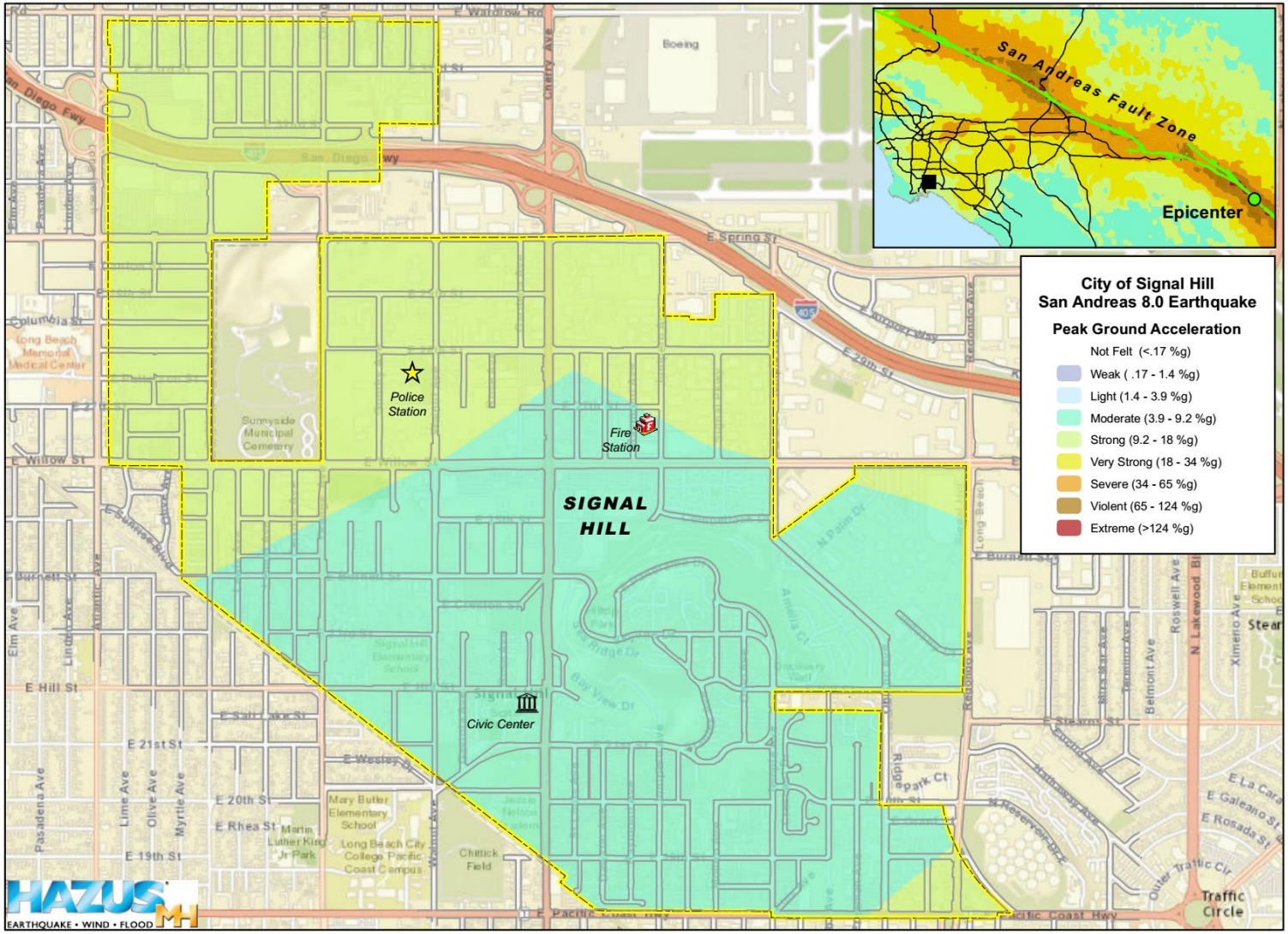
Table: Transportation System Economic Losses ($ Dollars) – San Andreas M8.0

System	Component	Total Inventory Value	Economic Loss	Loss Ratio %
Highway	Segments	$49,000,000	$0	0%
	Bridges	$10,490,000	$90,000	1%
	Tunnels	$0	$0	0%
Railways	Segments	$5,030,000	$0	0%
	Bridges	$0	$0	0%
	Tunnels	$0	$0	0%
	Facilities	$0	$0	0%
Light Rail	Segments	$0	$0	0%
	Bridges	$0	$0	0%
	Tunnels	$0	$0	0%
	Facilities	$0	$0	0%
Bus	Facilities	$0	$0	0%
Ferry	Facilities	$0	$0	0%
Port	Facilities	$0	$0	0%
Airport	Facilities	$0	$0	0%
	TOTAL	**$64,520,000**	**$90,000**	

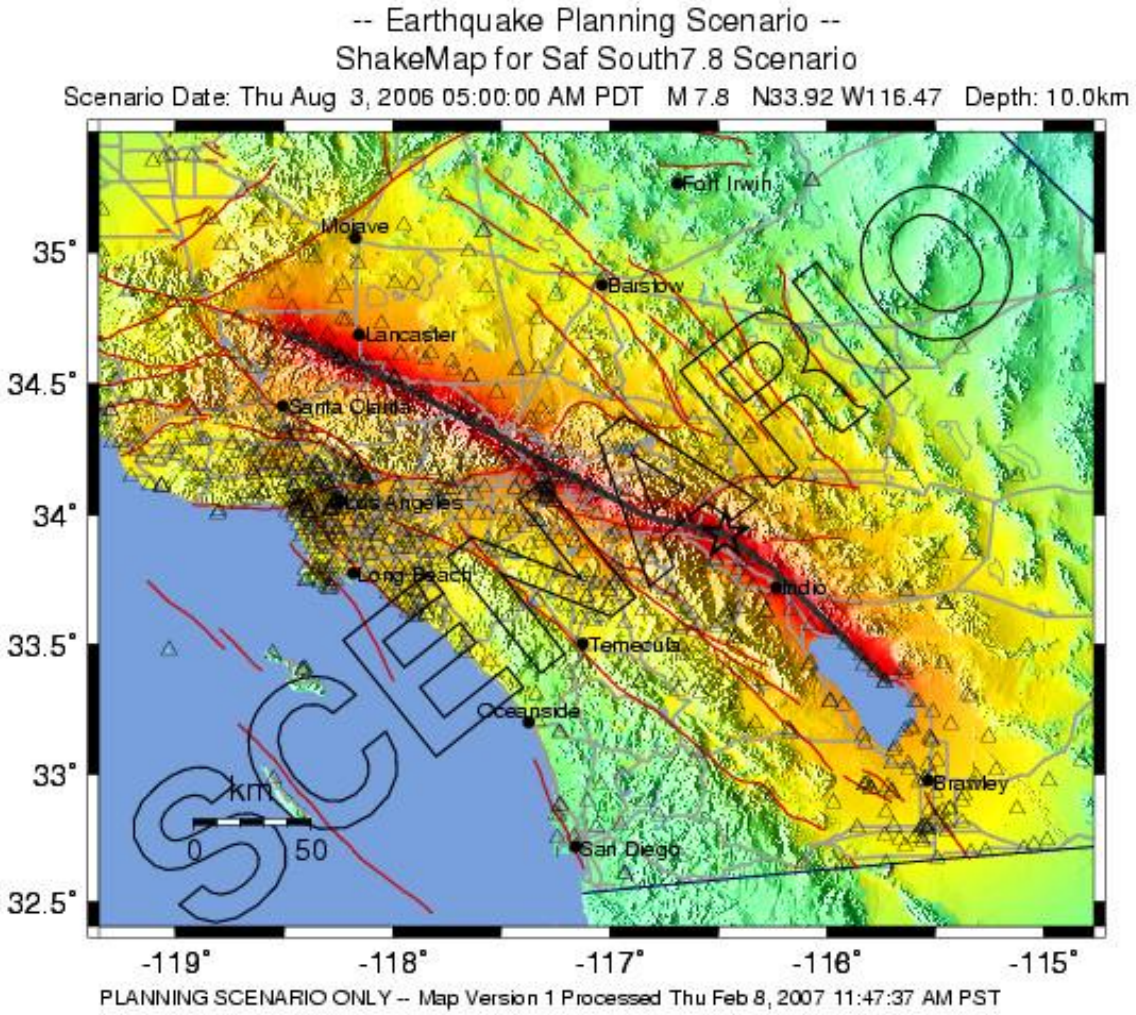
Table: Utility System Economic Losses ($ Dollars) – San Andreas M8.0

System	Component	Total Inventory Value	Economic Loss	Loss Ratio %
Potable Water	Pipelines	$0	$0	0%
	Facilities	$0	$0	0%
	Distribution Lines	$9,400,000	$2,260,000	24%
Waste Water	Pipelines	$0	$0	0%
	Facilities	$0	$0	0%
	Distribution Lines	$5,600,000	$1,620,000	29%
Natural Gas	Pipelines	$0	$0	0%
	Facilities	$0	$0	0%
	Distribution Lines	$3,700,000	$460,000	12%
Oil Systems	Pipelines	$0	$0	0%
	Facilities	$500,000	$10,000	2%
Electrical Power	Facilities	$0	$0	0%
Communication	Facilities	$100,000	$0	0%
	TOTAL	**$19,300,000**	**$4,350,000**	

Map: Shake Intensity Map – San Andreas M8.0
(Source: Emergency Planning Consultants)



Map: Seismic Shaking Intensities for the San Andrea Fault M7.8
(Source: State of California Department of Conservation)



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	*<.17*	*.17-1.4*	*1.4-3.9*	*3.9-9.2*	*9.2-18*	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	*8.1-16*	*16-31*	*31-60*	*60-116*	*>116*
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Puente Hills M7.1 Earthquake Scenario

Building Damage

Table: Expected Building Damage by Occupancy – Puente Hills M7.1

	None	Slight	Moderate	Extensive	Complete
	Count	Count	Count	Count	Count
Agriculture	5	3	2	1	0
Commercial	202	114	99	33	6
Education	5	2	1	0	0
Government	2	1	1	0	0
Industrial	79	47	46	17	4
Other Residential	186	106	38	7	1
Religion	11	6	4	1	0
Single Family	1,163	682	178	9	2
Total	**1,653**	**961**	**369**	**69**	**14**

Table: Expected Building Damage by Building Type – Puente Hills M7.1

	None	Slight	Moderate	Extensive	Complete
	Count	Count	Count	Count	Count
Wood	1,365	810	220	13	3
Steel	58	36	42	15	3
Concrete	56	33	25	10	2
Precast	64	37	39	14	2
RM	94	33	31	12	1
URM	15	11	10	4	1
MH	1	1	2	1	0
Total	**1,653**	**961**	**369**	**69**	**14**

Transportation and Utility Lifeline Damage

Table: Expected Utility System Pipeline Damage – Puente Hills M7.1

System	Total Pipelines (Length km)	Number of Leaks	Number of Breaks
Potable Water	468	61	15
Waste Water	281	44	11
Natural Gas	187	13	3
Oil	0	0	0

Table: Potable Water and Electric Power System Performance – Puente Hills M7.1

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	**4,173**	0	0	0	0	0
Electric Power		0	0	0	0	0

Shelter Requirement

HAZUS estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 63 households to be displaced due to the earthquake. Of these, 38 people (out of a total population of 11,411) will seek temporary shelter in public shelters.

Casualties

The table below represents a summary of casualties estimated for the Puente Hills M7.1 earthquake scenario.

Table: Casualty Estimates – Puente Hills M7.1

Time	Sector	Level 1	Level 2	Level 3	Level 4
2AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	4	1	0	0
	Single-Family	3	0	0	0
	TOTAL	**7**	**1**	**0**	**0**
2PM	Commercial	12	3	0	1
	Commuting	0	0	0	0
	Educational	4	1	0	0
	Hotels	0	0	0	0
	Industrial	2	0	0	0
	Other-Residential	1	0	0	0
	Single-Family	1	0	0	0
	TOTAL	**19**	**4**	**0**	**1**
5PM	Commercial	8	2	0	0
	Commuting	1	1	2	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	1	0	0	0
	Other-Residential	2	0	0	0
	Single-Family	1	0	0	0
	TOTAL	**14**	**3**	**2**	**0**

Economic Losses

The total economic loss estimated for the Puente Hills M7.1 scenario earthquake is **$113.03 million dollars** which includes building and lifeline related losses based on the region's available inventory. The following tables provide more detailed information about these losses.

Table: Building-Related Economic Losses ($ Dollars) – Puente Hills M7.1

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses	Wage	$0	$70,000	$3,640,000	$240,000	$120,000	$4,070,000
	Capital-Related	$0	$30,000	$2,820,000	$150,000	$20,000	$3,020,000
	Rental	$260,000	$10,000	$2,840,000	$90,000	$30,000	$4,050,000
	Relocation	$950,000	$600,000	$4,310,000	$530,000	$350,000	$6,740,000
	Subtotal	**$1,210,000**	**$1,530,000**	**$13,610,000**	**$1,010,000**	**$520,000**	**$17,880,000**
Capital Stock Losses	Structural	$2,260,000	$1,510,000	$8,100,000	$2,080,000	$550,000	$14,500,000
	Non-Structural	$12,730,000	$11,320,000	$21,740,000	$7,150,000	$1,760,000	$54,700,000
	Content	$4,390,000	$3,040,000	$10,980,000	$4,560,000	$900,000	$23,870,000
	Inventory	$0	$0	$370,000	$690,000	$10,000	$1,070,000
	Subtotal	**$19,380,000**	**$15,870,000**	**$41,190,000**	**$14,480,000**	**$3,220,000**	**$94,140,000**
TOTAL		**$20,590,000**	**$17,400,000**	**$54,800,000**	**$15,490,000**	**$3,740,000**	**$112,020,000**

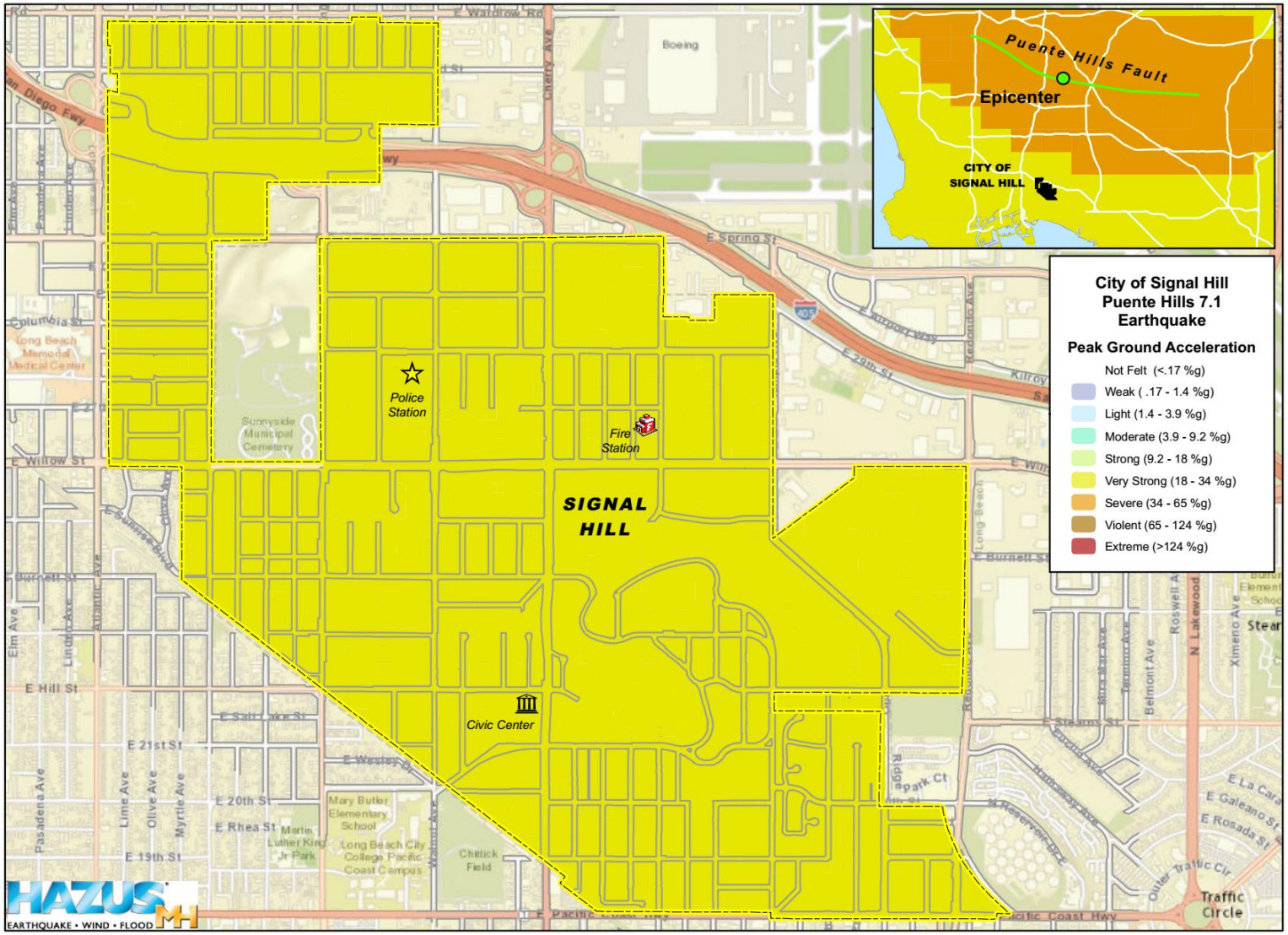
Table: Transportation System Economic Losses ($ Dollars) – Puente Hills M7.1

System	Component	Total Inventory Value	Economic Loss	Loss Ratio %
Highway	Segments	$49,000,000	$0	0%
	Bridges	$10,490,000	$390,000	4%
	Tunnels	$0	$0	0%
Railways	Segments	$5,030,000	$0	0%
	Bridges	$0	$0	0%
	Tunnels	$0	$0	0%
	Facilities	$0	$0	0%
Light Rail	Segments	$0	$0	0%
	Bridges	$0	$0	0%
	Tunnels	$0	$0	0%
	Facilities	$0	$0	0%
Bus	Facilities	$0	$0	0%
Ferry	Facilities	$0	$0	0%
Port	Facilities	$0	$0	0%
Airport	Facilities	$0	$0	0%
	TOTAL	**$64,520,000**	**$390,000**	

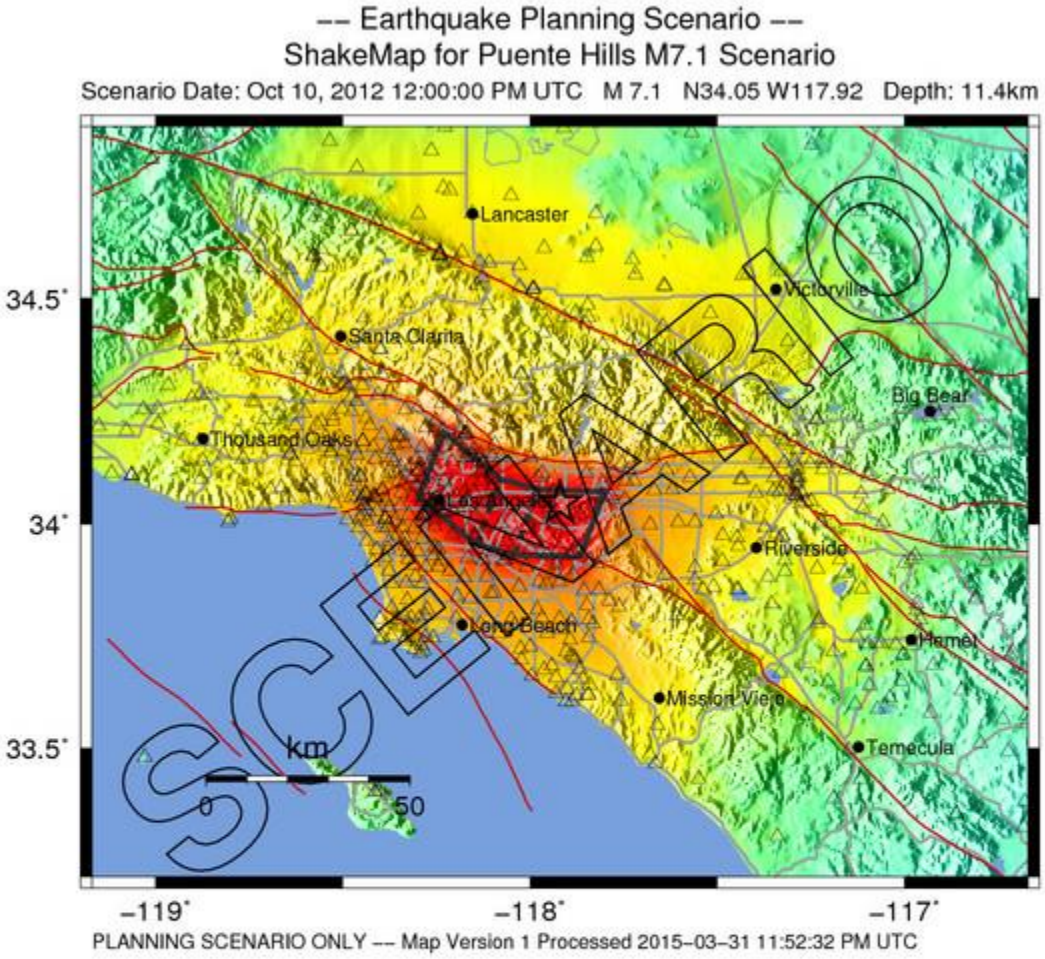
Table: Utility System Economic Losses ($ Dollars) – Puente Hills M7.1

System	Component	Total Inventory Value	Economic Loss	Loss Ratio %
Potable Water	Pipelines	$0	$0	0%
	Facilities	$0	$0	0%
	Distribution Lines	$9,400,000	$280,000	3%
Waste Water	Pipelines	$0	$0	0%
	Facilities	$0	$0	0%
	Distribution Lines	$5,600,000	$200,000	4%
Natural Gas	Pipelines	$0	$0	0%
	Facilities	$0	$0	0%
	Distribution Lines	$3,700,000	$60,000	2%
Oil Systems	Pipelines	$0	$0	0%
	Facilities	$500,000	$70,000	14%
Electrical Power	Facilities	$0	$0	0%
Communication	Facilities	$100,000	$20,000	20%
	TOTAL	**$19,300,000**	**$630,000**	

Map: Shake Intensity Map – Puente Hills M7.1
(Source: Emergency Planning Consultants)



Map: Seismic Shaking Intensities for the Puente Hills M7.1 (Source: State of California Department of Conservation)



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	*<0.1*	*0.5*	*2.4*	*6.7*	*13*	24	44	83	>156
PEAK VEL.(cm/s)	<0.07	0.4	1.9	5.8	*11*	*22*	*43*	*83*	*>160*
INSTRUMENTAL INTENSITY	I	II–III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Wald, et al.; 1999

Whittier M6.8 Earthquake Scenario

Building Damage

Table: Expected Building Damage by Occupancy – Whittier M6.8

	None	Slight	Moderate	Extensive	Complete
	Count	Count	Count	Count	Count
Agriculture	9	1	0	0	0
Commercial	401	46	7	0	0
Education	8	1	0	0	0
Government	4	0	0	0	0
Industrial	167	22	4	0	0
Other Residential	309	27	2	0	0
Religion	20	2	0	0	0
Single Family	1,879	154	2	0	0
Total	**2,796**	**253**	**15**	**0**	**0**

Table: Expected Building Damage by Building Type – Whittier M6.8

	None	Slight	Moderate	Extensive	Complete
	Count	Count	Count	Count	Count
Wood	2,224	184	2	0	0
Steel	135	15	4	0	0
Concrete	112	13	2	0	0
Precast	130	22	5	0	0
RM	161	10	2	0	0
URM	32	7	1	0	0
MH	3	1	0	0	0
Total	**2,796**	**253**	**15**	**0**	**0**

Transportation and Utility Lifeline Damage

Table: Expected Utility System Pipeline Damage – Whittier M6.8

System	Total Pipelines (Length km)	Number of Leaks	Number of Breaks
Potable Water	468	502	126
Waste Water	281	360	90
Natural Gas	187	103	26
Oil	0	0	0

Table: Potable Water and Electric Power System Performance – Whittier M6.8

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	**4,173**	3,405	2,237	0	0	0
Electric Power		0	0	0	0	0

Shelter Requirement

HAZUS estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 11,411) will seek temporary shelter in public shelters.

Casualties

The table below represents a summary of casualties estimated for Whittier M6.8 earthquake scenario.

Table: Casualty Estimates – Whittier M6.8

Time	Sector	Level 1	Level 2	Level 3	Level 4
2AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single-Family	0	0	0	0
	TOTAL	**0**	**0**	**0**	**0**
2PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single-Family	1	0	0	0
	TOTAL	**1**	**0**	**0**	**0**
5PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single-Family	1	0	0	0
	TOTAL	**1**	**0**	**0**	**0**

Economic Losses

The total economic loss estimated for the Whittier M6.8 earthquake scenario is **$19.40 million dollars** which includes building and lifeline related losses based on the region's available inventory. The following tables provide more detailed information about these losses.

Table: Building-Related Economic Losses ($ Dollars) – Whittier M6.8

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses	Wage	$0	$1,000	$121,300	$10,500	$8,000	$140,800
	Capital-Related	$0	$400	$96,500	$6,600	$1,300	$104,800
	Rental	$8,600	$38,900	$164,300	$4,900	$1,000	$217,700
	Relocation	$8,800	$15,800	$158,000	$29,900	$8,400	$220,900
	Subtotal	**$17,400**	**$56,100**	**$540,100**	**$51,900**	**$18,700**	**$684,200**
Capital Stock Losses	Structural	$202,300	$106,000	$403,500	$118,900	$23,900	$854,600
	Non-Structural	$1,782,200	$1,714,400	$3,332,600	$1,332,400	$249,700	$8,411,300
	Content	$797,600	$585,900	$2,361,900	$917,100	$183,000	$4,845,500
	Inventory	$0	$0	$79,400	$138,900	$2,100	$220,400
	Subtotal	**$2,782,100**	**$2,406,300**	**$6,177,400**	**$2,507,300**	**$458,700**	**$14,331,800**
	TOTAL	**$2,799,500**	**$2,462,400**	**$6,717,500**	**$2,559,200**	**$477,400**	**$15,016,000**

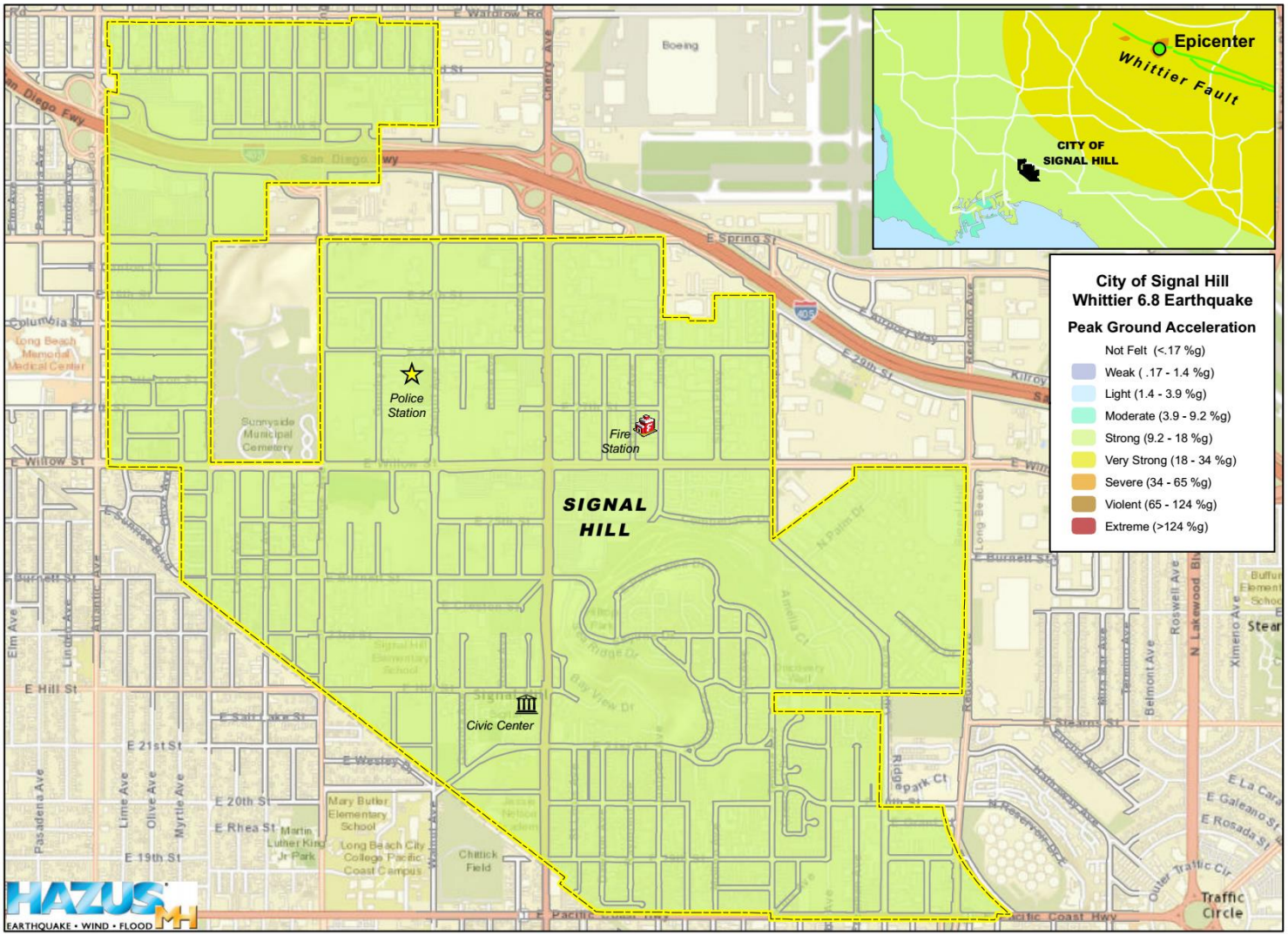
Table: Transportation System Economic Losses ($ Dollars) – Whittier M6.8

System	Component	Total Inventory Value	Economic Loss	Loss Ratio %
Highway	Segments	$49,000,000	$0	0%
	Bridges	$10,490,000	$11,700	1%
	Tunnels	$0	$0	0%
Railways	Segments	$5,030,000	$0	0%
	Bridges	$0	$0	0%
	Tunnels	$0	$0	0%
	Facilities	$0	$0	0%
Light Rail	Segments	$0	$0	0%
	Bridges	$0	$0	0%
	Tunnels	$0	$0	0%
	Facilities	$0	$0	0%
Bus	Facilities	$0	$0	0%
Ferry	Facilities	$0	$0	0%
Port	Facilities	$0	$0	0%
Airport	Facilities	$0	$0	0%
	TOTAL	**$64,520,000**	**$11,700**	

Table: Utility System Economic Losses ($ Dollars) – Whittier M6.8

System	Component	Total Inventory Value	Economic Loss	Loss Ratio %
Potable Water	Pipelines	$0	$0	0%
	Facilities	$0	$0	0%
	Distribution Lines	$9,400,000	$2,259,700	24%
Waste Water	Pipelines	$0	$0	0%
	Facilities	$0	$0	0%
	Distribution Lines	$5,600,000	$1,619,400	29%
Natural Gas	Pipelines	$0	$0	0%
	Facilities	$0	$0	0%
	Distribution Lines	$3,700,000	$464,500	12%
Oil Systems	Pipelines	$0	$0	0%
	Facilities	$500,000	$22,800	5%
Electrical Power	Facilities	$0	$0	0%
Communication	Facilities	$100,000	$5,700	6%
	TOTAL	**$19,300,000**	**$4,372,100**	

Map: Shake Intensity Map – Whittier M6.8
(Source: Emergency Planning Consultants)



Structures and Building Code

The built environment is susceptible to damage from earthquakes. Buildings that collapse can trap and bury people. Lives are at risk, and the cost to clean up the damages is great. In most California communities, including the City of Signal Hill, many buildings were built before 1993 when building codes were not as strict. In addition, retrofitting is not required except under certain conditions and can be expensive. Therefore, the number of buildings at risk remains high. The California Seismic Safety Commission makes annual reports on the progress of the retrofitting of unreinforced masonry buildings. According to the City of Signal Hill General Plan – Safety Element (2016), all URM buildings within the City have been identified and upgraded to meet current requirements.

Implementation of earthquake mitigation policy most often takes place at the local government level. The City of Signal Hill Building Safety Department enforces building codes pertaining to earthquake hazards.

Additionally, the City has implemented basic building requirements that are above and beyond what the State demands for hazard mitigation. Newly constructed buildings in Signal Hill that are built in an area subject to Earthquake-induced landslide or liquefaction are typically built with extra foundation support. Such support is found in the post-tension reinforced concrete foundation; this same technique is used by coastal cities to prevent home destruction during cases of liquefaction.

Generally, these codes seek to discourage development in areas that could be prone to flooding, landslide, wildfire and/or seismic hazards; and where development is permitted, that the applicable construction standards are met. Developers in hazard-prone areas may be required to retain a qualified professional engineer to evaluate level of risk on the site and recommend appropriate mitigation measures.

Landslide Hazards

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2

Q: B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Previous Occurrences of Landslides in the City of Signal Hill** below.

Previous Occurrences of Landslides in the City of Signal Hill

Signal Hill was most recently impacted in 1995 when a portion of Panorama Drive collapsed due to undermining of the asphalt roadway by heavy rains.

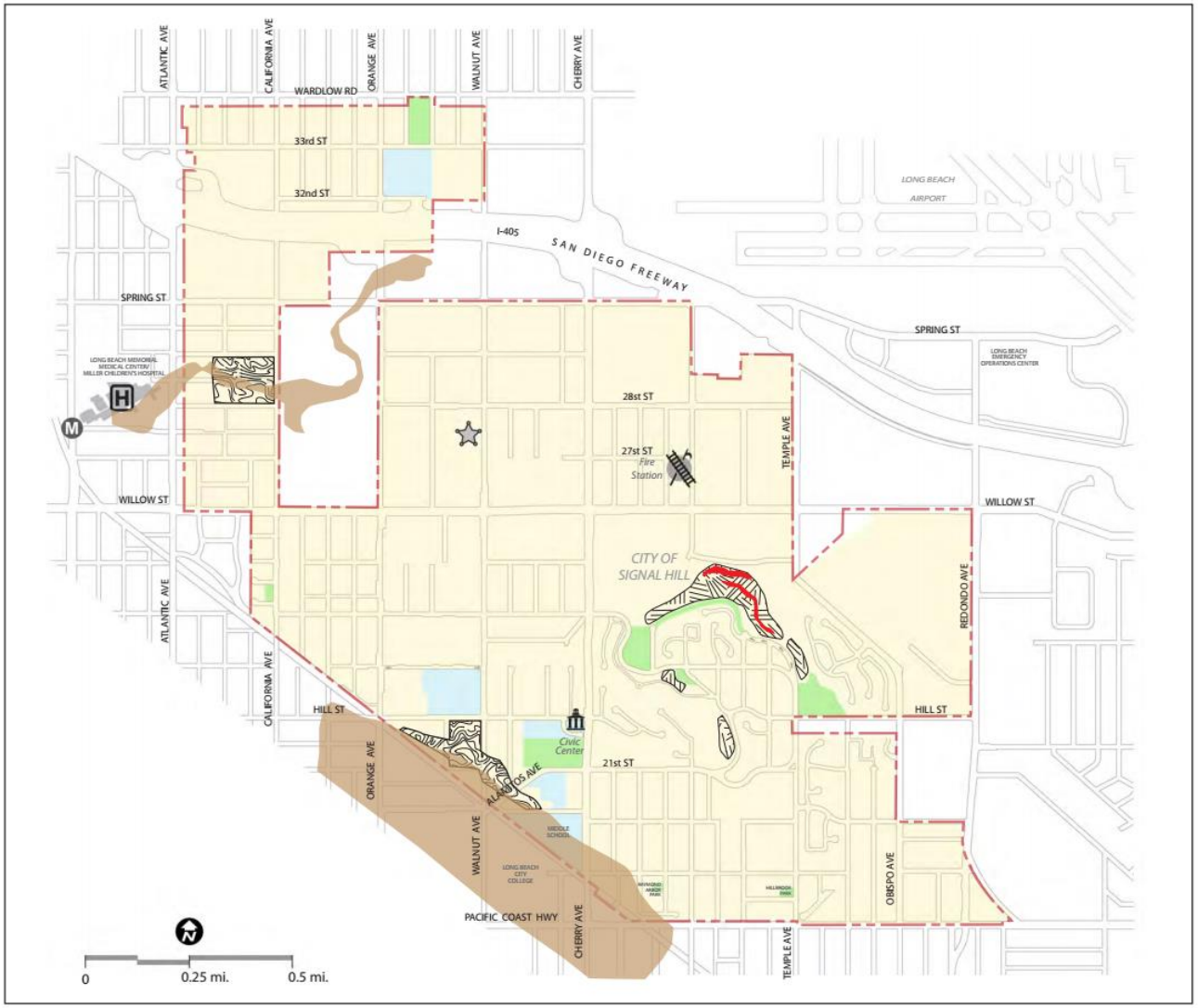
Since the writing of the 2012 Mitigation Plan, there have been no significant landslide events in the City of Signal Hill.

Local Conditions

According to the City of Signal Hill General Plan – Safety Element (2016), landslides can result from earthquake-related ground shaking or failure of steep slopes due to water saturation or unstable soil conditions. Landslides can overrun structures and other property, and cause human injury or death. They can sever utility lines and block roads, thereby hindering rescue operations following an earthquake. The Seismic Hazards Mapping Act requires identification of landslide zones in which the stability of hill slopes must be evaluated. Areas that previously experienced landslide movement and/or local topographic, geological, geotechnical, and groundwater conditions may indicate the potential for future, permanent ground displacements. If confirmed during site geotechnical analyses, site mitigation would be required.

The areas found susceptible to landslides are found in the upper reaches of Signal Hill. Development, mostly completed over the past decade, is located both above and below areas at risk of landslides. Geotechnical analyses were prepared for these developments, and risks associated with landslides were mitigated to reduce their potential impacts. As shown on **Map: Landslide Hazard Areas**, two areas remain with landslide potential in the city, located north of Panorama Promenade and southwest of Sunset View Park.

Map: Landslide Hazard Areas
(Source: City of Signal Hill General Plan – Safety Element 2016)



City of Signal Hill
GENERAL PLAN

Safety Element
October 2010

City of Signal Hill Boundary

Liquefaction Hazard

Undeveloped Land with Liquefaction Potential

Landslide Movement Hazard

Undeveloped Land with Landslide Potential

Source: Prepared by Earth Consultants International with data from the California Division of Mines and Geology.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

Q: B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Impacts of Landslides in the City of Signal Hill** below.

Impacts of Landslides in the City of Signal Hill

Based on the risk assessment, it is evident that landslides continue to have potentially devastating economic impact to certain areas of the City.

Impacts that is not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life
- ✓ Commercial and residential structural damage
- ✓ Disruption of and damage to public infrastructure
- ✓ Secondary health hazards e.g. mold and mildew
- ✓ Damage to roads/bridges resulting in loss of mobility
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed

Windstorm Hazards

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2

Q: B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Previous Occurrences of Windstorms in the City of Signal Hill** below.

Previous Occurrences of Windstorms in the City of Signal Hill

Severe windstorms pose a significant risk to life and property in the City of Signal Hill by creating conditions that disrupt essential systems such as public utilities, telecommunications, and transportation routes. High winds can and do occasionally cause tornado-like damage to local homes and businesses in and near the community. High winds have destructive impact, especially to trees, power lines, and utility services.

In November of 1996, the coastal areas along Los Angeles County experienced high winds gusting a range of 50-90 miles per hour for a brief period of time (source: NOAA Storm Events). However, since the establishment of the City there are only limited accounts of winds exceeding 40 miles per hour and only minor damages recalled. Since the writing of the 2012 Mitigation Plan, there have been no significant windstorm events in the City of Signal Hill. Even so, the Planning Team felt that climate change and a return of tropical storms could very well see an increase in high wind events resulting in extensive damage caused by falling of Eucalyptus trees.

Local Conditions

According to the City, Signal Hill is at increased risk of windstorm damage – especially from falling trees.

Recent drought conditions have significantly increased the vulnerability of trees due to lack of necessary water. Additionally, eucalyptus trees within Signal Hill are specifically and currently prone to pest infestation. The infected, dying trees are increasingly vulnerable to severe Santa Ana wind conditions.

Historically, the region has seen high wind conditions to cause injury, death, property damage, and fanned wildfires. Windstorms with significant intensity have been responsible for the sinking of watercraft and the downing of aircraft resulting in the loss of life. The most common wind condition is a Santa Ana Wind. This condition has generated winds that have exceeded 100 mph. Wind velocities of up to 111 mph have been generated from the same Santa Ana wind, resulting in the loss of life due to flying debris.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

Q: B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Impacts of Windstorms in the City of Signal Hill** below.

Impacts of Windstorms in the City of Signal Hill

Based on the risk assessment, it is evident that Windstorms continue to have potentially devastating economic impact to certain areas of the City.

Impacts that is not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life
- ✓ Commercial and residential structural damage
- ✓ Disruption of and damage to public infrastructure
- ✓ Secondary Health hazards e.g. mold and mildew
- ✓ Damage to roads/bridges resulting in loss of mobility
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.

Drought Hazards

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2

Q: B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Previous Occurrences of Drought in the City of Signal Hill** below.

Previous Occurrences of Drought in the City of Signal Hill

Fortunately, there is no history of severe drought (e.g. restaurants with restricted hours, emergency water distribution to residents, etc.) within the City of Signal Hill. However, the City is designated on the U.S. Drought Monitor as experiencing an "exceptional drought". This designation comes from a combination of a significant decrease in rain combined with water supply restrictions resulting from the state-wide California drought. These conditions were increasingly evident from 2012 to early in 2017.

Previous Occurrences of Drought in Los Angeles County

The region's Mediterranean climate makes it especially susceptible to variations in rainfall. Though the potential risk to the City of Signal Hill is in no way unique, severe water shortages could have a bearing on the economic well-being of the community. Comparison of climate (rainfall) records from Los Angeles with water well records beginning in 1930 from the San Gabriel Valley indicates the existence of wet and dry cycles on a 10-year scale as well as for much longer periods. The climate record for the Los Angeles region beginning in 1890 suggests drying conditions over the last century. With respect to the present day, climate data also suggests that the last significant wet period was the 1940s. Well level data and other sources seem to indicate the historic high groundwater levels (reflecting recharge from rainfall) occurred in the same decade. Since that time, rainfall (and groundwater level trends) appears to be in decline. This slight declining trend, however, is not believed to be significant. Climatologists compiled rainfall data from 96 stations in the State that spanned a 100-year period between 1890 and 1990. An interesting note is that during the first 50 years of the reporting period, there was only one year (1890) that had more than 35 inches of rainfall, whereas the second 50-year period recording of 5-year intervals (1941, 1958, 1978, 1982, and 1983) that exceeded 35 inches of rainfall in a single year. The year of maximum rainfall was 1890 when the average annual rainfall was 43.11 inches. The second wettest year on record occurred in 1983 when the State's average was 42.75 inches.

The driest year of the 100-year reported in the study was 1924 when the State's average rainfall was only 10.50 inches. The region with the most stations reporting the driest year in 1924 was the San Francisco Bay area. The second driest year was 1977 when the average was 11.57 inches. The most recent major drought (1987 to 1990) occurred at the end of a sequence of very wet years (1978 to 1983). The debate continues whether "global warming" is occurring, and the degree to which global climate change will have an effect on local micro-climates. The semi-arid southwest is particularly susceptible to variations in rainfall. A study that documented annual precipitation for California since 1600 from reconstructed tree ring data indicates that there was a prolonged dry spell from about 1755 to 1820 in California. Fluctuations in precipitation could contribute indirectly to a number of hazards including wildfire and the availability of water supplies.

Local Conditions

According to the City of Signal Hill General Plan – Circulation Element (2009), the City's primary water supply comes from two groundwater wells located in north Long Beach. Additional water may be purchased from the Metropolitan Water District of Southern California.

The City has drilled a third groundwater well centrally located within Signal Hill and is in the process of developing plans and specifications for the necessary pumping and treatment facilities. The City has three storage reservoirs and pumping facilities, providing water for domestic purposes and firefighting. The Gundry reservoir and pumping facility was constructed in 1929 and has a storage capacity of 4.7 million gallons. This facility is located in the northern part of the city. Two hilltop reservoirs and pumping facilities were constructed in the late 1990s, having a combined storage capacity of 2.6 million gallons.

A significant drought has hit the state of California since 2012. The drought has depleted reservoir levels all across the state. In January of 2014, Governor Brown declared a state of emergency and directed state officials to take all necessary actions to prepare for water shortages. As the drought prolonged into 2015, to help cope with the drought, Governor Brown gave an executive order in April 2015 which mandated a statewide 25 percent reduction in water use. In January of 2016, the DWR and the U.S. Bureau of Reclamation have finalized the 2016 Drought Contingency Plan that outlines State Water Project and Central Valley Project operations for February 2016 to November 2016. The plan was developed in coordination with staff from State and federal agencies. Although the drought has more significantly impacted surfaces waters and other agencies that use water for agriculture, the City of Signal Hill is still affected by the drought, primarily due to reduced reliability of imported water.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3

Q: B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Impacts of Drought in the City of Signal Hill** below.

Impacts of Drought in the City of Signal Hill

Based on the risk assessment, it is evident that drought events continue to have potentially devastating economic impacts to certain areas of the City.

Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life
- ✓ Disruption of and damage to public infrastructure
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values
- ✓ Uncontrolled fires and associated injuries and damage

PART III: MITIGATION STRATEGIES

Mitigation Strategies

Overview of Mitigation Strategy

As the cost of damage from natural disasters continues to increase nationwide, the City of Signal Hill recognizes the importance of identifying effective ways to reduce vulnerability to disasters. Mitigation Plans assist communities in reducing risk from natural hazards by identifying resources, information and strategies for risk reduction, while helping to guide and coordinate mitigation activities throughout the City.

The plan provides a set of action items to reduce risk from natural hazards through education and outreach programs, and to foster the development of partnerships. Further, the plan provides for the implementation of preventative activities, including programs that restrict and control development in areas subject to damage from natural hazards.

The resources and information within the Mitigation Plan:

1. Establish a basis for coordination and collaboration among agencies and the public in the City of Signal Hill;
2. Identify and prioritize future mitigation projects; and
3. Assist in meeting the requirements of federal assistance programs

The Mitigation Plan is integrated with other City plans including the City of Signal Hill Emergency Operations Plan, General Plan as well as department-specific standard operating procedures.

Mitigation Measure Categories

Following is FEMA's list of mitigation categories. The activities identified by the Planning Team are consistent with the six broad categories of mitigation actions outlined in FEMA publication 386-3 *Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies*.

- ✓ **Prevention:** Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.
- ✓ **Property Protection:** Actions that involve modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- ✓ **Public Education and Awareness:** Actions to inform and educate citizens, property owners, and elected officials about hazards and potential ways to mitigate them.

  Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

- ✓ **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses preserve or restore the functions of natural systems. Examples include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- ✓ **Emergency Services:** Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.
- ✓ **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, retaining walls, and safe rooms.

Q&A | ELEMENT C. MITIGATION STRATEGY | C3

Q: C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))

A: See **Goals** below.

Goals

The Planning Team developed mitigation goals to avoid or reduce long-term vulnerabilities to hazards. These general principles clarify desired outcomes.

The goals are based on the risk assessment and Planning Team input, and represents a long-term vision for hazard reduction or enhanced mitigation capabilities. They are compatible with community needs and goals expressed in other planning documents prepared by the City.

Each goal is supported by mitigation action items. The Planning Team developed these action items through its knowledge of the local area, risk assessment, review of past efforts, identification of mitigation activities, and qualitative analysis.

The five mitigation goals and descriptions are listed below.

FEMA defines **Goals** as general guidelines that explain what you want to achieve. They are usually broad policy-type statements, long-term, and represent global visions.

FEMA defines **Mitigation Activities** as specific actions that help you achieve your goals and objectives.

Protect Life and Property

Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to losses from natural, human-caused, and technological hazards.

Improve hazard assessment information to make recommendations for avoiding new development in high hazard areas and encouraging preventative measures for existing development in areas vulnerable to natural, human-caused, and technological hazards.

Enhance Public Awareness

Develop and implement education and outreach programs to increase public awareness of the risks associated with natural, human-caused, and technological hazards.

Provide information on tools; partnership opportunities, and funding resources to assist in implementing mitigation activities.

Preserve Natural Systems

Support management and land use planning practices with hazard mitigation to protect life.

Preserve, rehabilitate, and enhance natural systems to serve hazard mitigation functions.

Encourage Partnerships and Implementation

Strengthen communication and coordinate participation with public agencies, citizens, non-profit organizations, business, and industry to support implementation.

Encourage leadership within the City and public organizations to prioritize and implement local and regional hazard mitigation activities.

Strengthen Emergency Services

Establish policy to ensure mitigation projects for critical facilities, services, and infrastructure.

Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry.

Coordinate and integrate hazard mitigation activities where appropriate, with emergency operations plans and procedures.

The Planning Team also developed hazard-specific mitigation goals, which appear in the **Mitigation Strategies Section**.

How are the Mitigation Action Items Organized?

The action items are a listing of activities in which City agencies and citizens can be engaged to reduce risk. Each action item includes an estimate of the timeline for implementation.

The action items are organized within the following **Mitigation Actions Matrix**, which lists all of the multi-hazard (actions that reduce risks for more than one specific hazard) and hazard-specific action items included in the mitigation plan. Data collection and research and the public participation process resulted in the development of these action items. The Matrix includes the following information for each action item:

Funding Source

The action items can be funded through a variety of sources, possibly including: operating budget/general fund, development fees, Community Development Block Grant (CDBG), Hazard Mitigation Grant Program (HMGP), other Grants, private funding, Capital Improvement Plan, and other funding opportunities.

Coordinating Organization

The Mitigation Actions Matrix assigns primary responsibility for each of the action items. The hierarchies of the assignments vary – some are positions, others departments, and other committees. The primary responsibility for implementing the action items falls to the entity shown as the "Coordinating Organization". The coordinating organization is the agency with regulatory responsibility to address hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring, and evaluation. Coordinating organizations may include local, County, or regional agencies that are capable of or responsible for implementing activities and programs.

Plan Goals Addressed

The plan goals addressed by each action item are included as a way to monitor and evaluate how well the mitigation plan is achieving its goals once implementation begins.

The plan goals are organized into the following five areas:

- ✓ Protect Life and Property
- ✓ Enhance Public Awareness
- ✓ Preserve Natural Systems
- ✓ Encourage Partnerships and Implementation
- ✓ Strengthen Emergency Services

Q&A | ELEMENT C. MITIGATION STRATEGY | C5

Q: C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))

A: See **Priority Ratings** below.

Benefit/Cost Ratings

The benefits of proposed projects were weighed against estimated costs as part of the project prioritization process. The benefit/cost analysis was not of the detailed variety required by FEMA for project grant eligibility under the Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) grant program. A less formal approach was used because some projects may not be implemented for up to 10 years, and associated costs and benefits could change dramatically in that time. Therefore, a review of the apparent benefits versus the apparent cost of each project was performed. Parameters were established for assigning subjective ratings (high, medium, and low) to the costs and benefits of these projects.

Cost ratings were defined as follows:

High: Existing jurisdictional funding will not cover the cost of the action item so other sources of revenue would be required.

Medium: The action item could be funded through existing jurisdictional funding but would require budget modifications.

Low: The action item could be funded under existing jurisdictional funding.

Benefit ratings were defined as follows:

High: The action item will provide short-term and long-term impacts on the reduction of risk exposure to life and property.

Medium: The action item will have long-term impacts on the reduction of risk exposure to life and property.

Low: The action item will have only short-term impacts on the reduction of risk exposure to life and property.

Priority Rating

Going beyond rating "benefit and cost", the Planning Team adopted the following process for rating the "priority" of each mitigation action item. Designations of "High", "Medium", and "Low" priority have been assigned to each action item using the following criteria:

Does the Action:
- solve the problem?
- address Vulnerability Assessment?
- reduce the exposure or vulnerability to the highest priority hazard?
- address multiple hazards?
- benefits equal or exceed costs?
- implement a goal, policy, or project identified in the General Plan or Capital Improvement Plan?

Can the Action:
- be implemented with existing funds?
- be implemented by existing state or federal grant programs?
- be completed within the 5-year life cycle of the LHMP?
- be implemented with currently available technologies?

Will the Action:
- be accepted by the community?
- be supported by community leaders?
- adversely impact segments of the population or neighborhoods?
- require a change in local ordinances or zoning laws?
- positive or neutral impact on the environment?
- comply with all local, state and federal environmental laws and regulations?

Is there:
- sufficient staffing to undertake the project?
- existing authority to undertake the project?

As mitigation action items were updated or written the Planning Team, representatives were provided worksheets for each of their assigned action items. Answers to the criteria above determined the priority according to the following scale.

- 1-6 = Low priority
- 7-12 = Medium priority
- 13-18 = High priority

Q&A | ELEMENT C. MITIGATION STRATEGY | C1

Q: C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT C. MITIGATION STRATEGY | C4

Q: C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT C. MITIGATION STRATEGY | C5

Q: C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT D. MITIGATION STRATEGY | D2

Q: D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT D. MITIGATION STRATEGY | D3

Q: D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))

A: See **Mitigation Actions Matrix** below.

Mitigation Actions Matrix

Following is **Table: Mitigation Actions Matrix** which identifies the existing and future mitigation activities developed by the Planning Team.

Table: Mitigation Actions Matrix

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
Multi-Hazard Mitigation Action Items														
MH-1 Integrate the goals and action items from the City of Signal Hill Hazard Mitigation Plan into existing regulatory documents and programs, where appropriate.	A, CD, PW	Ongoing	X	X	X	X	X	Y	GF	GF	H	L	H	Revised. Note: updated Safety Element and Ordinances
MH-2 Identify and pursue funding opportunities to develop and implement local mitigation activities.	A, CD, PW	Ongoing	X	X	X			Y	GF	GF	H	L	H	Revised
MH-3 Enhance and implement education programs aimed at	A, PD, CS, PW	Ongoing	X	X		X	X		GF	GR	H	L	H	Revised

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
mitigating natural hazards, and reducing the risk to citizens, public agencies, private property owners, businesses, and schools. Existing programs include CERT, Map Your Neighborhood, and American Red Cross 21 Weeks to Prepare.														
MH-4 Establish policy to ensure mitigation projects are in place to safeguard critical facilities (as identified in the General Plan Safety Element).	PW	1 year	X					Y	GF	GF	H	L	H	Revised
MH-5 Adopt California Building Code.	CD	Ongoing	X					Y	GF	GF	L	L	L	Revised. Note: Adopted every 3 years
MH-6 Develop seismic inventory of at-risk City-owned buildings and infrastructure and prioritize mitigation projects.	PW, CD	2 years	X				X	Y	GR	GR	H	H	H	Revised
MH-7 Improve communication	PW	Ongoing	X			X	X	Y	GR	GR	H	H	H	Revised

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
between City and County road departments produce strategies to deal with transportation infrastructure.														
MH-8 Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry.	PD, PW	Ongoing		X		X	X		GF	GF	M	L	M	Revised
~~MH-9 Compile a directory of out-of-area contractors to help with repairs/reconstruction so that restoration occurs in a timely manner.~~	~~F, PW~~	~~1 year~~					~~X~~							Deleted
~~MH-10 Ensure public utilities serving buildings identified for use as shelters are retrofitted.~~	~~PW~~	~~5 years~~	~~X~~				~~X~~							Deleted
MH-11 Install and improve back-up	PW	Ongoing					X	Y	GF	GF	H	H	H	Revised. Note: Already installed

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
power in city owned critical facilities as cited in the GP Safety Element.														portable generators at PD, PW, and every traffic signal (2 hours).
MH-12 Continue to encourage the development of mutual aid systems between Signal Hill and surrounding cities for emergency building assessment, CERT training, etc.	PW/PD	Ongoing	X			X	X		GF	GF	H	M	M	Revised. Note: PW mutual aid agreements in place with County of Los Angeles and City of Long Beach.
MH-13 Promote public education and outreach to increase awareness of hazards and opportunities for mitigation. Continue to stock brochures from American Red Cross, FEMA, and Cal OES about preparedness and home mitigation.	PD	Ongoing	X	X					GF	GF	H	M	M	Revised. Note: Very active program in place at City Hall to distribute brochures and other materials relating to preparedness and mitigation.
~~MH-14 Develop and implement education and outreach programs~~	~~PD~~	~~1 year~~	~~X~~	~~X~~										Merged with MH-13

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
~~to increase public awareness of the risks associated with natural hazards.~~														
MH-15 Distribute information about evacuation route maps.	F CD	1 year	X	X					GF	GF	H	M	M	Revised. Disaster Movement Routes part of updated General Plan Safety Element.
MH-16 Post the Hazard Mitigation Plan on the City's website.	A	Ongoing		X					GF	GF	H	M	M	Revised
~~MH-17 Hold a town-sponsored hazard mitigation seminar for the community residents.~~	~~PD, CS~~	~~1 year~~		~~X~~		~~X~~								Deleted
~~MH-18 Develop City Talk Show about pre-disaster information.~~	~~A, PD~~	~~1 year~~		~~X~~										Deleted
MH-19 Maintain primary and alternate Emergency Operations Centers.	PD	Ongoing	X	X			X		GF	GF	H	M	M	Revised. Primary EOC located in the new Police HQ, alternate EOC located at PW Yard.
MH-20 Continue to provide informational literature on animal disaster plans and supply kits.	CS	Ongoing	X	X					GF	GF	H	M	M	Revised. Note: Brochures distributed at City Hall.

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
MH-21 Encourage the American Red Cross to hold a variety of courses, including: CPR, Basic First Aid, Introduction to Disaster Services, Mass Care, Shelter Operations, babysitting, Healthcare Provider, pet first-aid and others at the Red Cross Office and at other locations throughout the City.	CS	Ongoing	X	X		X	X		GF	GF	M	L	L	Revised
~~MH-22 Advertise the availability of emergency management materials on the City's website.~~	~~A~~	~~1.5 years~~	~~X~~	~~X~~	~~X~~		~~X~~							Deleted - redundant
~~MH-23 Educate the public on existing self-help agencies available within the greater community.~~	~~A~~	~~2 years~~		~~X~~										Deleted - redundant
~~MH-24 Partner with other agencies such as Hospitals, County departments, neighboring cities,~~	~~A, CS~~	~~1.5 years~~		~~X~~										Deleted - redundant

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
~~etc. to include the Website address as a link on their websites.~~														
~~MH-25 The State and County Office of Emergency Services websites have information about disaster preparedness and related links. Expand and update links to those websites as needed and as appropriate.~~	~~A~~	~~1.5 years~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~							Deleted - redundant
~~MH-26 Maintain resource center at City Hall. Display rack should include the Emergency Preparedness Guidebook, FEMA's Are You Ready, the Special Needs Survey, brochures on disaster supplies kits and plans, etc.~~	~~CS~~	~~1 year~~		~~X~~										Merged with MH-13
MH-27 Involve Hazard Mitigation Planning Team in review of future updates of the City General Plan or	CD	Ongoing	X	X	X		X	Y	GF	GF	M	L	M	Revised

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
Zoning Ordinance to ensure consideration of threats posed by hazards.														
MH-28 Identify and prioritize needs for additional shelter supplies for City employees to include but not limited to additional cots, blankets and shelter kits.	CS	Ongoing	X				X		GF	GF	H	M	M	Revised
MH-29 Teach CERT classes to interested citizens in the City and CITY employees to assist their neighbors during emergencies. This course will be taught utilizing City staff and resources independent of Los Angeles Co. Fire. Promote CERT through the Chamber of Commerce to gain business participation.	PD	Ongoing	X	X			X		GR	GR	H	H	H	Revised. Note: City on 7th class.
MH-30 Train, law enforcement,	PD	Ongoing	X	X	X	X	X		GF	GF	M	H	M	Revised

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
public works, CERT members and other support personnel in the Incident Command System.														
~~MH-31 Promote CERT through the Chamber of Commerce to gain business participation.~~	~~PD~~	~~1 year~~	~~X~~	~~X~~										Merged with MH-29
MH-32 Provide copies of the Hazard Mitigation Plan to the Community Development Department for their information during new development considerations.	A	Completed	X		X			Y	n/a	n/a	n/a	n/a	n/a	Revised
MH-33 The Community Development Department will review the General Plan to ensure that designated growth areas are not in high hazard areas identified in this plan.	CD	Completed	X		X			Y	n/a	n/a	n/a	n/a	n/a	Revised
MH-34 Review and update all	PD	Completed	X	X		X	X		n/a	n/a	n/a	n/a	n/a	Revised

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
annexes of the City's Emergency Operations Plan. Include participation from all departments and outside providers of emergency services in the update process.		2016												
MH-35 Build a new E911 Communications Center or ECC in conjunction with the construction of a new VHF-trunked radio system. The new system will feature a combined ECC dispatch facility with a ten (10) workstation design to serve all public safety and local government agencies. The center's operation will be CAD based with Enhanced 9-1-1 interface that includes hard wire and wireless call number and location	PD	Completed 2013					X		n/a	n/a	n/a	n/a	n/a	Revised

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
identification using a GIS/GPS digital mapping component. An optional feature for mobile units will include mobile data transmission capability using mobile mounted laptops to provide rapid access to information critical to most emergency response incidents.														
MH-36 Ensure that when ECC/911 system upgrade is completed, there is a capability to communicate with all EOC agencies with redundant backups in voice and data communications.	PD	3 years	X				X		GF	GF	H	H	H	Revised
MH-37 Establish an offsite Emergency Communications Center (ECC), alternate Emergency Operations Center (EOC) at Public Works, and	PD	Completed	X				X		n/a	n/a	n/a	n/a	n/a	Revised

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
purchase and equip Mobile Command Center. In the event the primary sites must be vacated, the off-site back-up centers can be rapidly mobilized in a secured facility. Both centers will duplicate the primary points of operation.														
MH-38 Work with Volunteer Organizations Active in Disasters (VOAD), American Red Cross, and Salvation Army to ensure representation on the EOP Committee.	PD	Completed	X	X		X	X		n/a	n/a	n/a	n/a	n/a	Revised
MH-39 Conduct joint exercise with school district and other special districts located within the City boundaries.	PD	Completed	X	X		X	X		n/a	n/a	n/a	n/a	n/a	Revised. Note: Exercise was with National Guard
MH-40 Ensure that the actions and findings of the LEPC are	A	Completed				X			n/a	n/a	n/a	n/a	n/a	Revised

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
incorporated into the City EOP and Mitigation Plan updates and revisions.														
MH-41 Ensure training and exercise standards are maintained (as established in the Standardized Emergency Management System).	PD	Completed	X	X		X	X		n/a	n/a	n/a	n/a	n/a	Revised
~~MH-42 Identify potential funding sources outside of City Government to continue a program of building and maintaining community partnerships, planning, public awareness and education and disaster mitigation and preparedness.~~	~~A, F~~	~~1 year~~		~~X~~		~~X~~	~~X~~							Deleted
MH-43 Amend job description of Emergency Operations Coordinator to include leading the City's Hazard Mitigation Planning		Ongoing		X	X	X	X		GF	GF	M	M	M	Revised

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
Team in developing a sustainable process for implementing, monitoring, and evaluating the mitigation activities.														
~~MH-44 Repeat the "Levels of Concern" survey in five years to monitor successes and failures of natural hazard mitigation programs.~~	~~A~~	~~5 years~~		~~X~~	~~X~~	~~X~~	~~X~~							Deleted
~~MH-45 Develop and complete a baseline survey to gather perceptions of private citizens and the business community regarding natural hazard risks and identify mitigation needs.~~	~~CS~~	~~Done~~	~~X~~	~~X~~		~~X~~	~~X~~							Deleted
~~MH-46 Work with Community Planning Organizations (CPOs) and other neighborhood groups to establish a Community Emergency~~	~~PD~~	~~Ongoing~~	~~X~~	~~X~~		~~X~~	~~X~~							Deleted - redundant

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
~~Response Team (CERT).~~														
MH-47 Familiarize City Finance staff of requirements regarding public assistance (disaster cost recovery) following a declared disaster.	F, PD	Ongoing	X	X		X	X		GF	GF	H	L	H	Revised
MH-48 Identify opportunities for partnering with citizens, private contractors, and other jurisdictions to increase availability of equipment and manpower for efficiency of response efforts.	A	Ongoing	X	X	X	X	X		GF	GF	H	L	H	Revised
~~MH-49 Develop hazard GIS database of all repetitive loss properties in the City to be used in future mitigation activities.~~	~~A, PW~~	~~5 years~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~							Deleted – no repetitive loss properties
~~MH-50 Continue working with the State of California to get updated repetitive loss information on~~	~~PW, CD~~	~~1 year~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~							Deleted – no repetitive loss properties

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
~~properties in the City, in order to plan future mitigation activities.~~														
MH-51 Enhance weather monitoring to attain earlier severe storm warnings.	PW	Ongoing	X	X	X	X	X		GF	GF	H	L	M	Revised
MH-52 Routine maintenance of the community's infrastructure will be done to minimize the potential for system failure because of or during a disaster.	PW	Ongoing	X	X	X	X	X	Y	GF	GF	H	L	H	Revised
~~MH-53 Enhance response capability of county fire, city police, and emergency medical services personnel.~~	~~PD~~	~~6 months~~	~~X~~	~~X~~		~~X~~	~~X~~							Deleted – not mitigation
MH-54 Assess availability of backup power resources (e.g. generators, solar, etc.) of medical facility, nursing homes, and fire, police, rescue, and emergency	PD	Ongoing	X	X		X	X	Y	GR	GR	H	H	H	Revised

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
management personnel; upgrade resources as necessary.														
~~MH-55 Develop mitigation strategies to protect identified at-risk historic properties.~~	~~CD~~	~~1 year~~	~~X~~	~~X~~		~~X~~	~~X~~							Deleted
MH-56 Implement the National Incident Management System (NIMS) in each City department.	PD	Completed	X	X	X	X	X		n/a	n/a	n/a	n/a	n/a	Revised
~~MH-57 Conduct a full review of the Hazard Mitigation Action Plan every 5 years by evaluating mitigation successes, failures, and areas that were not previously addressed.~~	~~A~~	~~5 years~~	~~X~~	~~X~~		~~X~~	~~X~~							Deleted – already mandated in regulations
~~MH-58 Determine what kinds of minor repairs and temporary protection activities (e.g., temporary roofing, protect against loss of life/injury, shoring, protect~~	~~CD~~	~~1 year~~	~~X~~				~~X~~							Deleted

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
~~contents) can be done in the immediate aftermath of a disaster.~~														
MH-59 Develop comprehensive all hazards debris management plan.	PW	2 years	X	X	X	X	X	Y	GR	GR	H	H	H	Revised. Note: City prepared a debris management strategy for use in El Nino events.
~~MH-60 Coordinate the maintenance of emergency transportation routes through communication among the county roads department, neighboring jurisdictions, and CalTrans.~~	~~PW~~	~~2 years~~	~~X~~	~~X~~		~~X~~	~~X~~							Deleted – already addressed in the Safety Element's Disaster Movement Routes.
~~MH-61 Encourage interested individuals to participate in hazard mitigation planning and training activities.~~	~~PD, CS~~	~~1 year~~	~~X~~	~~X~~		~~X~~	~~X~~							Deleted
~~MH-62 Monitor and publicize the effectiveness of mitigation initiatives implemented in the community.~~	~~A~~	~~1 year~~	~~X~~	~~X~~		~~X~~	~~X~~							Deleted

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
~~MH-63 Educate the public about procedures for reporting human-caused incidents.~~	~~PD~~	~~18 months~~	~~X~~	~~X~~		~~X~~	~~X~~							Deleted
~~MH-64 Educate the public about emergency sheltering and evacuation procedures.~~	~~PD~~	~~1 year~~	~~X~~	~~X~~		~~X~~	~~X~~							Deleted - redundant
MH-65 Educate the public about hazards prevalent to their area utilizing Map Your Neighborhood.	PD, A	Ongoing		X		X			GF	GF	H	L	H	Revised
MH-66 Purchased and trained EOC staff on Veoci – an emergency management software program.	PD	Completed	X		X	X	X		n/a	n/a	n/a	n/a	n/a	New
MH-67 Establish agreements with vendors for use of services, equipment, and/or facilities following a disaster.	F, PD	1 year	X	X	X	X	X	Y	GF	GF	H	L	M	New. Note: Already established Memorandum of Understanding with trash hauler EDCO for City to have access to trucks and other equipment following a disaster.
MH-68 Identify funding sources for	PW	1 year	X	X	X	X	X	Y	GR	GR	H	H	H	New. Moved and revised from

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
structural and non-structural retrofitting of City-owned structures that are identified as vulnerable to seismic, flooding, and other hazards.														Earthquake action items.
MH-69 Encourage purchase of hazard insurances including earthquake and flood.	A	1 year		X		X		Y	GF	GF	H	L	M	Revised
MH-70 Secure grant funding to conduct traffic study and engineering report on impact of hazardous material related heavy equipment movement on city street infrastructure.	CD/PW	3 years	X		X		X	Y	GR	GR	H	M	H	New
MH-71 Secure grant funding for city based CERT training program and ongoing equipment procurement.	PD	3 years	X	X		X	X		GR	GR	H	H	H	New
Earthquake Mitigation Action Items														

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
~~EQ-1 Incorporate the Regional Earthquake Transportation Evacuation Routes developed by the Regional Emergency Managers Group into appropriate planning documents.~~	~~PW~~	~~5 years~~	~~X~~	~~X~~		~~X~~	~~X~~							Deleted – already addressed in updated Safety Element.
~~EQ-2 Identify funding sources for structural and nonstructural retrofitting of structures that are identified as seismically vulnerable.~~	~~CD, A~~	~~1 year~~	~~X~~	~~X~~		~~X~~	~~X~~							Deleted – moved to Multi-Hazard action items.
~~EQ-3 Encourage seismic strength evaluations of critical facilities in the City to identify vulnerabilities for mitigation of schools and university, public infrastructure, and critical facilities to meet current seismic standards.~~	~~CD, PW~~	~~1 year~~	~~X~~	~~X~~		~~X~~	~~X~~							Deleted – no authority over non-City-owned properties.
EQ-4 Encourage reduction of non-structural and structural	CD	Ongoing	X	X		X	X	Y	GF	GF	H	L	M	Revised

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
earthquake hazards in homes, schools, and businesses.														
~~EQ-5 Minimize earthquake damage risk by retrofitting critical facilities.~~	~~PW~~	~~1 year~~	~~X~~	~~X~~		~~X~~	~~X~~							Deleted - redundant
EQ-6 Encourage purchase of earthquake hazard insurance.	A	1 year		X		X		Y						Deleted – Revised action item and moved to Multi-Hazard
EQ-7 As updates become available, integrate new earthquake hazard mapping data for the City and improve technical analysis of earthquake hazards.	CD	Ongoing		X		X	X	Y	GR	GR	H	H	H	Revised. Note: City stays updated with each seismic study submitted on development projects as well as updates from the State of California. Also, General Plan Safety Element is being updated.
EQ-8 Secure grant funding for updated Technical Background Report associated with the General Plan Safety Element.	CD	5 years	X	X	X		X	Y	GR	GR	H	H	H	New

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
Landslide Mitigation Action Items														
LS-1 Improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard-prone areas.	BS	Ongoing	X	X	X	X	X	Y	GF	GF	H	H	H	Revised
LS-2 Encourage construction and subdivision design that can be applied to steep slopes to reduce the potential adverse impacts from development	BS	Ongoing	X					Y	GF	GF	M	M	M	Revised
~~LS-3 Identify safe evacuation routes in high-risk debris flow and landslide areas.~~	~~CD~~	~~6 months~~	~~X~~		~~X~~	~~X~~	~~X~~							Deleted
~~LS-4 Investigate landslide warning systems to ensure effectiveness and efficiency and increase coordination between local jurisdictions and the state for~~	~~CD~~	~~6 months~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~							Deleted

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
~~landslide warning systems.~~														
LS-5 Limit activities in identified potential and historical landslide areas through regulation and public outreach.	CD	Ongoing	X	X	X	X	X	Y	GF	GF	H	L	M	Revised
Windstorm Mitigation Action Items														
WS-1 Support/encourage electrical utilities to use underground construction methods where possible to reduce power outages from windstorms.	PW	Ongoing	X	X			X	Y	GF	GF	H	L	M	Revised
WS-2 Monitor trees and branches in public areas at risk of breaking or falling in windstorms. Prune or thin trees or branches when they would pose an immediate threat to property, utility lines or other significant structures or critical	PW	Annual	X	X	X		X	Y	GF	GF	M	M	M	Revised

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
facilities in the community.														
Drought Mitigation Action Items														
DR-1 Distribute information to all property owners and renters on the importance of water conservation and different venues of purchasing water saving mechanisms for homes and businesses.	PW	Ongoing		X	X			Y	GF	GF	H	L	M	Revised
~~DR-2 Develop public education program on water conservation techniques for homes and businesses.~~	~~PW~~	~~1 year~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~							Deleted
DR-3 Investigate possibility of extending (deepening) existing water wells.	PW	Completed	X			X	X	Y	n/a	n/a	n/a	n/a	n/a	Revised. Note: Well was dug in 2008 and expected to be operational in 2016.
DR-4 Identify water resources management and conservation opportunities.	PW	Ongoing	X	X	X	X	X	Y	GF	GF	H	L	H	Revised

Mitigation Action Item	Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Partnerships and Implementation	Goal: Emergency Services	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
DR-5 Implement use of recycled water to supplement imported/local water sources.	PW	Ongoing	X	X	X	X	X	Y	GF	GF	H	M	H	Revised. Note: Already completed first phase of reclaimed water system.
DR-6 Practice water conservation by building demonstration gardens and retrofit public parks.	PW	Ongoing	X	X	X	X	X	Y	GF	GF	H	M	H	New
DR-7 Write 20X2020 Water Conservation Plan.	PW	1 year	X	X	X	X	X	Y	GF	GF	H	M	H	New

Plan Maintenance

The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing a plan revision every fifth year. This section describes how the City will integrate public participation throughout the plan maintenance process.

Q&A | ELEMENT A: PLANNING PROCESS | A6

Q: A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))

A: See **Method and Scheduling of Plan Implementation** below.

Method and Scheduling of Plan Implementation

The Planning Team that was involved in research and writing of the Plan will also be responsible for implementation. The Planning Team will be led by the Chair of the Planning Team and will be referred to as the Local Mitigation Officer.

	Year 1	Year 2	Year 3	Year 4	Year 5
Monitoring	XXXX	XXXX	XXXX	XXXX	XXXX
Evaluating					
Internal Planning Team Evaluation of Hazards, Plan Goals, and Mitigation Action Items	X	X	X	X	X
Cal OES and FEMA Evaluation					X
Updating					X

Q&A | ELEMENT A: PLANNING PROCESS | A6

Q: A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))

A: See **Plan Adoption and Approval** below.

Adoption, Approval, Monitoring and Implementing the Plan

Plan Adoption and Approval

Once the plan has been completed by the Planning Team, the Local Mitigation Officer is responsible for submitting it to the State Hazard Mitigation Officer at California Office of Emergency Services (Cal OES). Following its review and acceptance, Cal OES will forward the Plan to the Federal Emergency Management Agency (FEMA) for review and conditional approval.

Next, following any justified amendments, the Plan will be presented to the City Council for adoption. The City's governing body is one of the prime requirements for final approval of the

Plan by FEMA because it has the responsibility and authority to promote sound public policy regarding hazards for the community. Once adopted, the Plan will be sent back to FEMA for lifting of the conditional approval and replaced with a final approval. The final approval will be added to the Plan and it will then be deemed "approved". The Plan will play a significant role in the future growth and development of the City. Upon final approval by FEMA, City of Signal Hill will gain eligibility for Hazard Mitigation Grant Program funds.

Q&A | ELEMENT C. MITIGATION STRATEGY | C6

Q: C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))

A: See **Implementation through Existing Programs** below.

Implementation through Existing Programs

The City of Signal Hill addresses statewide planning goals and legislative requirements through its General Plan, its Capital Improvement Plan, and California Building and Safety Codes. The Mitigation Plan provides a series of recommendations - many of which are closely related to the goals and objectives of existing planning programs. The City of Signal Hill will implement recommended mitigation action items through existing programs and procedures.

The City of Signal Hill Building Safety Department is responsible for adhering to the State of California's Building and Safety Codes. In addition, the Planning Team will work with other agencies at the state level to review, develop and ensure Building and Safety Codes are adequate to mitigate or present damage by hazards. This is to ensure that life-safety criteria are met for new construction.

Some of the goals and action items in the Mitigation Plan will be achieved through activities recommended in the CIP. Various City departments develop the CIP and review it on an annual basis. Upon annual review of the CIP, the Planning Team will work with the City departments to identify areas that the Mitigation Plan action items are consistent with CIP goals and integrate them where appropriate.

As indicated in the Mitigation Actions Matrix, several action items have been added to ensure implementation through other existing planning mechanisms. Also, the Table: Capability Assessment: Existing Processes and Programs identifies the need to maintain balance and diversify the Hazard Mitigation Planning Team to accomplish an efficient and effective implementation of the Plan. These actions have been added because during the 2017 planning process, the Planning Team recognized that some of the 2005 action items were completed by the City but not as a deliberate act to implement the Mitigation Plan. The 2017 Plan's success will be ensured by the following:

- Diversity of Planning Team membership
- Quarterly implementation meetings and reporting
- Including Planning Team in review of development projects
- Sharing Mitigation Plan with Community Development Department and Public Works Department

Upon FEMA approval, the Planning Team will begin the process of incorporating existing planning mechanisms at the City level. The meetings of the Planning Team will provide an opportunity for Planning Team members to report back on the progress made on the integration of mitigation planning elements into City planning documents and procedures.

Economic Analysis of Mitigation Projects

FEMA's approach to identify the costs and benefits associated with hazard mitigation strategies, measures, or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis.

Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later.

Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating hazards can provide decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Given federal funding, the Planning Team will use a FEMA-approved benefit/cost analysis approach to identify and prioritize mitigation action items. For other projects and funding sources, the Planning Team will use other approaches to understand the costs and benefits of each action item and develop a prioritized list.

The “benefit” and “cost” of each mitigation action item was included in the Mitigation Actions Matrix located in Part III: Mitigation Strategies. A more technical assessment will be required in the event grant funding is pursued through the Hazard Mitigation Grant Program. FEMA Benefit-Cost Analysis Guidelines are discussed below.

FEMA Benefit-Cost Analysis Guidelines

The Stafford Act authorizes the President to establish a program to provide technical and financial assistance to state and local governments to assist in the implementation of hazard mitigation measures that are cost effective and designed to substantially reduce injuries, loss of life, hardship, or the risk of future damage and destruction of property. To evaluate proposed hazard mitigation projects prior to funding FEMA requires a Benefit-Cost Analysis (BCA) to validate cost effectiveness. BCA is the method by which the future benefits of a mitigation project are estimated and compared to its cost. The end result is a benefit-cost ratio (BCR), which is derived from a project’s total net benefits divided by its total project cost. The BCR is a numerical expression of the cost effectiveness of a project. A project is considered to be cost effective when the BCR is 1.0 or greater, indicating the benefits of a prospective hazard mitigation project are sufficient to justify the costs.

Although the preparation of a BCA is a technical process, FEMA has developed software, written materials, and training to support the effort and assist with estimating the expected future benefits over the useful life of a retrofit project. It is imperative to conduct a BCA early in the project development process to ensure the likelihood of meeting the cost-effective eligibility requirement in the Stafford Act.

The BCA program consists of guidelines, methodologies and software modules for a range of major natural hazards including:

- ✓ Flood (Riverine, Coastal Zone A, Coastal Zone V)
- ✓ Hurricane Wind
- ✓ Hurricane Safe Room
- ✓ Damage-Frequency Assessment
- ✓ Tornado Safe Room
- ✓ Earthquake
- ✓ Wildfire

The BCA program provides up to date program data, up to date default and standard values, user manuals and training. Overall, the program makes it easier for users and evaluators to conduct and review BCAs and to address multiple buildings and hazards in a single BCA module run.

Q&A | ELEMENT A: PLANNING PROCESS | A6

Q: A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))

A: See **Monitoring the Plan** below.

Monitoring the Plan

Under the direction of the Local Mitigation Officer, the Planning Team will take responsibility for plan maintenance and implementation. Quarterly meetings will be established to ensure the identified mitigation action items are being accomplished. On the fifth year of the planning cycle, the Planning Team will meet to evaluate the effectiveness of the planning process and to update the overall content of the Plan. The Local Mitigation Officer will coordinate with City leadership to ensure funding for 5-year updates to Plan as required by FEMA.

The Planning Team will be responsible for coordinating implementation of plan by monitoring the progress of the mitigation action items and documenting progress notes for each item. It will be up to the Local Mitigation Officer to hold either a live meeting versus tasking the coordinating agencies with status updates on their own assigned mitigation action items. The monitoring meetings will take place no less than quarterly. These meetings will provide an opportunity to discuss the progress of the action items and maintain the partnerships that are essential for the sustainability of the mitigation plan. See the **Quarterly Implementation Report** discussed below which will be a valuable tool for the Planning Team to measure the success of the Hazard Mitigation Plan. The focus of the quarterly meetings will be on the progress and changes to the Mitigation Action Items.

An equally part of the monitoring process is the need to maintain a strategic planning process which needs to include funding and organizational support. In that light, at least one year in advance of the FEMA-mandated 5-year submission of an update, the

Local Mitigation Officer will convene the Planning Team to discuss funding and timing of the update planning process.

On the fifth year of the planning cycles, the Planning Team will broaden its scope to include discussions and research on all of the sections within the Plan with particular attention given go goal achievement and public participation.

MITIGATION ACTIONS MATRIX QUARTERLY IMPLEMENTATION REPORT - _____ QUARTER, _____ YEAR													
Mitigation Action Item	**Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety**	**Timeline**	**Goal**: Protect Life and Property	**Goal**: Public Awareness	**Goal**: Natural Systems	**Goal**: Partnerships and Implementation	**Goal**: Emergency Services	**Funding Source: GF- General Fund, GR-Grant**	**Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant**	**Benefit: L-Low, M-Medium, H-High**	**Cost: L-Low, M-Medium, H-High**	**Priority: L-Low, M-Medium, H-High**	**Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes**
Multi-Hazard Mitigation Action Items													
MH-1 Integrate the goals and action items from the City of Signal Hill Hazard Mitigation Plan into existing regulatory documents and programs, where appropriate.	A, CD, PW	Ongoing	X	X	X	X	X	GF	GF	H	L	H	
MH-2 Identify and pursue funding opportunities to develop and implement local mitigation activities.	A, CD, PW	Ongoing	X	X	X			GF	GF	H	L	H	
MH-3 Enhance and implement education programs aimed at mitigating natural hazards, and reducing the risk to citizens, public agencies, private property owners,	A, PD, CS, PW	Ongoing	X	X		X	X	GF	GR	H	L	H	

MITIGATION ACTIONS MATRIX QUARTERLY IMPLEMENTATION REPORT - _____ QUARTER, _____ YEAR													
Mitigation Action Item	**Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety**	**Timeline**	**Goal**: Protect Life and Property	**Goal**: Public Awareness	**Goal**: Natural Systems	**Goal**: Partnerships and Implementation	**Goal**: Emergency Services	**Funding Source: GF- General Fund, GR-Grant**	**Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant**	**Benefit: L-Low, M-Medium, H-High**	**Cost: L-Low, M-Medium, H-High**	**Priority: L-Low, M-Medium, H-High**	**Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes**
businesses, and schools. Existing programs include CERT, Map Your Neighborhood, and American Red Cross 21 Weeks to Prepare.													
MH-4 Establish policy to ensure mitigation projects are in place to safeguard critical facilities (as identified in the General Plan Safety Element).	PW	1 year	X					GF	GF	H	L	H	
MH-5 Adopt California Building Code.	CD	Ongoing	X					GF	GF	L	L	L	
MH-6 Develop seismic inventory of at-risk City-owned buildings and infrastructure and prioritize mitigation projects.	PW, CD	2 years	X				X	GR	GR	H	H	H	

MITIGATION ACTIONS MATRIX QUARTERLY IMPLEMENTATION REPORT - _____ QUARTER, _____ YEAR													
Mitigation Action Item	**Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety**	**Timeline**	**Goal**: Protect Life and Property	**Goal**: Public Awareness	**Goal**: Natural Systems	**Goal**: Partnerships and Implementation	**Goal**: Emergency Services	**Funding Source: GF- General Fund, GR-Grant**	**Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant**	**Benefit: L-Low, M-Medium, H-High**	**Cost: L-Low, M-Medium, H-High**	**Priority: L-Low, M-Medium, H-High**	**Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes**
MH-7 Improve communication between City and County road departments produce strategies to deal with transportation infrastructure.	PW	Ongoing	X			X	X	GR	GR	H	H	H	
MH-8 Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry.	PD, PW	Ongoing		X		X	X	GF	GF	M	L	M	
MH-9 Install and improve back-up power in city owned critical facilities as cited in the GP Safety Element.	PW	Ongoing					X	GF	GF	H	H	H	

MITIGATION ACTIONS MATRIX QUARTERLY IMPLEMENTATION REPORT - _____ QUARTER, _____ YEAR													
Mitigation Action Item	**Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety**	**Timeline**	**Goal**: Protect Life and Property	**Goal**: Public Awareness	**Goal**: Natural Systems	**Goal**: Partnerships and Implementation	**Goal**: Emergency Services	**Funding Source: GF- General Fund, GR-Grant**	**Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant**	**Benefit: L-Low, M-Medium, H-High**	**Cost: L-Low, M-Medium, H-High**	**Priority: L-Low, M-Medium, H-High**	**Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes**
MH-10 Continue to encourage the development of mutual aid systems between Signal Hill and surrounding cities for emergency building assessment, CERT training, etc.	PW/PD	Ongoing	X			X	X	GF	GF	H	M	M	
MH-11 Promote public education and outreach to increase awareness of hazards and opportunities for mitigation. Continue to stock brochures from American Red Cross, FEMA, and Cal OES about preparedness and home mitigation.	PD	Ongoing	X	X				GF	GF	H	M	M	
MH-12 Distribute information about	F CD	1 year	X	X				GF	GF	H	M	M	

MITIGATION ACTIONS MATRIX QUARTERLY IMPLEMENTATION REPORT - _____ QUARTER, _____ YEAR													
Mitigation Action Item	**Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety**	**Timeline**	**Goal**: Protect Life and Property	**Goal**: Public Awareness	**Goal**: Natural Systems	**Goal**: Partnerships and Implementation	**Goal**: Emergency Services	**Funding Source: GF- General Fund, GR-Grant**	**Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant**	**Benefit: L-Low, M-Medium, H-High**	**Cost: L-Low, M-Medium, H-High**	**Priority: L-Low, M-Medium, H-High**	**Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes**
evacuation route maps.													
MH-13 Post the Hazard Mitigation Plan on the City's website.	A	Ongoing		X				GF	GF	H	M	M	
MH-14 Maintain primary and alternate Emergency Operations Centers.	PD	Ongoing	X	X			X	GF	GF	H	M	M	
MH-15 Continue to provide informational literature on animal disaster plans and supply kits.	CS	Ongoing	X	X				GF	GF	H	M	M	
MH-16 Encourage the American Red Cross to hold a variety of courses, including: CPR, Basic First Aid, Introduction to Disaster Services, Mass Care, Shelter Operations, babysitting, Healthcare	CS	Ongoing	X	X		X	X	GF	GF	M	L	L	

MITIGATION ACTIONS MATRIX QUARTERLY IMPLEMENTATION REPORT - _____ QUARTER, _____ YEAR													
Mitigation Action Item	**Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety**	**Timeline**	**Goal**: Protect Life and Property	**Goal**: Public Awareness	**Goal**: Natural Systems	**Goal**: Partnerships and Implementation	**Goal**: Emergency Services	**Funding Source: GF- General Fund, GR-Grant**	**Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant**	**Benefit: L-Low, M-Medium, H-High**	**Cost: L-Low, M-Medium, H-High**	**Priority: L-Low, M-Medium, H-High**	**Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes**
Provider, pet first-aid and others at the Red Cross Office and at other locations throughout the City.													
MH-17 Involve Hazard Mitigation Planning Team in review of future updates of the City General Plan or Zoning Ordinance to ensure consideration of threats posed by hazards.	CD	Ongoing	X	X	X		X	GF	GF	M	L	M	
MH-18 Identify and prioritize needs for additional shelter supplies for City employees to include but not limited to additional cots, blankets and shelter kits.	CS	Ongoing	X				X	GF	GF	H	M	M	
MH-19 Teach CERT classes to	PD	Ongoing	X	X			X	GR	GR	H	H	H	

MITIGATION ACTIONS MATRIX QUARTERLY IMPLEMENTATION REPORT - _____ QUARTER, _____ YEAR													
Mitigation Action Item	**Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety**	**Timeline**	**Goal**: Protect Life and Property	**Goal**: Public Awareness	**Goal**: Natural Systems	**Goal**: Partnerships and Implementation	**Goal**: Emergency Services	**Funding Source: GF- General Fund, GR-Grant**	**Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant**	**Benefit: L-Low, M-Medium, H-High**	**Cost: L-Low, M-Medium, H-High**	**Priority: L-Low, M-Medium, H-High**	**Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes**
interested citizens in the City and CITY employees to assist their neighbors during emergencies. This course will be taught utilizing City staff and resources independent of Los Angeles Co. Fire. Promote CERT through the Chamber of Commerce to gain business participation.													
MH-20 Train, law enforcement, public works, CERT members and other support personnel in the Incident Command System.	PD	Ongoing	X	X	X	X	X	GF	GF	M	H	M	
MH-21 Provide copies of the Hazard Mitigation Plan to the	A	Completed	X		X			n/a	n/a	n/a	n/a	n/a	

MITIGATION ACTIONS MATRIX QUARTERLY IMPLEMENTATION REPORT - _____ QUARTER, _____ YEAR													
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Community Development Department for their information during new development considerations.													
MH-22 The Community Development Department will review the General Plan to ensure that designated growth areas are not in high hazard areas identified in this plan.	CD	Completed	X		X			n/a	n/a	n/a	n/a	n/a	
MH-23 Review and update all annexes of the City's Emergency Operations Plan. Include participation from all departments and outside providers of	PD	Completed 2016	X	X		X	X	n/a	n/a	n/a	n/a	n/a	

MITIGATION ACTIONS MATRIX QUARTERLY IMPLEMENTATION REPORT - _____ QUARTER, _____ YEAR													
Mitigation Action Item	**Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety**	**Timeline**	**Goal**: Protect Life and Property	**Goal**: Public Awareness	**Goal**: Natural Systems	**Goal**: Partnerships and Implementation	**Goal**: Emergency Services	**Funding Source: GF- General Fund, GR-Grant**	**Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant**	**Benefit: L-Low, M-Medium, H-High**	**Cost: L-Low, M-Medium, H-High**	**Priority: L-Low, M-Medium, H-High**	**Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes**
emergency services in the update process.													
MH-24 Build a new E911 Communications Center or ECC in conjunction with the construction of a new VHF-trunked radio system. The new system will feature a combined ECC dispatch facility with a ten (10) workstation design to serve all public safety and local government agencies. The center's operation will be CAD based with Enhanced 9-1-1 interface that includes hard wire and wireless call number and location	PD	Completed 2013					X	n/a	n/a	n/a	n/a	n/a	

MITIGATION ACTIONS MATRIX QUARTERLY IMPLEMENTATION REPORT - _____ QUARTER, _____ YEAR													
Mitigation Action Item	**Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety**	**Timeline**	**Goal**: Protect Life and Property	**Goal**: Public Awareness	**Goal**: Natural Systems	**Goal**: Partnerships and Implementation	**Goal**: Emergency Services	**Funding Source: GF- General Fund, GR-Grant**	**Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant**	**Benefit: L-Low, M-Medium, H-High**	**Cost: L-Low, M-Medium, H-High**	**Priority: L-Low, M-Medium, H-High**	**Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes**
identification using a GIS/GPS digital mapping component. An optional feature for mobile units will include mobile data transmission capability using mobile mounted laptops to provide rapid access to information critical to most emergency response incidents.													
MH-25 Ensure that when ECC/911 system upgrade is completed, there is a capability to communicate with all EOC agencies with redundant backups in voice and data communications.	PD	3 years	X				X	GF	GF	H	H	H	
MH-26 Establish an offsite	PD	Completed	X				X	n/a	n/a	n/a	n/a	n/a	

MITIGATION ACTIONS MATRIX QUARTERLY IMPLEMENTATION REPORT - _____ QUARTER, _____ YEAR													
Mitigation Action Item	**Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety**	**Timeline**	**Goal**: Protect Life and Property	**Goal**: Public Awareness	**Goal**: Natural Systems	**Goal**: Partnerships and Implementation	**Goal**: Emergency Services	**Funding Source: GF- General Fund, GR-Grant**	**Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant**	**Benefit: L-Low, M-Medium, H-High**	**Cost: L-Low, M-Medium, H-High**	**Priority: L-Low, M-Medium, H-High**	**Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes**
Emergency Communications Center (ECC), alternate Emergency Operations Center (EOC) at Public Works, and purchase and equip Mobile Command Center. In the event the primary sites must be vacated, the off-site back-up centers can be rapidly mobilized in a secured facility. Both centers will duplicate the primary points of operation.													
MH-27 Work with Volunteer Organizations Active in Disasters (VOAD), American Red Cross, and Salvation Army to ensure	PD	Completed	X	X		X	X	n/a	n/a	n/a	n/a	n/a	

MITIGATION ACTIONS MATRIX QUARTERLY IMPLEMENTATION REPORT - _____ QUARTER, _____ YEAR													
Mitigation Action Item	**Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety**	**Timeline**	**Goal**: Protect Life and Property	**Goal**: Public Awareness	**Goal**: Natural Systems	**Goal**: Partnerships and Implementation	**Goal**: Emergency Services	**Funding Source: GF- General Fund, GR-Grant**	**Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant**	**Benefit: L-Low, M-Medium, H-High**	**Cost: L-Low, M-Medium, H-High**	**Priority: L-Low, M-Medium, H-High**	**Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes**
representation on the EOP Committee.													
MH-28 Conduct joint exercise with school district and other special districts located within the City boundaries.	PD	Completed	X	X		X	X	n/a	n/a	n/a	n/a	n/a	
MH-29 Ensure that the actions and findings of the LEPC are incorporated into the City EOP and Mitigation Plan updates and revisions.	A	Completed				X		n/a	n/a	n/a	n/a	n/a	
MH-30 Ensure training and exercise standards are maintained (as established in the Standardized Emergency Management System).	PD	Completed	X	X		X	X	n/a	n/a	n/a	n/a	n/a	

MITIGATION ACTIONS MATRIX QUARTERLY IMPLEMENTATION REPORT - _____ QUARTER, _____ YEAR													
Mitigation Action Item	**Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety**	**Timeline**	**Goal**: Protect Life and Property	**Goal**: Public Awareness	**Goal**: Natural Systems	**Goal**: Partnerships and Implementation	**Goal**: Emergency Services	**Funding Source: GF- General Fund, GR-Grant**	**Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant**	**Benefit: L-Low, M-Medium, H-High**	**Cost: L-Low, M-Medium, H-High**	**Priority: L-Low, M-Medium, H-High**	**Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes**
MH-31 Amend job description of Emergency Operations Coordinator to include leading the City's Hazard Mitigation Advisory Committee in developing a sustainable process for implementing, monitoring, and evaluating the mitigation activities.		Ongoing		X	X	X	X	GF	GF	M	M	M	
MH-32 Familiarize City Finance staff of requirements regarding public assistance (disaster cost recovery) following a declared disaster.	F, PD	Ongoing	X	X		X	X	GF	GF	H	L	H	
MH-33 Identify opportunities for partnering with citizens, private	A	Ongoing	X	X	X	X	X	GF	GF	H	L	H	

MITIGATION ACTIONS MATRIX QUARTERLY IMPLEMENTATION REPORT - _____ QUARTER, _____ YEAR													
Mitigation Action Item	**Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety**	**Timeline**	**Goal**: Protect Life and Property	**Goal**: Public Awareness	**Goal**: Natural Systems	**Goal**: Partnerships and Implementation	**Goal**: Emergency Services	**Funding Source: GF- General Fund, GR-Grant**	**Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant**	**Benefit: L-Low, M-Medium, H-High**	**Cost: L-Low, M-Medium, H-High**	**Priority: L-Low, M-Medium, H-High**	**Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes**
contractors, and other jurisdictions to increase availability of equipment and manpower for efficiency of response efforts.													
MH-34 Enhance weather monitoring to attain earlier severe storm warnings.	PW	Ongoing	X	X	X	X	X	GF	GF	H	L	M	
MH-35 Routine maintenance of the community's infrastructure will be done to minimize the potential for system failure because of or during a disaster.	PW	Ongoing	X	X	X	X	X	GF	GF	H	L	H	
MH-36 Assess availability of backup power resources (e.g. generators, solar, etc.) of medical	PD	Ongoing	X	X		X	X	GR	GR	H	H	H	

MITIGATION ACTIONS MATRIX QUARTERLY IMPLEMENTATION REPORT - _____ QUARTER, _____ YEAR													
Mitigation Action Item	**Coordinating Agency: A-Administration, CD-Community Development, CS-Community Services, PW-Public Works, F-Finance, BS-Building Safety**	**Timeline**	**Goal**: Protect Life and Property	**Goal**: Public Awareness	**Goal**: Natural Systems	**Goal**: Partnerships and Implementation	**Goal**: Emergency Services	**Funding Source: GF- General Fund, GR-Grant**	**Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant**	**Benefit: L-Low, M-Medium, H-High**	**Cost: L-Low, M-Medium, H-High**	**Priority: L-Low, M-Medium, H-High**	**Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes**
facility, nursing homes, and fire, police, rescue, and emergency management personnel; upgrade resources as necessary.													
MH-37 Implement the National Incident Management System (NIMS) in each City department.	PD	Completed	X	X	X	X	X	n/a	n/a	n/a	n/a	n/a	
MH-38 Develop comprehensive all hazards debris management plan.	PW	2 years	X	X	X	X	X	GR	GR	H	H	H	
MH-39 Educate the public about hazards prevalent to their area utilizing Map Your Neighborhood.	PD, A	Ongoing		X		X		GF	GF	H	L	H	
MH-40 Purchased and trained EOC staff on Veoci – an emergency management software	PD	Completed	X		X	X	X	n/a	n/a	n/a	n/a	n/a	

MITIGATION ACTIONS MATRIX QUARTERLY IMPLEMENTATION REPORT - _____ QUARTER, _____ YEAR													
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program.													
MH-41 Establish agreements with vendors for use of services, equipment, and/or facilities following a disaster.	F, PD	1 year	X	X	X	X	X	GF	GF	H	L	M	
MH-42 Identify funding sources for structural and non-structural retrofitting of City-owned structures that are identified as vulnerable to seismic, flooding, and other hazards.	PW	1 year	X	X	X	X	X	GR	GR	H	H	H	
MH-43 Encourage purchase of hazard insurances including earthquake and flood.	A	1 year		X		X		GF	GF	H	L	M	
MH-44 Secure grant funding to	CD/PW	3 years	X		X		X	GR	GR	H	M	H	

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conduct traffic study and engineering report on impact of hazardous material related heavy equipment movement on city street infrastructure.													
MH-45 Secure grant funding for city based CERT training program and ongoing equipment procurement.	PD	3 years	X	X		X	X	GR	GR	H	H	H	
Earthquake Mitigation Action Items													
EQ-1 Encourage reduction of non-structural and structural earthquake hazards in homes, schools, and businesses.	CD	Ongoing	X	X		X	X	GF	GF	H	L	M	
EQ-2 Encourage purchase of	A	1 year		X		X							

MITIGATION ACTIONS MATRIX QUARTERLY IMPLEMENTATION REPORT - _____ QUARTER, _____ YEAR													
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earthquake hazard insurance.													
EQ-3 As updates become available, integrate new earthquake hazard mapping data for the City and improve technical analysis of earthquake hazards.	CD	Ongoing		X		X	X	GR	GR	H	H	H	
EQ-4 Secure grant funding for updated Technical Background Report associated with the General Plan Safety Element.	CD	5 years	X	X	X		X	GR	GR	H	H	H	
Landslide Mitigation Action Items													
LS-1 Improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard-	BS	Ongoing	X	X	X	X	X	GF	GF	H	H	H	

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prone areas.													
LS-2 Encourage construction and subdivision design that can be applied to steep slopes to reduce the potential adverse impacts from development	BS	Ongoing	X					GF	GF	M	M	M	
LS-3 Limit activities in identified potential and historical landslide areas through regulation and public outreach.	CD	Ongoing	X	X	X	X	X	GF	GF	H	L	M	
Windstorm Mitigation Action Items													
WS-1 Support/encourage electrical utilities to use underground construction methods where possible to reduce power outages	PW	Ongoing	X	X			X	GF	GF	H	L	M	

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from windstorms.													
WS-2 Monitor trees and branches in public areas at risk of breaking or falling in wind and sand storms. Prune or thin trees or branches when they would pose an immediate threat to property, utility lines or other significant structures or critical facilities in the community.	PW	Annual	X	X	X		X	GF	GF	M	M	M	
Drought Mitigation Action Items													
DR-1 Distribute information to all property owners and renters on the importance of water conservation and different venues of purchasing	PW	Ongoing		X	X			GF	GF	H	L	M	

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water saving mechanisms for homes and businesses.													
DR-2 Investigate possibility of extending (deepening) existing water wells.	PW	Completed	X			X	X	n/a	n/a	n/a	n/a	n/a	
DR-3 Identify water resources management and conservation opportunities.	PW	Ongoing	X	X	X	X	X	GF	GF	H	L	H	
DR-4 Implement use of recycled water to supplement imported/local water sources.	PW	Ongoing	X	X	X	X	X	GF	GF	H	M	H	
DR-5 Practice water conservation by building demonstration gardens and retrofit public parks.	PW	Ongoing	X	X	X	X	X	GF	GF	H	M	H	
DR-6 Write 20X2020 Water	PW	1 year	X	X	X	X	X	GF	GF	H	M	H	

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Conservation Plan.													

Q&A | ELEMENT A: PLANNING PROCESS | A6

Q: A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))

A: See **Evaluating and Updating the Plan** below.

Evaluating and Updating the Plan

Formal Update Process

The Mitigation Plan will be monitored on a quarterly basis to determine the effectiveness of mitigation action items and to reflect changes in land development or programs that may affect mitigation actions or their priorities. The evaluation process includes a firm schedule and timeline, and identifies the agencies and organizations participating in plan evaluation. The Local Mitigation Officer or designee will be responsible for contacting the Planning Team members and organizing the quarterly meeting. Planning Team members will also be responsible for participating in the formal update to the Plan every fifth year of the planning cycle.

The Planning Team will review the goals and mitigation action items to determine their relevance to changing situations in the City, as well as changes in State or Federal policy, and to ensure they are addressing current and expected conditions. The Planning Team will also review the Plan's **Risk Assessment** portion of the Plan to determine if this information should be updated or modified, given any new available data. The **coordinating organizations** responsible for the various action items will report on the status of their projects, including the success of various implementation processes, difficulties encountered, success of coordination efforts, and which strategies should be revised. Amending will be made to the Mitigation Actions Matrix and other sections in the Plan as deemed necessary by the Planning Team.

Q&A | ELEMENT A: PLANNING PROCESS | A5

Q: A5. Is there discussion of how the community will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))

A: See **Continued Public Involvement** below.

Continued Public Involvement

The City of Signal Hill is dedicated to involving the public directly in the continual review and updates to the Mitigation Plan. Copies of the plan will be catalogued and made available at City Hall and at all City operated public libraries. The existence and location of these copies will be publicized in City newsletters and on the City website. This site will also contain an email address and phone number where people can direct their comments and concerns. A public meeting will also be held after each evaluation or when deemed necessary by the Planning Team. The meetings will provide the public a forum in which they can express their concerns, opinions, or ideas about the Plan.

The Local Mitigation Officer will be responsible for using City resources to publicize the annual public meetings and maintain public involvement through the public access channel, web page, and newspapers.

PART IV: APPENDIX

General Hazard Overviews

Earthquake Hazards

Measuring and Describing Earthquakes

An earthquake is a sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of the Earth's tectonic plates. The effects of an earthquake can be felt far beyond the site of its occurrence. They usually occur without warning and, after just a few seconds, can cause massive damage and extensive casualties. Common effects of earthquakes are ground motion and shaking, surface fault ruptures, and ground failure. Ground motion is the vibration or shaking of the ground during an earthquake. When a fault ruptures, seismic waves radiate, causing the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter. Soft soils can further amplify ground motions. The severity of these effects is dependent on the amount of energy released from the fault or epicenter. One way to express an earthquake's severity is to compare its acceleration to the normal acceleration due to gravity. The acceleration due to gravity is often called "g". A ground motion with a peak ground acceleration of 100%g is very severe. Peak Ground Acceleration (PGA) is a measure of the strength of ground motion. PGA is used to project the risk of damage from future earthquakes by showing earthquake ground motions that have a specified probability (10%, 5%, or 2%) of being exceeded in 50 years. These ground motion values are used for reference in construction design for earthquake resistance. The ground motion values can also be used to assess relative hazard between sites, when making economic and safety decisions.

When a fault ruptures, seismic waves radiate, causing the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter.

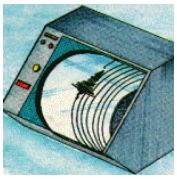
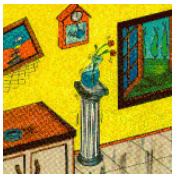
Another tool used to describe earthquake intensity is the Magnitude Scale. The Magnitude Scale is sometimes referred to as the Richter Scale. The two are similar but not exactly the same. The Magnitude Scale was devised as a means of rating earthquake strength and is an indirect measure of seismic energy released. The Scale is logarithmic with each one-point increase corresponding to a 10-fold increase in the amplitude of the seismic shock waves generated by the earthquake. In terms of actual energy released, however, each one-point increase on the Richter scale corresponds to about a 32-fold increase in energy released. Therefore, a Magnitude 7 (M7) earthquake is 100 times (10 X 10) more powerful than a M5 earthquake and releases 1,024 times (32 X 32) the energy.

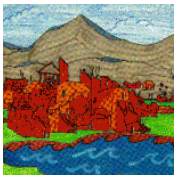
An earthquake generates different types of seismic shock waves that travel outward from the focus or point of rupture on a fault. Seismic waves that travel through the earth's crust are called body waves and are divided into primary (P) and secondary (S) waves. Because P waves move faster (1.7 times) than S waves, they arrive at the seismograph first. By measuring the time delay between arrival of the P and S waves and knowing the distance to the epicenter, seismologists can compute the magnitude for the earthquake.

The duration of an earthquake is related to its magnitude but not in a perfectly strict sense. There are two ways to think about the duration of an earthquake. The first is the length of time it takes for the fault to rupture and the second is the length of time shaking is felt at any given point (e.g. when someone says "I felt it shake for 10 seconds" they are making a statement about the duration of shaking). (Source: www.usgs.gov)

The Modified Mercalli Scale (MMI) is another means for rating earthquakes, but one that attempts to quantify intensity of ground shaking. Intensity under this scale is a function of distance from the epicenter (the closer to the epicenter the greater the intensity), ground acceleration, duration of ground shaking, and degree of structural damage. The Modified Mercalli Intensity Scale below rates the level of severity of an earthquake by the amount of damage and perceived shaking.

Table: Modified Mercalli Intensity Scale

	MMI Value	Description of Shaking Severity	Summary Damage Description Used on 1995 Maps	Full Description
	I			Not Felt
	II			Felt by persons at rest, on upper floors, or favorably placed.
	III			Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
	IV			Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing motorcars rock. Windows, dishes, doors rattle. In the upper range of IV, wooden walls and frame creak.
	V	Light	Pictures Move	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clock stop, start, change rate.

	MMI Value	Description of Shaking Severity	Summary Damage Description Used on 1995 Maps	Full Description
	VI	Moderate	Objects Fall	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and masonry D cracked.
	VII	Strong	Nonstructural Damage	Difficult to stand. Noticed by drivers of motorcars. Hanging objects quiver. Furniture broken. Damage to masonry, including cracks. Weak chimneys broken at roofline. Fall of plaster, loose bricks, stones, tiles, cornices. Some cracks in masonry C. Small slides and caving in along sand or gravel banks. Concrete irrigation ditches damaged.
	VIII	Very Strong	Moderate Damage	Steering of motorcars affected. Damage to masonry C, partial collapse. Some damage to masonry B; none to masonry A. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, and elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Cracks in wet ground and on steep slopes.
	IX	Violent	Heavy damage	General panic. Damage to masonry buildings ranges from collapse to serious damage unless modern design. Wood-frame structures rack, and, if not bolted, shifted off foundations. Underground pipes broken.
	X	Very Violent	Extreme Damage	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land.
	XI			Rails bent greatly. Underground pipelines completely out of services.

	MMI Value	Description of Shaking Severity	Summary Damage Description Used on 1995 Maps	Full Description
	XII			Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into air.

Earthquake Related Hazards

Ground shaking, landslides, liquefaction, and amplification are the specific hazards associated with earthquakes. The severity of these hazards depends on several factors, including soil and slope conditions, proximity to the fault, earthquake magnitude, and the type of earthquake.

Ground Shaking

Ground shaking is the motion felt on the earth's surface caused by seismic waves generated by the earthquake. It is the primary cause of earthquake damage. The strength of ground shaking depends on the magnitude of the earthquake, the type of fault, and distance from the epicenter (where the earthquake originates). Buildings on poorly consolidated and thick soils will typically see more damage than buildings on consolidated soils and bedrock.

Seismic activity along nearby or more distant fault zones are likely to cause ground shaking within the City limits.

Earthquake-Induced Landslide Potential

Generally, these types of failures consist of rock falls, disrupted soil slides, rock slides, soil lateral spreads, soil slumps, soil block slides, and soil avalanches. Areas having the potential for earthquake-induced landslides generally occur in areas of previous landslide movement, or where local topographic, geological, geotechnical, and subsurface water conditions indicate a potential for permanent ground displacements.

Liquefaction

Liquefaction occurs when ground shaking causes wet granular soils to change from a solid state to a liquid state. This results in the loss of soil strength and the soil's ability to support weight. Buildings and their occupants are at risk when the ground can no longer support these structures. Liquefaction generally occurs during significant earthquake activity, and structures located on soils such as silt or sand may experience significant damage during an earthquake due to the instability of structural foundations and the moving earth. Many communities in Southern California are built on ancient river bottoms and have sandy soil. In some cases, the soil may be subject to liquefaction, depending on the depth of the water table.

Landslide Hazards

Hazard Characteristics

Landslides are a serious geologic hazard in almost every state in America. Nationally, landslides cause 25 to 50 deaths each year. The best estimate of direct and indirect costs of landslide damage in the United States range between $1 and $2 billion annually. As a seismically active region, California has a significant number of locations impacted by landslides. Some landslides result in private property damage; other landslides impact transportation corridors, fuel and energy conduits, and communication facilities. They can also pose a serious threat to human life.

Landslides can be broken down into two categories: 1) rapidly moving (generally known as debris flows), and; 2) slow moving. Rapidly moving landslides or debris flows present the greatest risk to human life, and people living in or traveling through areas prone to rapidly moving landslides, are at increased risk of serious injury. Slow moving landslides can cause significant property damage, but are less likely to result in serious human injuries.

The primary effects of mudslides/landslides include: abrupt depression and lateral displacement of hillside surfaces over distances of up to several hundreds of feet, disruption of surface drainage, blockage of flood control channels and roadways, displacement or destruction of improvements such as roadways, buildings, and water wells.

Historic Southern California Landslides

1928 St. Francis Dam

Cost, $672.1 million (2000 Dollars) The dam, located in Los Angeles County, gave way on March 12, and its waters swept through the Santa Clara Valley toward the Pacific Ocean, about 54 miles away. Sixty-five miles of valley was devastated, and over 500 people were killed.

1956 Portuguese Bend

Cost, $14.6 million (2000 Dollars) California Highway 14, Palos Verdes Hills. Land use on the Palos Verdes Peninsula consists mostly of single-family homes built on large lots, many of which have panoramic ocean views. All of the houses were constructed with individual septic systems, generally consisting of septic tanks and seepage pits. Landslides have been active here for thousands of years, but recent landslide activity has been attributed in part to human activity. The Portuguese Bend Landslide began its modern movement in August 1956, when displacement was noticed at its northeast margin. Movement gradually extended downslope so that the entire eastern edge of the slide mass was moving within 6 weeks. By the summer of 1957, the entire slide mass was sliding towards the sea.

1958-1971 Pacific Palisades

Cost, $29.1 million (2000 Dollars) California Highway 1 and house damaged.

1961 Mulholland Cut

Cost, $41.5 million (2000 Dollars) On Interstate 405, 11 miles north of Santa Monica, Los Angeles County.

1963 Baldwin Hills Dam

Cost, $50 million (1963 Dollars) On December 14, the 650-foot-long by 155-foot-high earth fill dam gave way and sent 360 million gallons of water in a 50-foot-high wall cascading onto the community below, killing five persons.

1969 Glendora

Cost, $26.9 million (2000 Dollars) Los Angeles County, 175 houses damaged, mainly by debris flows.

1969 Seventh Ave., Los Angeles County

Cost, $14.6 million (2000 Dollars) California Highway 60.

1970 Princess Park

Cost, $29.1 million (2000 Dollars) California Highway 14, ten miles north of Newhall, near Saugus, northern Los Angeles County.

1971 Upper and Lower Van Norman Dams, San Fernando

Cost, $302.4 million (2000 Dollars) Earthquake-induced landslides. Damage due to the February 9, 1971, Magnitude 7.5 San Fernando, Earthquake.
The earthquake of February 9 severely damaged the Upper and Lower Van Norman Dams.

1971 Juvenile Hall, San Fernando

Cost, $266.6 million (2000 Dollars) Landslides caused by the February 9, 1971, San Fernando earthquake. In addition to damaging the San Fernando Juvenile Hall, this 1.2 km-long slide damaged trunk lines of the Southern Pacific Railroad, San Fernando Boulevard, Interstate Highway 5, the Sylmar electrical converter station, and several pipelines and canals.

1977-1980 Monterey Park, Repetto Hills, Los Angeles County

Cost, $14.6 million (2000 Dollars) 100 houses damaged in 1980 due to debris flows.

1978 Bluebird Canyon Orange County

Cost, $52.7 million (2000 Dollars) October 2, 60 houses destroyed or damaged. Unusually heavy rains in March of 1978 may have contributed to initiation of the landslide. Although the 1978 slide area was approximately 3.5 acres, it is suspected to be a portion of a larger, ancient landslide.

1979 Big Rock, California, Los Angeles County

Cost, $1.08 billion (2000 Dollars) California Highway 1 rockslide.

1980 Southern California Slides

Cost, $1.1 billion in damage (2000 Dollars) Heavy winter rainfall in 1979-90 caused damage in six Southern California counties. In 1980, the rainstorm started on February 8. A sequence of 5

days of continuous rain and 7 inches of precipitation had occurred by February 14. Slope failures were beginning to develop by February 15 and then very high-intensity rainfall occurred on February 16. As much as eight inches of rain fell in a six-hour period in many locations. Records and personal observations in the field on February 16 and 17 showed that the mountains and slopes literally fell apart on those two days.

1983 San Clemente, Orange County

Cost, $65 million (2000 Dollars), California Highway 1. Litigation at that time involved approximately $43.7 million (2000).

1983 Big Rock Mesa

Cost, $706 million (2000 Dollars) in legal claims condemnation of 13 houses, and 300 more threatened rockslide caused by rainfall.

1978-1980 San Diego County

Experienced major damage from storms in 1978, 1979, and 1979-80, as did neighboring areas of Los Angeles and Orange County. One hundred and twenty landslides were reported to have occurred in San Diego County during these 2 years. Rainfall for the rainy seasons of 78-79 and 79-80 was 14.82 and 15.61 inches (37.6 and 39.6 cm) respectively, compared to a 125-year average (1850-1975) of 9.71 inches (24.7 cm). Significant landslides occurred in the Friars Formation, a unit that was noted as slide-prone in the Seismic Safety Study for the City of San Diego. Of the nine landslides that caused damage in excess of $1 million, seven occurred in the Friars Formation, and two in the Santiago Formation in the northern part of San Diego County.

1994 Northridge Earthquake Landslides

As a result of the Magnitude 6.7 Northridge Earthquake, more than 11,000 landslides occurred over an area of 10,000 km^2. Most were in the Santa Susana Mountains and in mountains north of the Santa Clara River Valley. Destroyed dozens of homes, blocked roads, and damaged oil-field infrastructure. Caused deaths from Coccidioidomycosis (valley fever) the spore of which was released from the soil and blown toward the coastal populated areas. The spore was released from the soil by the landslide activity.

March 1995 Los Angeles and Ventura Counties

Above normal rainfall triggered damaging debris flows, deep-seated landslides, and flooding. Several deep-seated landslides were triggered by the storms, the most notable was the La Conchita landslide, which in combination with a local debris flow, destroyed or badly damaged 11 to 12 homes in the small town of La Conchita, about 20 km west of Ventura. There also was widespread debris-flow and flood damage to homes, commercial buildings, and roads and highways in areas along the Malibu coast that had been devastated by wildfire two years before.

January 2005 Ventura County

On January 10, 2005, a landslide once again struck the community of La Conchita, killing ten people and destroying or seriously damaging 36 houses.

Landslide Characteristics

What is a landslide?

"A landslide is defined as, the movement of a mass of rock, debris, or earth movement down a slope. Landslides are a type of "mass wasting" which denotes any down slope movement of soil and rock under the direct influence of gravity. The term "landslide" encompasses events such as rock falls, topples, slides, spreads, and flows.

Landslides are initiated by rainfall, earthquakes, volcanic activity, changes in groundwater, disturbance and change of a slope by human-caused construction activities, or any combination of these factors. Landslides also occur underwater, causing tidal waves and damage to coastal areas. These landslides are called submarine landslides."

The size of a landslide usually depends on the geology and the initial cause of the landslide. Landslides vary greatly in their volume of rock and soil, the length, width, and depth of the area affected, frequency of occurrence, and speed of movement. Some characteristics that determine the type of landslide are slope of the hillside, moisture content, and the nature of the underlying materials. Landslides are given different names, depending on the type of failure, and their composition and characteristics.

Slides move in contact with the underlying surface. These movements include rotational slides where sliding material moves along a curved surface and translational slides where movement occurs along a flat surface. These slides are generally slow moving and can be deep. Slumps are small rotational slides that are generally shallow. Slow-moving landslides occur on relatively gentle slopes and cause significant property damage, but are far less likely to result in serious injuries than rapidly moving landslides.

What is a Debris Flow?

A debris or mud flow is a river of rock, earth and other materials, including vegetation that is saturated with water. This high percentage of water gives the debris flow a very rapid rate of movement down a slope. Debris flows move with speeds greater than 20 miles per hour, and often move much faster. This high rate of speed makes debris flows extremely dangerous to people and property in its path.

Areas Particularly Susceptible to Landslides

Locations at risk from landslides or debris flows include areas with one or more of the following conditions:

- ✓ On or close to steep hills
- ✓ Steep road-cuts or excavations
- ✓ Existing landslides or places of known historic landslides (such sites often have tilted power lines, trees tilted in various directions, cracks in the ground, and irregular-surfaced ground)
- ✓ Steep areas where surface runoff is channeled, such as below culverts, V-shaped valleys, canyon bottoms, and steep stream channels
- ✓ Fan-shaped areas of sediment and boulder accumulation at the outlets of canyons
- ✓ Canyon areas below hillside and mountains that recently (within 1-6 years) were subjected to a wildland fire

Excavation and Grading

Slope excavation is common in the development of home sites or roads on sloping terrain. Grading these slopes results in slopes that are steeper than the pre-existing natural slopes. Since slope steepness is a major factor in landslides, these steeper slopes are at an increased risk for landslides.

The added weight of fill placed on slopes also results in an increased landslide hazard. Small landslides are fairly common along roads, in either the road cut or the road fill. Landslides occurring below new construction sites are indicators of the potential impacts stemming from excavation.

Drainage and Groundwater Alterations

Water flowing through or above ground, is often the trigger for landslides. Any activity that increases the amount of water flowing into landslide-prone slopes increases landslide hazards. Broken or leaking water or sewer lines can be especially problematic, as does water retention facilities that direct water onto slopes. However, even lawn irrigation in landslide prone locations results in damaging landslides. Ineffective storm water management and excess runoff also cause erosion, and increase the risk of landslide hazards. Drainage is affected, naturally by the geology and topography of an area. Development that results in an increase in impervious surface impairs the ability of the land to absorb water and redirects water to other areas. Channels, streams, ponding, and erosion on slopes indicate potential slope problems.

Road and driveway drains, gutters, downspouts, and other constructed drainage facilities concentrates and accelerates flow. Ground saturation and concentrated velocity flow are major causes of slope problems and triggers landslides.

Changes in Vegetation

Removing vegetation from very steep slopes increases landslide hazards. Areas that experience wildfire and land clearing for development may have long periods of increased landslide hazard. Also, certain types of ground cover require constant watering to remain green. Changing away from native ground cover plants increases the risk of landslide.

Windstorm Hazards

Hazard Characteristics

Santa Ana wind conditions results in two general disaster conditions. The most common is fire fanned by the high winds. This was the situation in 1993 in Laguna Beach when a massive fire destroyed a number of homes in the surrounding hills. Wind driven flames again caused the destruction of more than 3,000 homes in Southern California in October of 2003. Other forms of disaster would be direct building damage, damage to utilities and infrastructure as a result of the high winds. This has occurred in the past few years in many southland communities including Los Angeles County.

Santa Ana winds commonly occur between October and February, with December having the highest frequency of events. Summer events are rare. Wind speeds are typically north to east at 35 knots through and below passes, and canyons with gusts to 50 knots. Stronger Santa Ana winds has gusts greater than 60 knots over widespread areas, and gusts greater than 100 knots in favored areas. Frequently, the strongest winds in the basin occur during the night and morning hours due to the absence of a sea breeze. The sea breeze which typically blows onshore daily, can moderate the Santa Ana winds during the late morning and afternoon hours. Santa Ana winds are an important forecast challenge because of the high fire danger associated with them. Also, unusually high surf conditions on the northeast side of the Channel Islands normally accompany a Santa Ana event.

The Beaufort Scale below, coined and developed by Sir Francis Beaufort in 1805, illustrates the effect that varying wind speed can have on sea swells and structures:

Table: Beaufort Scale
(Source : NOAA Storm Center)

Beaufort Force	Speed (mph)	Wind Description - State of Sea - Effects on Land
0	Less 1	Calm - Mirror-like - Smoke rises vertically
1	1-3	Light - Air Ripples look like scales; No crests of foam - Smoke drift shows direction of wind, but wind vanes do not
2	4-7	Light Breeze - Small but pronounced wavelets; Crests do not break - Wind vanes move; Leaves rustle; You can feel wind on the face
3	8-12	Gentle Breeze - Large Wavelets; Crests break; Glassy foam; A few whitecaps - Leaves and small twigs move constantly; Small, light flags are extended
4	13-18	Moderate Breeze - Longer waves; Whitecaps - Wind lifts dust and loose paper; Small branches move
5	19-24	Fresh Breeze - Moderate, long waves; Many whitecaps; Some spray - Small trees

Beaufort Force	Speed (mph)	Wind Description - State of Sea - Effects on Land
		with leaves begin to move
6	25-31	Strong Breeze - Some large waves; Crests of white foam; Spray - Large branches move; Telegraph wires whistle; Hard to hold umbrellas
7	32-38	Near Gale - White foam from breaking waves blows in streaks with the wind - Whole trees move; Resistance felt walking into wind
8	39-46	Gale - Waves high and moderately long; Crests break into spin drift, blowing foam in well-marked streaks - Twigs and small branches break off trees; Difficult to walk
9	47-54	Strong Gale - High waves with wave crests that tumble; Dense streaks of foam in wind; Poor visibility from spray - Slight structural damage
10	55-63	Storm - Very high waves with long, curling crests; Sea surface appears white from blowing foam; Heavy tumbling of sea; Poor visibility - Trees broken or uprooted; Considerable structural damage
11	64-73	Violent Storm - Waves high enough to hide small and medium sized ships; Sea covered with patches of white foam; Edges of wave crests blown into froth; Poor visibility - Seldom experienced inland; Considerable structural damage
12	>74	Hurricane - Sea white with spray. Foam and spray render visibility almost non-existent - Widespread damage. Very rarely experienced on land.

Santa Ana Winds and Tornado-Like Wind Activity

Based on local history, most incidents of high wind in the City of Signal Hill are the result of the Santa Ana and El Niño related wind conditions. While high impact wind incidents are not frequent in the area, significant wind events and sporadic tornado activity have been known to negatively impact the City. In addition, the City is increasingly concerned with "global warming" ramifications and potential increases in wind related events.

What are Santa Ana Winds?

"Santa Ana winds are generally defined as warm, dry winds that blow from the east or northeast (offshore). These winds occur below the passes and canyons of the coastal ranges of Southern California and in the Los Angeles and Orange County basins. Santa Ana winds often blow with exceptional speed in the Santa Ana Canyon (the canyon from which it derives its name). Forecasters at the National Weather Service offices in Oxnard and San Diego usually place speed minimums on these winds and reserve the use of "Santa Ana" for winds greater than 25 knots." These winds accelerate to speeds of 35 knots as they move through canyons and passes, with gusts to 50 or even 60 knots.

"The complex topography of Southern California combined with various atmospheric conditions create numerous scenarios that may cause widespread or isolated Santa Ana events. Commonly, Santa Ana winds develop when a region of high pressure builds over the Great Basin (the high plateau east of the Sierra Mountains and west of the Rocky Mountains including most of Nevada and Utah). Clockwise circulation around the center of this high-pressure area forces air downslope from the high plateau. The air warms as it descends toward the California coast at the rate of five degrees F per 1,000 feet due to compressional heating. Thus, compressional heating provides the primary source of warming. The air is dry since it originated in the desert, and it dries out even more as it is heated."

These regional winds typically occur from October to March, and, according to most accounts are named either for the Santa Ana River Valley where they originate, or for the Santa Ana Canyon, southeast of Los Angeles, where they pick up speed.

What are Tornados?

Tornadoes are spawned when there is warm, moist air near the ground, cool air aloft, and winds that speed up and change direction. An obstruction, such as a house, in the path of the wind causes it to change direction. This change increases pressure on parts of the house, and the combination of increased pressures and fluctuating wind speeds creates stresses that frequently cause structural failures.

In order to measure the intensity and wind strength of a tornado, Dr. T. Theodore Fujita developed the Fujita Tornado Damage Scale. This scale compares the estimated wind velocity with the corresponding amount of suspected damage. The scale measures six classifications of tornadoes with increasing magnitude from an "F0" tornado to a "F6+" tornado.

Table: Fujita Tornado Damage Scale
(Source: NOAA Storm Prediction Center)

Scale	Wind Estimated (mph)	Typical Damage
F0	< 73	Light damage. Some damage to chimneys and TV antennas; breaks twigs off trees; pushes over shallow-rooted trees.
F1	73-112	Moderate damage. Peels surface off roofs; windows broken; light trailer houses pushed or overturned; some trees uprooted or snapped; moving automobiles pushed off the road. 74 mph is the beginning of hurricane wind speed.
F2	113-157	Considerable damage. Roofs torn off frame houses leaving strong upright walls; weak buildings in rural areas demolished; trailer houses destroyed; large trees snapped or uprooted; railroad boxcars pushed over; light object missiles generated; cars blown off highway.
F3	158-206	Severe damage. Roofs and some walls torn off frame houses; some rural buildings completely demolished; trains overturned; steel-framed hangar-warehouse-type structures torn; cars lifted off the ground; most trees in a forest uprooted snapped, or leveled.
F4	207-260	Devastating damage. Whole frame houses leveled, leaving piles of debris; steel structures badly damaged; trees debarked by small flying debris; cars and trains thrown some distances or rolled considerable distances; large missiles generated.
F5	261-318	Incredible damage. Whole frame houses tossed off foundations; steel-reinforced concrete structures badly damaged; automobile-sized missiles generated; trees debarked; incredible phenomena can occur.
F6-F12	319 to sonic	Inconceivable damage. Should a tornado with the maximum wind speed in excess of F5 occur, the extent and types of damage may not be conceived. A number of missiles such as iceboxes, water heaters, storage tanks, automobiles, etc. will create serious secondary damage on structures.

Microbursts

Unlike tornados, microbursts are strong, damaging winds which strike the ground and often give the impression a tornado has struck. They frequently occur during intense thunderstorms. The origin of a microburst is downward moving air from a thunderstorm's core. But unlike a tornado, they affect only a rather small area. University of Chicago storm researcher Dr. Ted Fujita first coined the term "downburst" to describe strong, downdraft winds flowing out of a thunderstorm cell that he believed were responsible for the crash of Eastern Airlines Flight 66 in June of 1975.

A downburst is a straight-direction surface wind in excess of 39 mph caused by a small-scale, strong downdraft from the base of convective thundershowers and thunderstorms. In later investigations into the phenomena he defined two sub-categories of downbursts: the larger macrobursts and small microbursts.

Macrobursts are downbursts with winds up to 117 mph which spread across a path greater than 2.5 miles wide at the surface and which last from five to 30 minutes. The microburst, on the other hand is confined to an even smaller area, less than 2.5 miles in diameter from the initial point of downdraft impact. An intense microburst can result in damaging winds near 270 km/hr (170 mph) and often last for less than five minutes.

Downbursts of all sizes descend from the upper regions of severe thunderstorms when the air accelerates downward through either exceptionally strong evaporative cooling or by very heavy rain which drags dry air down with it. When the rapidly descending air strikes the ground, it spreads outward in all directions, like a fast-running faucet stream hitting the sink bottom.

When the microburst wind hits an object on the ground such as a house, garage or tree, it can flatten the buildings, and strip limbs and branches from the tree. After striking the ground, the powerful outward running gust can wreak further havoc along its path. Damage associated with a microburst is often mistaken for the work of a tornado, particularly directly under the microburst. However, damage patterns away from the impact area are characteristic of straight-line winds rather than the twisted pattern of tornado damage."

Tornados, like those that occur every year in the Midwest and Southeast parts of the United States, are a rare phenomenon in most of California, with most tornado-like activity coming from micro-bursts.

What is Susceptible to Windstorms?

Life and Property

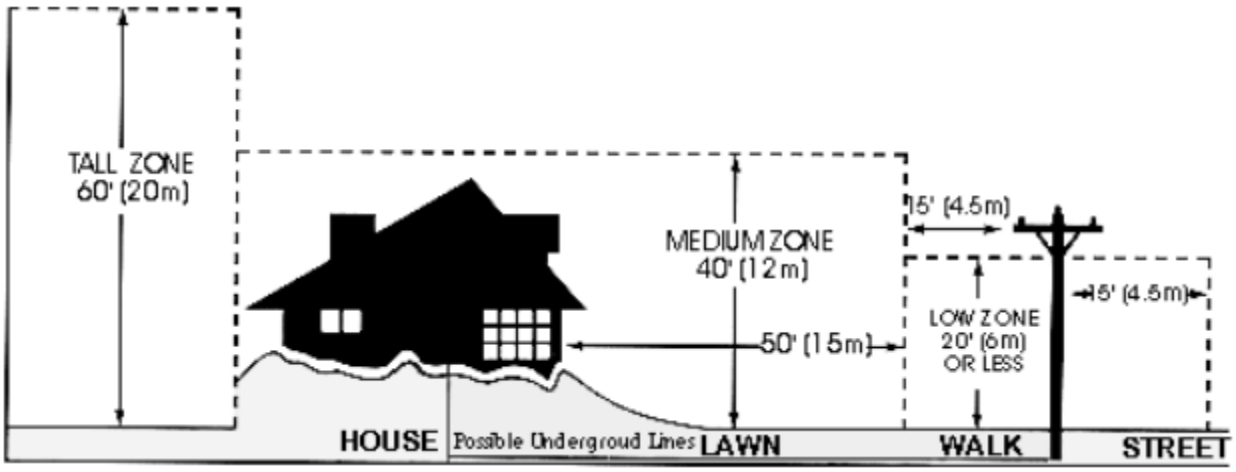
Based on the history of the region, windstorm events can be expected, perhaps annually, across widespread areas of the region which can be adversely impacted during a windstorm event. This can result in the involvement of City emergency response personnel during a wide-ranging windstorm or microburst tornadic activity. Both residential and commercial structures with weak reinforcement are susceptible to damage. Wind pressure creates a direct and frontal

assault on a structure, pushing walls, doors, and windows inward. Conversely, passing currents creates lift suction forces that pull building components and surfaces outward. With extreme wind forces, the roof or entire building can fail causing considerable damage.

Debris carried along by extreme winds can directly contribute to loss of life and indirectly to the failure of protective building envelopes, siding, or walls. When severe windstorms strike a City, downed trees, power lines, and damaged property can be major hindrances to emergency response and disaster recovery.

Utilities

Historically, falling trees are the major cause of power outages in the region. Windstorms such as strong microbursts and Santa Ana Wind conditions cause flying debris and downed utility lines. For example, tree limbs breaking in winds of only 45 mph can be thrown over 75 feet, overhead power lines are damaged, even in relatively minor windstorm events. Falling trees bring electric power lines down to the pavement, creating the possibility of lethal electric shock.



Infrastructure

Windstorms damage buildings, power lines, and other property, and infrastructure, due to falling trees and branches. During wet winters, saturated soils cause trees to become less stable and more vulnerable to uprooting from high winds.

Increased Fire Threat

Perhaps the greatest danger from windstorm activity in Southern California comes from the combination of the Santa Ana winds with the major fires that occur every few years in the urban/wildland interface. With the Santa Ana winds driving the flames, the speed and reach of the flames is even greater than in times of calm wind conditions.

Transportation

Windstorm activity impacts local transportation in addition to the problems caused by downed trees and electrical wires blocking streets and highways. During periods of extremely strong Santa Ana winds, major highways can be temporarily closed to truck and recreational vehicle traffic. However, typically these disruptions are not long lasting, nor do they carry a severe long term economic impact on the region.

Drought Hazards
Hazard Characteristics
Definition

Drought is defined as a deficiency of precipitation over an extended period of time, usually a season or more. This deficiency results in a water shortage for some activity, group, or environmental sector. Drought should be considered relative to some long-term average condition of balance between precipitation and evapotranspiration (i.e., evaporation + transpiration) in a particular area, a condition often perceived as "normal". It is also related to the timing (e.g., principal season of occurrence, delays in the start of the rainy season, occurrence of rains in relation to principal crop growth stages) and the effectiveness of the rains (e.g., rainfall intensity, number of rainfall events). Other climatic factors such as high temperature, high wind, and low relative humidity are often associated with it in many regions of the world and can significantly aggravate its severity. Drought should not be viewed as merely a physical phenomenon or natural event. Its impacts on society result from the interplay between a natural event (less precipitation than expected resulting from natural climatic variability) and the demand people place on water supply. Human beings often exacerbate the impact of drought. Recent droughts in both developing and developed countries and the resulting economic and environmental impacts and personal hardships have underscored the vulnerability of all societies to this "natural" hazard.

One dry year does not normally constitute a drought in California, but serves as a reminder of the need to plan for droughts. California's extensive system of water supply infrastructure - its reservoirs, groundwater basins, and inter-regional conveyance facilities - mitigates the effect of short-term dry periods for most water users. Defining when a drought begins is a function of drought impacts to water users. Hydrologic conditions constituting a drought for water users in one location may not constitute a drought for water users elsewhere, or for water users having a different water supply. Individual water suppliers may use criteria such as rainfall/runoff, amount of water in storage, or expected supply from a water wholesaler to define their water supply conditions.

Many governmental utilities, the National Oceanic and Atmospheric Administration (NOAA), and the California Department of Water Resources, as well as academic institutions such as the University of Nebraska-Lincoln's National Drought Mitigation Center and the National Drought Mitigation Center, generally agree that there is no clear definition of drought. Drought is highly variable depending on location.

Drought Threat

The region’s Mediterranean climate makes it especially susceptible to variations in rainfall. Severe water shortages could have a bearing on the economic well-being of the community. Comparison of climate (rainfall) records from Los Angeles with water well records beginning in 1930 from the San Gabriel Valley indicates the existence of wet and dry cycles on a 10-year scale as well as for much longer periods. The climate record for the Los Angeles region beginning in 1890 suggests drying conditions over the last century. With respect to the present day, climate data also suggests that the last significant wet period was the 1940s. Well level data and other sources seem to indicate the historic high groundwater levels (reflecting recharge from rainfall) occurred in the same decade. Since that time, rainfall (and groundwater level trends) appears to be in decline. This slight declining trend, however, is not believed to be significant. Climatologists compiled rainfall data from 96 stations in the State that spanned a

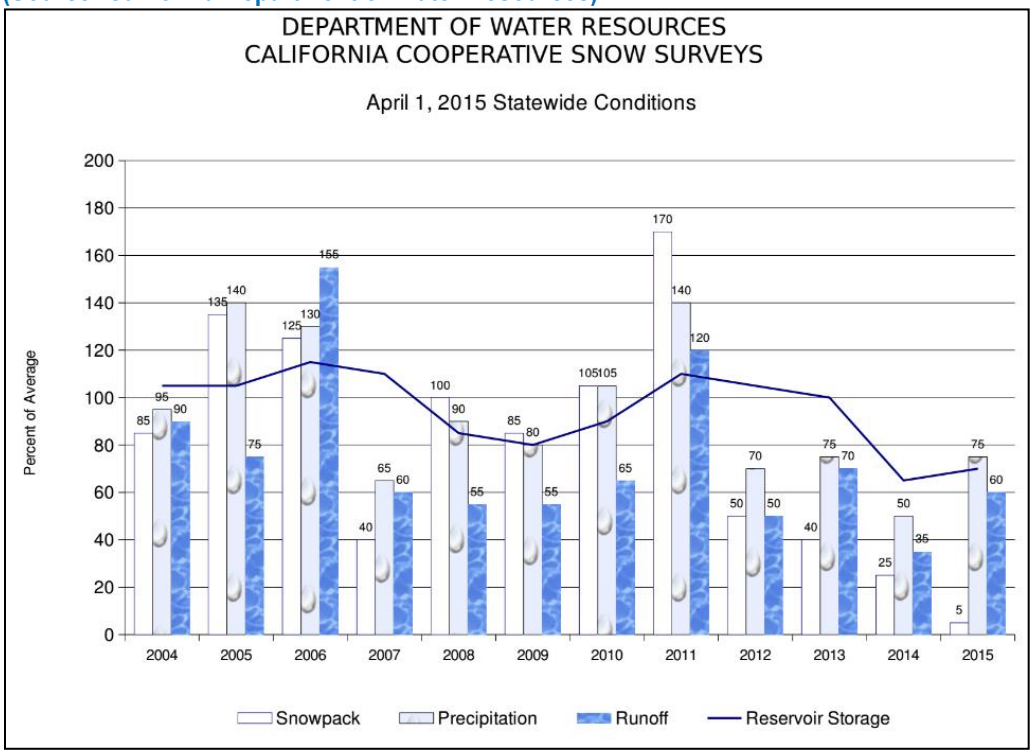
100-year period between 1890 and 1990. An interesting note is that during the first 50 years of the reporting period, there was only one year (1890) that had more than 35 inches of rainfall, whereas the second 50-year period recording of 5 year intervals (1941, 1958, 1978, 1982, and 1983) that exceeded 35 inches of rainfall in a single year. The year of maximum rainfall was 1890 when the average annual rainfall was 43.11 inches. The second wettest year on record occurred in 1983 when the State's average was 42.75 inches.

The driest year of the 100-year reported in the study was 1924 when the State's average rainfall was only 10.50 inches. The region with the most stations reporting the driest year in 1924 was the San Francisco Bay area. The second driest year was 1977 when the average was 11.57 inches. The most recent major drought (1987 to 1990) occurred at the end of a sequence of very wet years (1978 to 1983). The debate continues whether "global warming" is occurring, and the degree to which global climate change will have an effect on local micro-climates. The semi-arid southwest is particularly susceptible to variations in rainfall. A study that documented annual precipitation for California since 1600 from reconstructed tree ring data indicates that there was a prolonged dry spell from about 1755 to 1820 in California. Fluctuations in precipitation could contribute indirectly to a number of hazards including wildfire and the availability of water supplies.

General Situation

Figure: Water Supply Conditions below illustrates several indicators commonly used to evaluate California water conditions. The percent of average values are determined for measurement sites and reservoirs in each of the State's ten major hydrologic regions. Snow pack is an important indicator of runoff from Sierra Nevada watersheds, the source of much of California's developed water supply.

Figure: Water Supply Conditions
(Source: California Department of Water Resources)



Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multiyear period. There is no universal definition of when a drought begins or ends.

Types of Drought

There are four different ways that drought can be defined:
(1) Meteorological - a measure of departure of precipitation from normal. Due to climatic differences what is considered a drought in one location may not be a drought in another location.
(2) Agricultural - refers to a situation when the amount of moisture in the soil no longer meets the needs of a particular crop.
(3) Hydrological - occurs when surface and subsurface water supplies are below normal.
(4) Socioeconomic - refers to the situation that occurs when physical water shortage begins to affect people.

Historical California Droughts

A significant drought, reported by many of the ranchers in southern California, occurred in 1860. The great drought of the 1930s, coined the "Dust Bowl," was geographically centered in the Great Plains yet ultimately affected water shortages in California. The drought conditions in the plains resulted in a large influx of people to the west coast. Approximately 350,000 people from Arkansas and Oklahoma immigrated mainly to the Great Valley of California. As more people moved into California, including Los Angeles County increases in intensive agriculture led to overuse of the Santa Ana River watershed and groundwater resulting in regional water shortages. Several bills have been introduced into Congress in an effort to mitigate the effects of drought. In 1998, President Clinton signed into law the National Drought Policy Act, which called for the development of a national drought policy or framework that integrates actions and responsibilities among all levels of government. In addition, it established the National Drought Policy Commission to provide advice and recommendations on the creation of an integrated federal policy. The most recent bill introduced into Congress was the National Drought Preparedness Act of 2003, which established a comprehensive national drought policy and statutorily authorized a lead federal utility for drought assistance. Currently there exists only an ad-hoc response approach to drought unlike other disasters (e.g., hurricanes, floods, and tornadoes) which are under the purview of FEMA.

Droughts exceeding three years are relatively rare in Northern California, the source of much of the State's developed water supply. The 1929-34 droughts established the criteria commonly used in designing storage capacity and yield of large Northern California reservoirs. The driest single year of California's measured hydrologic record was 1977. According to USGS, California's most recent multi-year droughts occurred between 1987-92, 2006-2010 and 2012-2016.

The Long-term Climatic Viewpoint

The historical record of California hydrology is brief in comparison to geologically modern climatic conditions. The following sampling of changes in climatic conditions over time helps put California's twentieth century droughts into perspective. Most of the dates shown below are necessarily approximations.

Not only must the climatic conditions be inferred from indirect evidence, but the onset or extent of changed conditions may vary with geographic location. Readers interested in the subject of paleo-climatology are encouraged to seek out the extensive body of popular and scientific literature on this subject.

Past California Droughts

The historical record of California hydrology is brief in comparison to the time period of geologically modern climatic conditions. The following samplings of changes in climatic and hydrologic conditions help put California's twentieth century droughts into perspective, by illustrating the variability of possible conditions. Most of the dates shown below are approximations, since the dates must be inferred from indirect sources.

11,000 years before present

Beginning of Holocene Epoch- Recent time, the time since the end of the last major glacial epoch.

6,000 years before present

Approximate time when trees were growing in areas now submerged by Lake Tahoe. Lake levels were lower then, suggesting a drier climate.

900-1300 A.D. (Approximate)

The Medieval Warm Period, a time of warmer global average temperatures. The Arctic ice pack receded, allowing Norse settlement of Greenland and Iceland. The Anasazi civilization in the Southwest flourished, its irrigation systems supported by monsoonal rains.

1300-1800 A.D. (approximate)

The Little Ice Age, a time of colder average temperatures. Norse colonies in Greenland failed near the start of the time period, as conditions became too cold to support agriculture and livestock grazing. The Anasazi culture began to decline about 1300 and had vanished by 1600, attributed in part to drought conditions that made agriculture infeasible.

Mid - 1500s A.D.

Severe, sustained drought throughout much of the continental U.S., according to dendrochronology. Drought suggested as a contributing factor in the failure of European colonies at Parris Island, South Carolina and Roanoke Island, North Carolina.

1850s A.D.

Sporadic measurements of California precipitation began.

1890s A.D.

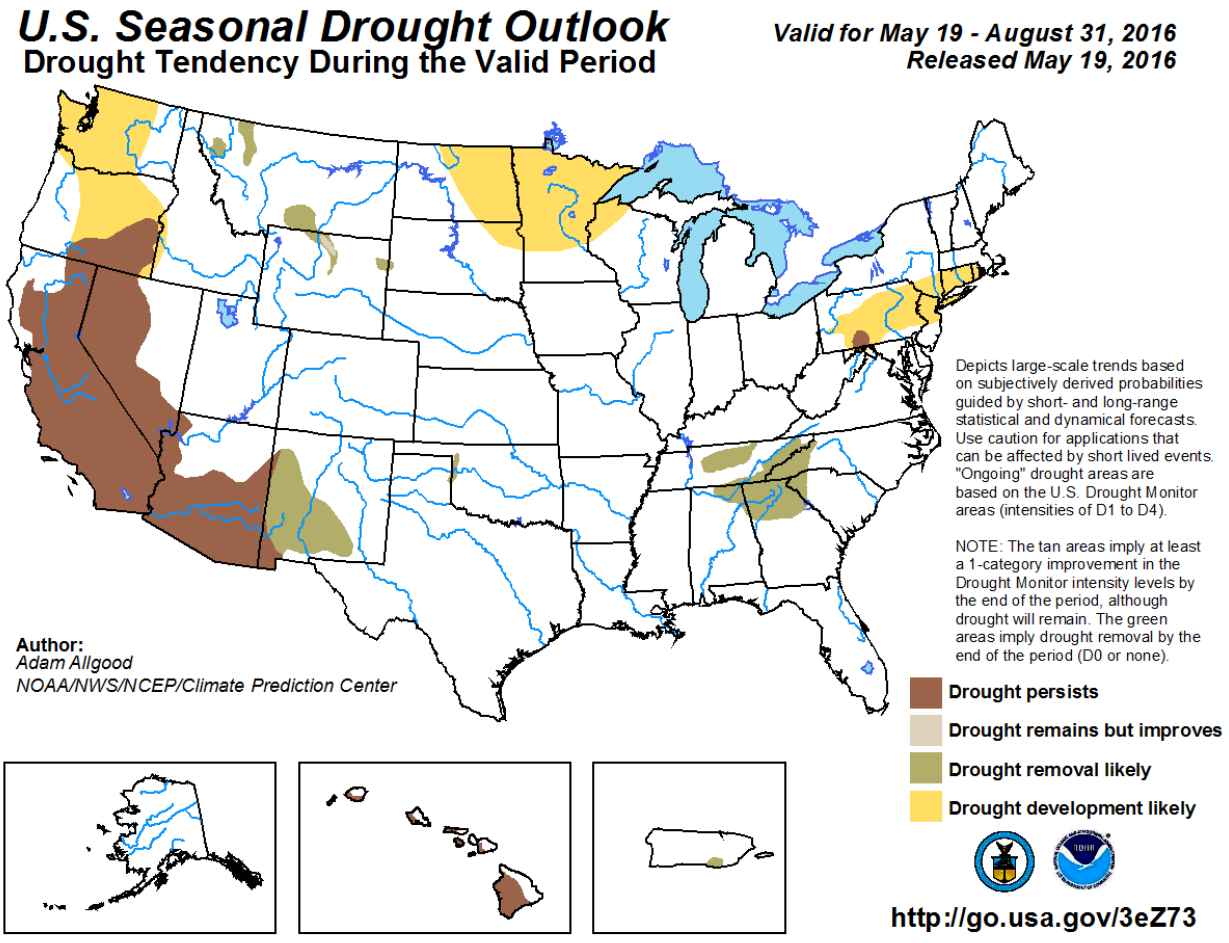
Long-term stream flow measurements began at a few California locations.

Palmer Drought Severity Index

Of the many varied indexes used to measure drought, the "Palmer Drought Severity Index" (PDSI) is the most commonly used drought index in the United States. Developed by meteorologist Wayne Palmer, the PDSI is used to measure dryness based on recent temperature compared to the amount of precipitation. It utilizes a number range, 0 as normal, drought shown in terms of minus numbers, and wetness shown in positive numbers. The PDSI is most effective at analyzing long-range drought forecasts or predications. Thus, the PDSI is very effective at evaluation trends in the severity and frequency of prolonged periods of drought, and conversely wet weather. The National Oceanic and Atmospheric Administration (NOAA) publish weekly Palmer maps, which are also used by other scientists to analyze the long-term trends associated with global warming and how this has affected drought conditions.

The following map is the most current snapshot of drought conditions across the U.S. It is provided by NOAA's Climate Prediction Center.

Map: U.S. Seasonal Drought Outlook
(Source: NOAA Climate Prediction Center)



Attachments

FEMA Letter of Approval

U.S. Department of Homeland Security
1111 Broadway, Suite 1200
Oakland, CA. 94607-4052

FEMA

January 8, 2018

Richard Johnson
Emergency Operations Coordinator
City of Signal Hill
2745 Walnut Avenue
Signal Hill, CA 90755

Dear Mr. Johnson:

We have completed our final review of the *City of Signal Hill 2017 Hazard Mitigation Plan*, officially adopted by the City of Signal Hill on October 10, 2017, and found the plan to be in conformance with Title 44 Code of Federal Regulations (CFR) Part 201.6 *Local Mitigation Plans*.

The approval of this plan ensures the City of Signal Hill's continued eligibility for project grants under FEMA's Hazard Mitigation Assistance programs, including the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program. All requests for funding, however, will be evaluated individually according to the specific eligibility, and other requirements of the particular program under which applications are submitted.

Also, approved hazard mitigation plans may be eligible for points under the National Flood Insurance Program's Community Rating System (CRS). Additional information regarding the CRS can be found at https://www.fema.gov/national-flood-insurance-program-community-rating-system or through your local floodplain manager.

FEMA's approval of the *City of Signal Hill 2017 Hazard Mitigation Plan* is for a period of five years, effective starting the date of this letter. Prior to January 8, 2023, City of Signal Hill is required to review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval in order to continue to be eligible for mitigation project grant funding. The enclosed plan review tool provides additional recommendations to incorporate into the plan when City of Signal Hill undertakes its identified plan maintenance process.

If you have any questions regarding the planning or review processes, please contact Alison Kearns, Senior Community Planner, at (510) 627-7125 or by email at alison.kearns@fema.dhs.gov.

Sincerely,

Jeffrey D. Lusk
Division Director
Mitigation Division
FEMA Region IX

Enclosure

cc: Julie Norris, Mitigation and Dam Safety Branch Chief, California Governor's Office of Emergency Services
Jennifer Hogan, State Hazard Mitigation Officer, California Governor's Office of Emergency Services

www.fema.gov

FEMA Review Tool

REGION IX LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers states and FEMA mitigation planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA's evaluation of whether the plan has addressed all requirements.
- The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement. This section also includes a list of resources for implementation of the plan.

Jurisdiction: City of Signal Hill	**Title of Plan:** 2017 Hazard Mitigation Plan	**Date of Plan:** July 26, 2017
Local Point of Contact: Richard Johnson **Title:** Emergency Operations Coordinator **Agency:** City of Signal Hill	**Address:** 2745 Walnut Avenue Signal Hill, CA 90755	
Phone Number: 562-985-7239	**E-Mail:** rjohnson@signalhillpd.org	

State Reviewer: Lori Newquist	**Title:** Emergency Services Coordinator	**Date:** March 21, 2017
Date Received at State Agency		
Plan Not Approved		
Plan Approved/Sent to FEMA		

FEMA Reviewer:	**Title:**	**Date:**
Emma Reed	Hazard Mitigation Planner	April 12, 2017
Lindsey Robinson	Hazard Mitigation Planner	April 16, 2017
Lindsey Robinson	Hazard Mitigation Planner	August 27, 2017
Date Received in FEMA Region IX	First Submission: March 28, 2017 Second Submission: July 27, 2017	
Plan Not Approved		
Plan Approvable Pending Adoption	September 7, 2017	
Plan Approved	January 8, 2018	

SECTION 1:
REGULATION CHECKLIST

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)		Location in Plan (section and/or page number)	Met	Not Met
ELEMENT A. PLANNING PROCESS				
A1. Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Does the plan document the planning process, including how it was prepared (with a narrative description, meeting minutes, sign-in sheets, or another method)?	Part I-Planning Process, pp. 17-24	X	
	Does the plan list the jurisdiction(s) participating in the plan that are seeking approval?	Part I-Planning Process, pp. 17-24	X	
	Does the plan identify who represented each jurisdiction? (At a minimum, it must identify the jurisdiction represented and the person's position or title and agency within the jurisdiction.)	Credits, p. 2; Part I-Planning Process, pp. 17-24	X	
A2. Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Does the plan document an opportunity for neighboring communities, local, and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development, as well as other interested parties to be involved in the planning process?	Part I-Planning Process, pp. 17-18	X	
	Does the plan identify how the stakeholders were invited to participate in the process?	Part I-Planning Process, pp. 22-24	X	
A3. Does the plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))		Part I-Planning Process, p. 21	X	
A4. Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))		Part I-Use of Existing Data, p. 26 and sources listed throughout plan; Table: Capability Assessment, p. 25	X	
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))		Part III-Plan Maintenance, p. 133	X	

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)		Location in Plan (section and/or page number)	Met	Not Met
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Does the plan identify how, when, and by whom the plan will be **monitored** (how will implementation be tracked) over time?	Part III-Plan Maintenance, pp. 131-153	X	
	Does the plan identify how, when, and by whom the plan will be **evaluated** (assessing the effectiveness of the plan at achieving stated purpose and goals) over time?	Part III-Plan Maintenance, p. 153	X	
	Does the plan identify how, when, and by whom the plan will be **updated** during the 5-year cycle?	Part III-Plan Maintenance, pp. 131-132	X	
ELEMENT A: REQUIRED REVISIONS				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT (Reviewer: See Section 4 for assistance with Element B)				
B1. Does the plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Does the plan include a general **description** of all natural hazards that can affect each jurisdiction?	Part II-Earthquake: pp. 45-46 Landslide: p. 87 Windstorm: p. 90 Drought: pp. 92-93; Part IV-General Hazard Overviews, pp. 134-152	X	
	Does the plan provide rationale for the omission of any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area?	Part II-Hazard Identification, pp. 36-37	X	
	Does the plan include a description of the **location** for all natural hazards that can affect each jurisdiction?	Part II-Earthquake: pp. 45-49 Landslide: pp. 87-88 Windstorm: p. 90 Drought: pp. 92-93 p. 40	X	

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)		Location in Plan (section and/or page number)	Met	Not Met
	Does the plan include a description of the **extent** for all natural hazards that can affect each jurisdiction?	Part II- Earthquake: pp. 45-54 Landslide: pp. 87-89 Windstorm: p. 91 Drought: pp. 92-93 Part IV: pp. 134-152	X	
B2. Does the plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Does the plan include information on **previous occurrences** of hazard events for each jurisdiction?	Part II- Earthquake: p. 45 Landslide: p. 87 Windstorm: p. 90 Drought: p. 92 Part IV: pp. 134-152	X	
	Does the plan include information on the **probability** of future hazard events for each jurisdiction?	Part II-Table: Calculated Priority Risk Index Ranking, p. 39 Table: Vulnerability: Location, Extent, and Probability for City of Signal Hill, p. 40	X	
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Is there a description of each hazard's **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)?	Part II- Earthquake: pp. 50-51 Landslide: p. 89 Windstorm: p. 91 Drought: p. 93	X	
	Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction?	Part II- Table: Vulnerability: Location, Extent, and Probability for City of Signal Hill: p. 40, Table: Critical Facilities Vulnerable to Hazards: p.41, Table: Impacts to Existing and Future Land Uses in the City of Signal Hill: pp.44-45	X	

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)		Location in Plan (section and/or page number)	Met	Not Met
B4. Does the plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))		Part I-Repetitive Loss Properties, p. 11	X	
ELEMENT B: REQUIRED REVISIONS				
ELEMENT C. MITIGATION STRATEGY				
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Does the plan document each jurisdiction's existing authorities, policies, programs and resources?	Part I- Capability Assessment, pp. 24-25	X	
	Does the plan document each jurisdiction's ability to expand on and improve these existing policies and programs?	Part I- Capability Assessment, pp. 24-25	X	
C2. Does the plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))		Part I-National Flood Insurance Program, p. 9	X	
C3. Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))		Part III-Goals, pp. 95-96	X	
C4. Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Does the plan identify and analyze a comprehensive range (different alternatives) of specific mitigation actions and projects to reduce the impacts from hazards?	Part III-Mitigations Action Matrix, pp. 101-127	X	
	Does the plan identify mitigation actions for every hazard posing a threat to each participating jurisdiction?	Part III-Mitigations Action Matrix, pp. 101-127	X	
	Do the identified mitigation actions and projects have an emphasis on new and existing buildings and infrastructure?	Part III-Mitigations Action Matrix, pp. 101-127	X	
C5. Does the plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement	Does the plan explain how the mitigation actions and projects will be prioritized (including cost benefit review)?	Part III-Benefit/Cost Ratings, p. 98; Priority Rating, p. 99	X	

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)		Location in Plan (section and/or page number)	Met	Not Met
§201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Does the plan identify the position, office, department, or agency responsible for implementing and administering the action/project, potential funding sources and expected timeframes for completion?	Part III-Mitigations Action Matrix, pp. 101-127	X	
C6. Does the plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Does the plan identify the local planning mechanisms where hazard mitigation information and/or actions may be incorporated?	Part III-Implementation Through Existing Programs, p. 129	X	
	Does the plan describe each community's process to integrate the data, information, and hazard mitigation goals and actions into other planning mechanisms?	Part III-Implementation Through Existing Programs, p. 129	X	
	The updated plan must explain how the jurisdiction(s) incorporated the mitigation plan, when appropriate, into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts.	Part III-Implementation Through Existing Programs, pp. 131-132	X	
ELEMENT C: REQUIRED REVISIONS				
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (Applicable to plan updates only)				
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))		Part II-Changes in Development, pp. 43-44	X	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))		Part III-Mitigation Action Matrix, pp. 101-127	X	
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))		Part III-Mitigation Action Matrix, pp. 101-127	X	
ELEMENT D: REQUIRED REVISIONS				

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT E. PLAN ADOPTION			
E1. Does the plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Part I-Planning Phases Timeline, pp. 17-18	X	
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	N/A		
ELEMENT E: REQUIRED REVISIONS			
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (Optional for State Reviewers only; not to be completed by FEMA)			
F1.			
F2.			
ELEMENT F: REQUIRED REVISIONS			

SECTION 2:
PLAN ASSESSMENT

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

Strengths:

1) The plan includes a good amount of supporting documentation of planning processes (i.e., sign-in sheets from various Planning Team meetings and public workshops) as well as public and stakeholder outreach activities.
2) It is clear that the City made an effort to include as many stakeholders and members of the public as they could reach throughout the plan development process.
3) The Planning Team includes a variety of stakeholders from relevant City departments and agencies/organizations involved with mitigation activities in the region.
4) The chart showing the chronological stages of the plan development process served as an effective visual for this process.
5) The plan includes good templates and schedules for future plan maintenance activities and processes (i.e., five-year updates).

Opportunities for Improvement:

1) For the next plan update, it may be useful to consider gaining increased participation from the local media to help increase public awareness and participation in planning processes.
2) The plan could include a more thorough review of existing studies and best available data used in the plan.
3) The plan includes attachments related to the Planning Process, these should be referenced in the main body of the plan.
4) The last column in the quarterly implementation report table is for "comments and status." It is suggested to include prompts to help identify the types of information that would be helpful in monitoring the actions such as: date completed; if not on time, what were the delays; final project cost; overrun or underrun. Users could also be prompted to update the already completed columns s needed (i.e. updated timeline, coordinating agency, and funding source as appropriate).
5) The BCA image is not with the BCA section (p. 133).

Element B: Hazard Identification and Risk Assessment

Strengths:

1) The plan provides a detailed discussion/explanation of how the hazards were identified and selected for inclusion in the Hazard Mitigation Plan.
2) A comprehensive background on the history and general description of the hazards (incl. the Appendix) helps set the stage for the Risk Assessment section.
3) The plan includes detailed tables, maps, and figures to enhance the hazard profiles to enable plan readers to better understand the hazards as well as their history and potential impacts.
4) The plan does a nice job of incorporating a good amount of quantitative impacts of hazards on the community.

Opportunities for Improvement:

1) Vulnerabilities to structures could be expanded to include potential dollar losses.
2) Maps indicating locations of facilities relative to one another and various hazards also would be beneficial.
3) In terms of the rationale for the omission of any natural hazards, the plan says that Calculated priority risk index helped to conclude that the 4 hazards posed a significant threat. It would be helpful to see what the ranking is for those hazards chosen to be in the plan vs those hazards that were omitted.
4) The table "Vulnerability: Location, Extent, and Probability for City of Signal Hill" should be referenced in the main body of the plan.
5) A description of the extent of the hazards is included in the Part IV – General Characteristics section of the plan. This should be moved to the main body of the plan or at a minimum, referenced in the main body of the plan.

Element C: Mitigation Strategy

Strengths:

1) A few of the mitigation actions contain emergency response elements that can be further enforced by outreach/participation from local police, fire, and/or EMS services in the jurisdiction (i.e., CPR, first aid training and disaster planning).
2) The Mitigation Actions Matrix was laid out in a helpful format that effectively condensed, summarized, and conveyed the information necessary for the Mitigation Strategy.

Opportunities for Improvement:

1) Consider adding additional discussion of available staff, technical resources and capabilities, funding resources, and risk management capabilities, including a more detailed description of how the City could expand those capabilities.

2) Future plan updates could include additional or more detailed potential implementation steps and processes for prioritized mitigation actions in the Mitigation Strategy section of the plan.
3) The last paragraph on p 131 references the 2005 plan, is this supposed to be the 2012 plan? There are no other references to a 2005 plan (and no records of one in the FEMA database)
4) The last paragraph on p 131 notes that some of the previous actions were implemented, "but not as a deliberate act to implement the Mitigation Plan." Even if implementation was not intentional, what actions and how they were implemented should be included in the plan.
5) The plan includes a number of mitigation actions, but many of them are revised actions from the previous plan and response actions. It is suggested to include more new actions in each version of the plan and more actions that are mitigation rather than response actions.

Element D: Plan Update, Evaluation, and Implementation (*Plan Updates Only*)

Strengths:

1) The plan includes a good discussion of the processes undertaken to update the previous version of the Hazard Mitigation Plan document and provides a thorough description of changes that have been made since the prior version of the plan document in 2012.
2) The plan indicates changes (and reasoning) of mitigation actions recommended in the previous version of the Hazard Mitigation Plan, which helps to build a foundation for the current mitigation strategy.

Opportunities for Improvement:

1) The plan should include more detailed descriptions of the progress made on mitigation actions in the years since the previous version of the Hazard Mitigation Plan as well as changes in priorities and reasons for these changes, if applicable.
2) The plan also could discuss barriers or obstacles to the successful implementation or completion of mitigation actions, as well as provide possible solutions for overcoming these and associated risks.

B. Resources for Implementing and Updating Your Approved Plan

This resource section is organized into three categories:

1) Guidance and Resources
2) Training Topics and Courses
3) Funding Sources

Guidance and Resources

Local Mitigation Planning Handbook
https://www.fema.gov/media-library/assets/documents/31598

Beyond the Basics
http://mitigationguide.org/

Mitigation Ideas
https://www.fema.gov/media-library/assets/documents/30627

Plan Integration: Linking Local Planning Efforts
https://www.fema.gov/media-library/assets/documents/108893

Integrating Disaster Data into Hazard Mitigation Planning
https://www.fema.gov/media-library/assets/documents/103486

Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning
https://www.fema.gov/ar/media-library/assets/documents/4317

Community Rating System User Manual
https://www.fema.gov/media-library/assets/documents/8768

U.S. Climate Resilient Toolkit
https://toolkit.climate.gov/

2014 National Climate Assessment
http://nca2014.globalchange.gov/

Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation
http://ipcc-wg2.gov/SREX/images/uploads/SREX-All_FINAL.pdf

FY15 Hazard Mitigation Assistance Unified Guidance
https://www.fema.gov/media-library/assets/documents/103279

Climate Resilient Mitigation Activities for Hazard Mitigation Assistance
https://www.fema.gov/media-library/assets/documents/110202

Training

More information at https://training.fema.gov/emi.aspx or through your State Training Officer

Mitigation Planning

IS-318 Mitigation Planning for Local and Tribal Communities
https://training.fema.gov/is/courseoverview.aspx?code=is-318

IS-393 Introduction to Hazard Mitigation
https://training.fema.gov/is/courseoverview.aspx?code=is-393.a

G-318 Preparing and Reviewing Local Plans

G-393 Mitigation for Emergency Managers

Hazard Mitigation Assistance (HMA) Grant Programs

IS-212.b Introduction to Unified HMA
http://www.training.fema.gov/is/courseoverview.aspx?code=IS-212.b
IS-277 Benefit Cost Analysis Entry Level
http://www.training.fema.gov/is/courseoverview.aspx?code=IS-277
E-212 HMA: Developing Quality Application Elements
E-213 HMA: Application Review and Evaluation
E-214 HMA: Project Implementation and Programmatic Closeout
E-276 Benefit-Cost Analysis Entry Level

GIS and Hazus-MH

IS-922 Application of GIS for Emergency Management
http://www.training.fema.gov/is/courseoverview.aspx?code=IS-922
E-190 ArcGIS for Emergency Managers
E-296 Application of Hazus-MH for Risk Assessment
E-313 Basic Hazus-MH

Floodplain Management

E-273 Managing Floodplain Development through the NFIP
E-278 National Flood Insurance Program/ Community Rating System

Potential Funding Sources

Hazard Mitigation Grant Program
POC: FEMA Region IX and State Hazard Mitigation Officer
Website: https://www.fema.gov/hazard-mitigation-grant-program

Pre-Disaster Mitigation Grant Program
POC: FEMA Region IX and State Hazard Mitigation Officer
Website: https://www.fema.gov/pre-disaster-mitigation-grant-program

Flood Mitigation Assistance Grant Program
POC: FEMA Region IX and State Hazard Mitigation Officer
Website: https://www.fema.gov/flood-mitigation-assistance-grant-program

Emergency Management Performance Grant Program
POC: FEMA Region IX
Website: https://www.fema.gov/emergency-management-performance-grant-program

City Council Staff Report
STAFF REPORT

TO: Honorable Mayor and Members of the City Council

FROM:

DATE:

SUBJECT: **APPROVAL OF THE HAZARD MITIGATION PLAN**

RECOMMENDATION

Staff recommends that the City Council approve a Resolution adopting the City of Signal Hill Hazard Mitigation Plan ("Plan"). Adoption legitimizes the plan and authorizes departments and their staffs to execute their responsibilities.

BACKGROUND

The federal Disaster Management Act of 2000 (DMA 2000), which amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act, requires every local, county and state government to have an approved Hazard Mitigation Plan. In addition to minimizing the impact of major hazard events on the community, completion of the Plan also maintains eligibility for future hazard mitigation funding following any significant disasters. As a result of the DMA 2000 legislation, hazard mitigation is now considered to be the first step in preparing for emergencies, rather than the final step in recovery.

The consequences of not having an approved Hazard Mitigation Plan are significant. Without one, the City will be ineligible for FEMA mitigation programs including the Hazard Mitigation Grant Program, Flood Mitigation Assistance Program, and most importantly, potential loss of public assistance for repetitively damaged facilities following a disaster. As an example, the County of Los Angeles received approximately $500 million in FEMA mitigation money following the 1994 Northridge Earthquake.

Emergency Planning Consultants was contracted to assist the City in drafting the Plan. A Planning Team was formed consisting of representatives from Administration, Police, Public Works, Community Services, Finance, and Community Development Department. The Team met three times over a period of approximately one year to examine hazards and impacts, develop mitigation actions, develop a strategy for public input, and review the First Draft Plan.

Much of the information required for the Hazard Mitigation Plan already existed in City documents including the City's 2012 Mitigation Plan. The City's General Plan and Emergency Operations Plan also contained valuable data and information required to prepare the Mitigation Plan.

As mentioned above, it was important to provide an opportunity for the general public as well as interested external agencies (e.g. adjoining jurisdictions, special districts, etc.) to participate in the planning process. This was accomplished through posting of the Second Draft Plan and distribution of invitations via the City's website and direct emails.

Tonight's meeting is another critical component of the planning process as another opportunity for participation by the public in an open public meeting. Tonight's meeting was announced on the City's website and other routine postings. Review copies of the Plan were available at the Police Department and City Clerk's Office.

PLAN STRUCTURE

The Hazard Mitigation Plan documents the mitigation planning process including how it was developed, the planning timeframe, and who was involved in drafting the document. A risk assessment was conducted and details the type of natural hazards that can affect the jurisdiction. The Plan also includes information on previous occurrences of hazard events and the probability of future events. The City's essential and critical facilities were assessed as to vulnerability. Demographic and land use data is also important in identifying present day and future vulnerabilities.

Updating the mitigation strategy from the 2012 Plan was the next step. The Mitigation Strategy outlines the City's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools.

FINDINGS

The Plan identifies a broad range of mitigation action items, including assigned departments, timelines, and priorities. The mitigation action items are aimed at activities that will minimize or eliminate the impact of hazards on the community and its vital resources.

PLAN ADOPTION AND APPROVAL

The City Council is requested to adopt the Third Draft Plan. The Plan has already been reviewed by Cal OES without any requested amendments and minor revisions were made to satisfy requests from FEMA Region IX. Proof of the Council's adoption will be forwarded to FEMA along with a request for a final approval.

RECOMMENDATIONS

Staff recommends that City Council approves Resolution _____ which adopts the 2017 Hazard Mitigation Plan.

City Council Resolution

RESOLUTION NO. 2017-10-6233

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SIGNAL HILL, CALIFORNIA, ADOPTING THE 2017 HAZARD MITIGATION PLAN

WHEREAS, in 2000, the Federal Disaster Mitigation Act of 2000 was passed requiring state and local governments to prepare mitigation plans to document their mitigation planning process, and identify hazards, potential losses, mitigation needs, goals and strategies; and

WHEREAS, on January 1, 2007, California Assembly Bill 2140 was passed which places limits on the amount of additional state funding to local jurisdictions for certain disaster recovery projects funded by the California Disaster Assistance Act, unless a local jurisdiction has a state and federally approved local Hazard Mitigation Plan and has incorporated the Hazard Mitigation Plan into the jurisdiction's Safety Element; and

WHEREAS the City Council recognizes the threat that natural hazards pose to people and property within the City of Signal Hill; and

WHEREAS the City of Signal Hill has prepared a multi-hazard mitigation plan, hereby known as the 2017 Hazard Mitigation Plan in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the 2017 Hazard Mitigation Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Signal Hill from the impacts of future hazards and disasters; and

WHEREAS adoption by the City Council demonstrates their commitment to the hazard mitigation and achieving the goals outlined in 2017 Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED, that the City Council of the City of Signal Hill, California, does hereby approve the 2017 Hazard Mitigation Plan (Attachment A).

PASSED, APPROVED, AND ADOPTED, at a regular meeting of the City Council of the City of Signal Hill, California, on this 10th day of October, 2017.

EDWARD H.J. WILSON
MAYOR

ATTEST:

KEIR JONES
CITY CLERK

STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES) ss.
CITY OF SIGNAL HILL)

I, KEIR JONES, City Clerk of the City of Signal Hill, California, hereby certify that Resolution No. 2017-10-6233 was adopted at a regular meeting of the City Council held on the 10th day of October 2017 by the following vote:

AYES: MAYOR EDWARD H.J. WILSON, COUNCIL MEMBERS LARRY FORESTER, ROBERT D. COPELAND, LORI Y. WOODS

NOES: NONE

ABSENT: VICE MAYOR TINA L. HANSEN

ABSTAIN: NONE

KEIR JONES
CITY CLERK

Planning Team Sign-In Sheets

City of Signal Hill
Hazard Mitigation Planning Team Meeting #1
August 10, 2016

Name	Department
CAROLYN HARSHMAN	EMERGENCY PLANNING CONSULTANTS
MICHAEL LANGSTON	SIGNAL HILL P.D.
RICHARD JOHNSON	SIGNAL HILL P.D.
CHARLIE HONEYCUTT	ADMINISTRATION
ALY MANCINI	COMMUNITY SERVICES depart
SCOTT CHARNEY	COMMUNITY DEVELOPMENT
TERRI MARSH	FINANCE
TRAVIS BROOKS	PW

Signal Hill Hazard Mitigation Planning Meeting #2 08-31-2016

Name	Postion	
ALY MANCINI	DIR OF COMMUNITY SVCS	
Selena Adams	Associate Planner	SA
SCOTT CHARNEY	DIR. OF COMM DEV	
MEKE LANGSTON	CHIEF OF POLICE	
CHARLIE HONEYCUTT	CITY MANAGER	
RICHARD JOHNSON	EMER. OPS. COORD.	
TERRI MARSH	Dir of FINANCE	
STEVE MYRTER	Dir of PW	

Web Postings and Notices

IT archive of landing page of City's website from 11/9-28/2016

Last modified by Sylvia Soong on 11/9/2016 4:09:04 PM

Start Date:	11/09/2016
End Date:	11/28/2016
Title:	Updated Hazard Mitigation Plan
Brief Description:	The City of Signal Hill has prepared an update draft to the existing Hazard Mitigation Plan.
Link Text:	Read on...
Complete Text:	The state and federal requirements for plan adoption are for the City to invite public comment and input to the plan. If you wish to view the 2016 Hazard Mitigation Plan draft and make comments regarding any element in the plan, please click on the following link to view the document. If you wish to view the 2016 Hazard Mitigation Plan draft please click on the link below to view the document. If you wish to submit comments regarding any element in the plan please address your letter to Richard Johnson, Emergency Operations Coordinator, Signal Hill Police Department, 2745 Walnut Avenue, Signal Hill, CA 90755 or by email to rjohnson@signalhillpd.org. Alternately, you may view a hard copy of the plan by visiting Signal Hill City Hall. All comments must be received not later than close of business on Nov. 28, 2016.
Image:	
Image Alt Text:	
Image Alignment:	right
Alternate Link:	http://www.cityofsignalhill.org/DocumentCenter/View/3681
Alt. Link Text:	Additional Info...
Show Archives:	No

Signal Hill Public Notice – Draft 2016 Hazard Mitigation Plan

MICHAEL S. LANGSTON
Chief of Police

POLICE DEPARTMENT

2745 Walnut Avenue • Signal Hill, California 90755 • (562) 989-7200 • FAX (562) 989-7293

Public Notice – Draft 2016 Hazard Mitigation Plan

Available For Public Review And Comment

The city of Signal Hill has prepared its draft update of the city Hazard Mitigation Plan. Residents may review a copy of the Plan by accessing the city Web page at

www.cityofsignalhill.org.

As an alternative, residents may view a copy of the Plan at the main desk in City Hall at 2175 Cherry Ave, Signal Hill. Ca. 90755. Comments on the plan should be addressed to:

Richard Johnson

Emergency Management Coordinator

Signal Hill Police Dept.

2745 Walnut Ave.

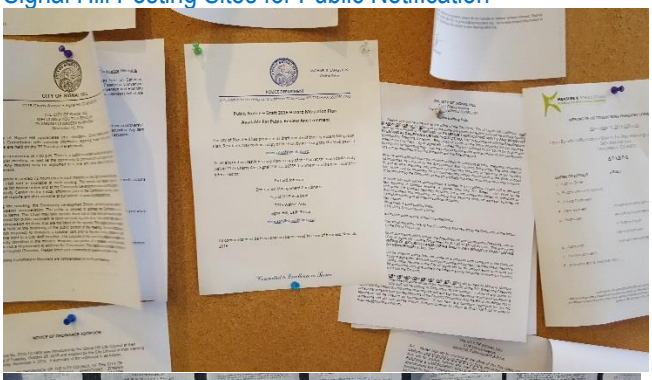
Signal Hill, Calif. 90755

rjohnson@signalhillpd.org.

All comments must be in writing and be received by close of business, Nov. 28, 2016.

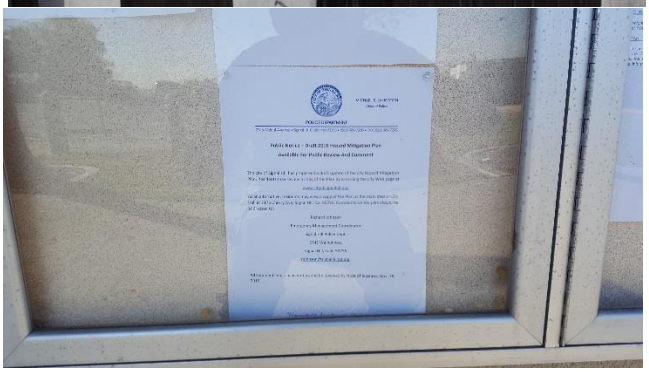
"Committed to Excellence in Service"

Signal Hill Posting Sites for Public Notification



Public Notice Posted at Signal Hill Reservoir Park

Public Notice Posted at Signal Hill Public Library



Public Notice Posted at Signal Hill City Hall