



PALMDALE GENERAL PLAN UPDATE

Natural and Manmade Hazards

SPRING 2020 | FINAL REPORT



Envision
PALMDALE 2045
a complete community

Chapter 14: Natural and Manmade Hazards

This chapter of the Existing Conditions Report addresses topics related to hazards and safety. This includes an overview of flooding, wildfire, geologic hazards, hazardous materials and exposure to toxics.

Key Findings

- Substantial flood hazards are limited to areas within and adjacent to Little Rock Wash, Big Rock Wash, and Amargosa Creek. Current stormwater runoff standards limit the potential for new development to substantially increase localized flooding.
- The western portion of the City in the foothills is subject to wildfire hazard. The interface of this wildland with urban development introduces wildfire hazard risk to adjacent urban areas.
- The San Andreas Fault runs through the western portion of Palmdale, making the City subject to a variety of geologic hazards including fault surface rupture, groundshaking, liquefaction, and landslides.
- Hazardous material contamination is not a major issue in the city. The primary source of soil and groundwater contamination is Air Force Plant 42.

Flooding

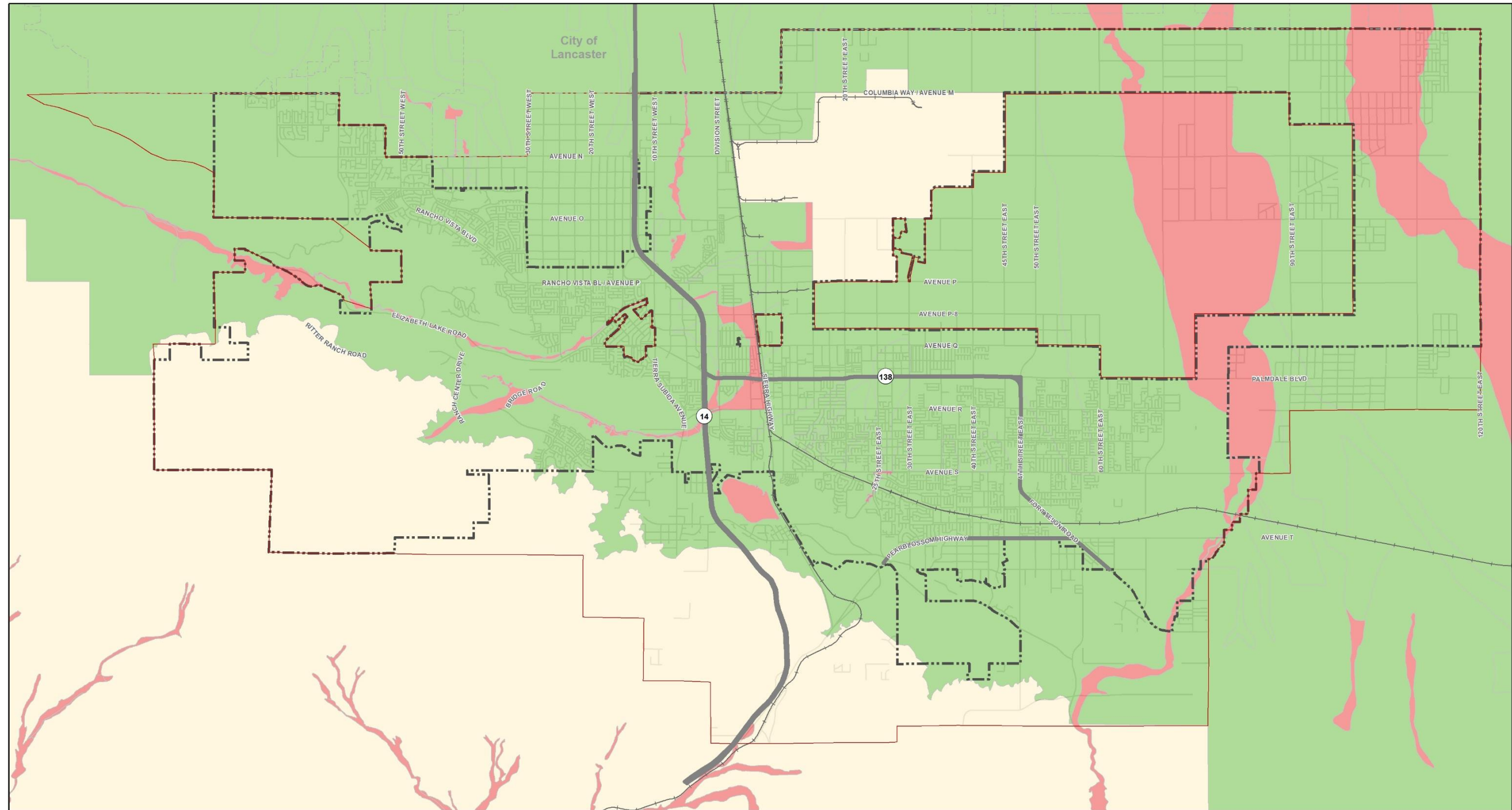
Rainfall in the city is sparse due to its location on the leeward side of the Sierra Pelona and San Gabriel Mountains. The typical amount of rainfall for Palmdale is about 7.4 inches per year. Nevertheless, periods of excessive rainfall can occur during winter storms, from October to March, and monsoonal thunderstorms during summer months.

Localized flooding occurs in Palmdale when rainfall is heavy and prolonged. Areas with flood hazards are the natural drainage channels of Amargosa Creek, Anaverde Creek, Little Rock Wash and Big Rock Wash, which are mapped in Figure 10.2 of the *Conservation and Open Space* section. These regions are subject to a one percent-annual-chance-flood, also referred to as a 100-year flood zone or high

risk area. Flat plains and natural depressions are also subject to flooding, some of which are in 500-year flood zones or low to moderate risk area. These include urban areas near the center of Palmdale and a region just to the east of Four Corners. Figure 14.1 depicts Federal Emergency Management Agency (FEMA) Flood Insurance Program designated flood zones in the City (FEMA 2008).

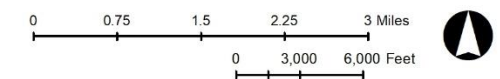
The increase of impermeable surfaces in urban areas has contributed to street flooding caused by storm water runoff. The City adopted a Drainage Master Plan in 1989 to address issues associated with storm water runoff from higher slopes and existing and future developments. The plan includes the construction of retention and detention basins, pipes, and channels throughout the City. Furthermore, a “small” Municipal Separate Storm Sewer System (MS4) permit was adopted by the City to legally discharge stormwater into local streams and rivers. To meet the terms of this permit, the Palmdale 2003 Storm Water Management Plan was adopted, which requires by City Ordinance that each development attenuate post-developed flows to 85 percent of pre-developed flows.

Figure 14.1 Palmdale Flood Hazard Zones



Flood Hazard Areas

- Moderate to Low Risk Areas
- High Risk Areas
- Undetermined Risk Areas
- City of Palmdale Boundary
- Sphere of Influence
- Other City Boundary
- Major Highway/Arterial
- + Railroad



Data Sources: City of Palmdale GIS data; FEMA, 2019.

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Wildfire Hazards

Wildfire risk is determined by a combination of factors including precipitation, winds, temperature, and landscape and vegetation conditions. Based on these factors, Palmdale has been identified by the California Department of Forestry and Fire Protection (CAL FIRE) as being within a wildland-urban interface, which includes areas where homes or other structures are built near or among lands prone to wildland fire (CAL FIRE 2001)

The area south and west of the California Aqueduct, including Ritter Ranch Park and the adjacent open space, within the Palmdale city limits, is a CAL FIRE recommended very high fire hazard severity zone under local responsibility (see Figure 14.2). This area consists of undeveloped open space, which is largely vegetated with typical chaparral, trees and grassland groundcover which provide fuel for wildfires (CAL FIRE 2012). Development within very high fire hazard severity zones is considered unsafe, as fire suppression is impeded by lack of water, rugged terrain, and delayed response times. The remainder of Palmdale is not under significant wildfire hazard risk. The sparse vegetation and urban development do not provide significant fuel for wildfire propagation.

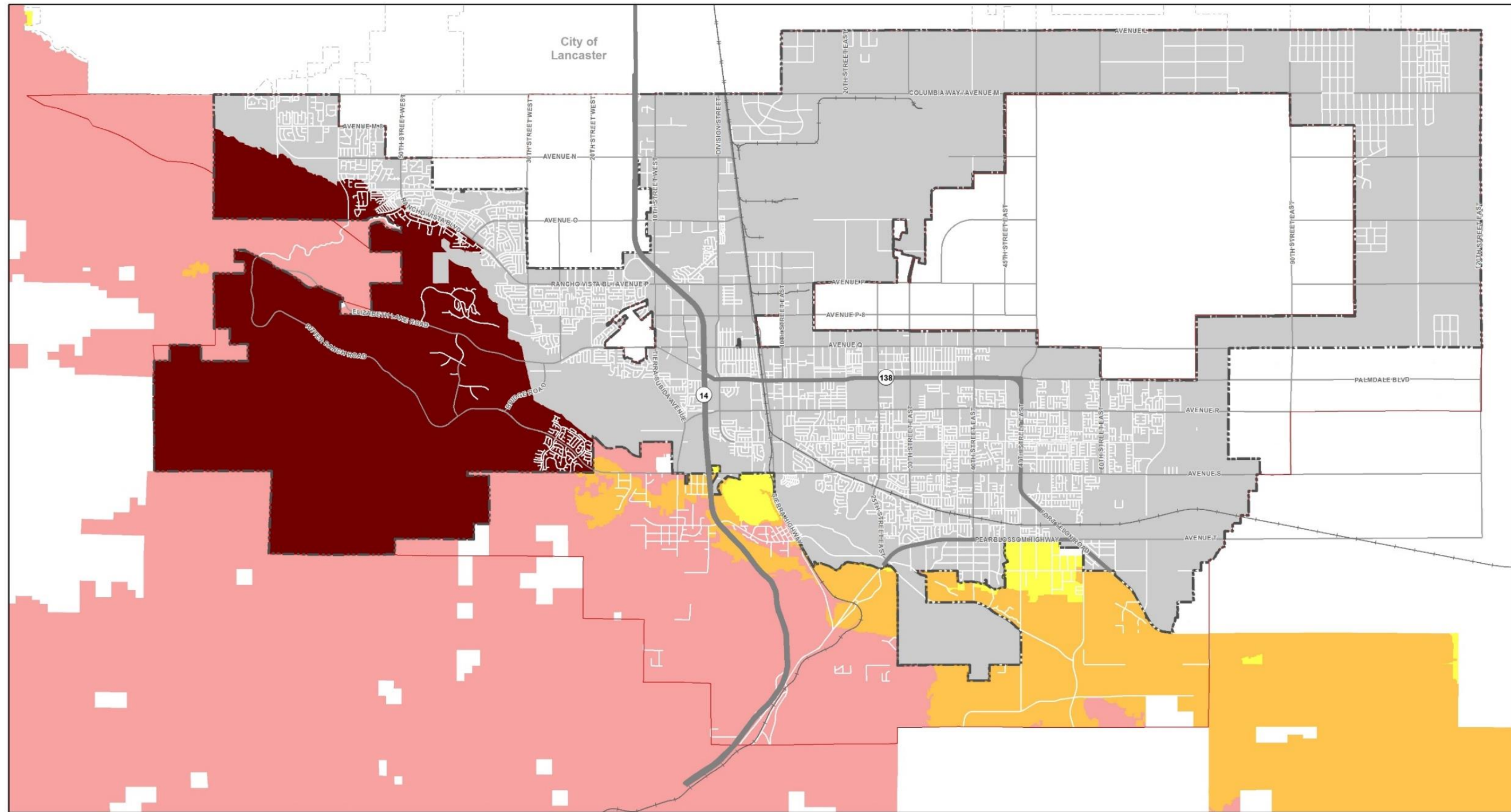
Areas adjacent to Palmdale that are subject to high and very high fire risk are also notable, since wildfires can spread rapidly and have widespread air quality impacts. To the south of the Palmdale city limit, but still within the Palmdale sphere of influence, are considered fire hazard severity zones that are state responsibility areas. These include moderate severity zones just south of Avenue S, between Sierra Highway and SR 14, and the area just south of where Pearblossom Highway intersects Fort Tejon Road; with high and very high fire hazard severity zones outside of these areas.

California environmental law and legislation require discussion of fire impacts in planning documents. Senate Bill 1241 requires cities and counties to address fire hazard impacts in a general plan safety element, specifically highlighting state responsibility areas and very high fire hazard severity zones. Senate Bill 1241 also requires agencies to ensure adequate fire protection and suppression services are available before approving new developments. Additionally, the 2019 California Environmental Quality Act update requires lead agencies to address the potential impacts of placing development in or near very high fire hazard severity zones.










The 1993 General Plan, Safety Element provides guidance for reducing wildfire hazard for urban areas near high fire hazard severity zones. Objective S1.3 calls for compatible development in areas within or adjacent to high fire risk zones. The policies adopted to obtain this objective include: creating fire resistant buffer zones for development near high fire risk zones, ensuring adequate vehicle access and evacuation/emergency routes are provided in and near high fire hazard zones, and the requirement of Fire Protection/Fuel Management Plans for developments adjacent to high fire risk zones.

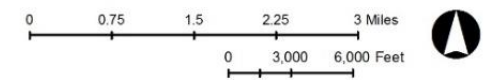
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Figure 14.2 Fire Hazard Severity Zones



Fire Hazard Zones

- | | |
|--|---|
|  Moderate, State Responsibility Zone |  City of Palmdale Boundary |
|  High, State Responsibility Zone |  Sphere of Influence |
|  Very High, State Responsibility Zone |  Other City Boundary |
|  Very High, Local Responsibility Zone |  Major Highway/Arterial |
| |  Railroad |



Data Sources: City of Palmdale GIS data; CAL FIRE. 2012.

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Geologic Hazards

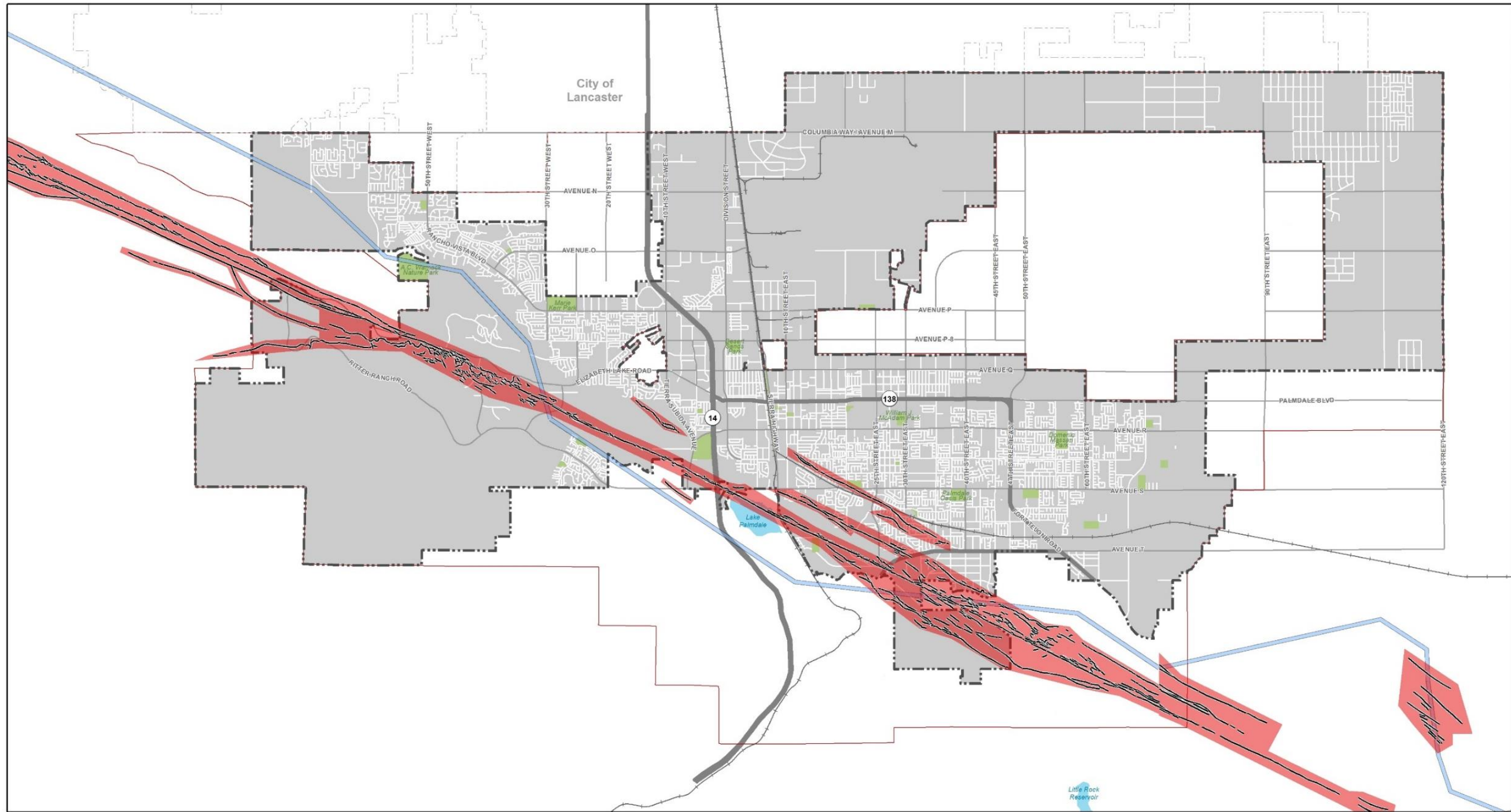
Fault Rupture

Palmdale lies within a seismically active area. Several faults in the City are capable of producing fault rupture hazards in the event of an earthquake. Faults in the City include the San Andreas, Nadeau, Cemetery, Little Rock, and Leona Avenue. All of these are considered active or potentially active. It is estimated that large and potentially destructive earthquakes occur on the San Andreas Fault about every 130 years. Figure 14.3 shows the location of local faults and the earthquake fault zones where there is the potential for surface rupture.

The Alquist-Priolo Earthquake Fault Zoning Act requires State Geologists to delineate “special study zones” along known active faults. The San Andreas Fault zone is among those identified; therefore, the City is required to regulate development within these seismic hazard zones. The City implements the Alquist-Priolo Earthquake Fault Zoning Act by means of development review process, in which every proposed development within a seismic hazard zone is required to prepare a detailed geotechnical report and fault rupture survey.

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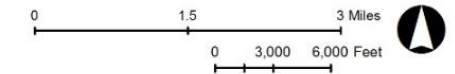
Figure 14.3 Fault Traces and Hazard Zones



Faults

- Fault
- California Aqueduct
- Fault Zone
- Major Highway/Arterial
- ▭ City of Palmdale Boundary
- Railroad
- ▭ Sphere of Influence
- Park
- ▭ Other City Boundary
- Water Body

Palmdale General Plan Update



Data Sources: City of Palmdale GIS data;
California Geological Survey, 1979; USGS.

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Ground Shaking

The intensity of ground shaking during an earthquake is dependent upon the distance from the fault; the magnitude and failure mechanism of the earthquake; and the nature of the bedrock, alluvium, and soil through which the shock waves travel. In addition to faults in the city, the Sierra Madre-San Fernando, Garlock, Owens Valley, and White Wolf faults are capable of producing ground shaking which could impact Palmdale. Generally, shock waves weaken with distance from the focus of the earthquake; therefore, faults located further away from the city are likely to have a lesser impact.

Palmdale lies in the northern portion of Los Angeles County, through which the San Andreas Fault runs. The city's proximity to this major fault makes it susceptible to the highest level of earthquake hazard risk related to ground shaking (USGS 2003). The fault is estimated to be capable of producing earthquakes of magnitude 8.0 or greater.

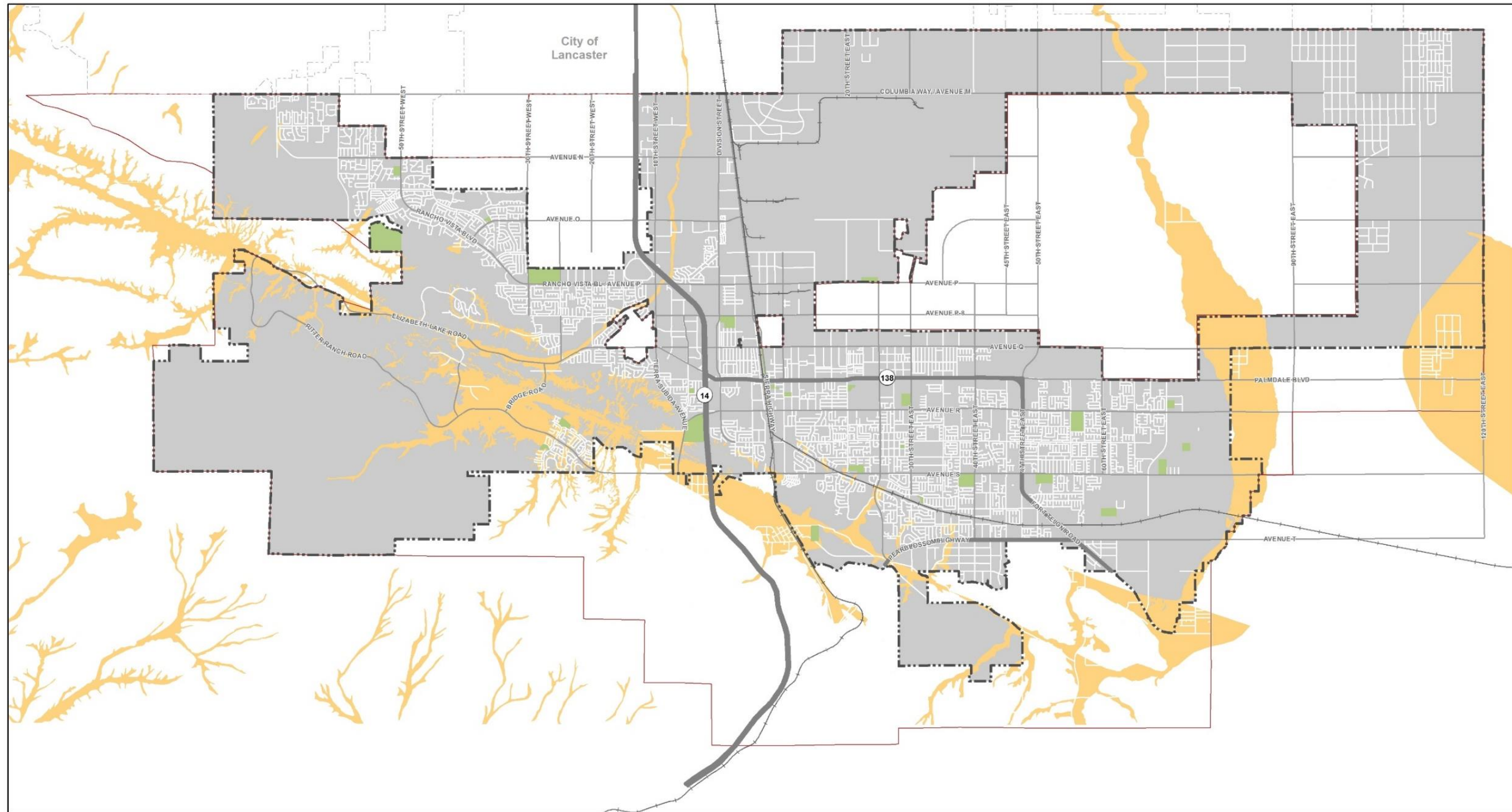
In response to the increased seismic hazards, the 1993 General Plan, Safety Element Policy S1.1.3 requires geotechnical studies to be approved by the City's geologist for development proposals where geologic hazards exist. Additionally, all construction in Palmdale must adhere to the Palmdale Building Code and California Building Code, as outlined in section 8.04 of the Palmdale Municipal Code, which implement strict regulations for construction on and near active faults.

Liquefaction

Liquefaction occurs when soil that exists below the water table temporarily loses strength during an earthquake and changes to a near-liquid state. Liquefaction can cause large movements of the ground and damage buildings and buried utilities. A related occurrence, known as lateral spreading, can cause damage to structures located on gently sloping ground. Figure 14.4 shows liquefaction risk zones within Palmdale. The majority of Palmdale consists of low relative liquefaction susceptibility zones, which are indicated on the map as non-shaded areas. However, liquefaction risk zones are present in the City. These areas include Little Rock Wash in the eastern portion of the City as well as Anaverde Creek, and areas along the San Andreas Fault. Development in liquefaction risk zones is subject to the same regulations as described for ground shaking hazard; a geotechnical study is required along with compliance with the Palmdale Building Code and California Building Code.

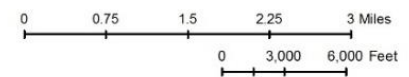
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Figure 14.4 Liquefaction Risk Zones



Liquefaction Risk

- Seismic Hazard Liquefaction Zones
- City of Palmdale Boundary
- Sphere of Influence
- Other City Boundary
- Major Highway/Arterial
- Railroad



Data Sources: City of Palmdale GIS data;
California Geological Survey, 2005, USGS.

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Landsliding

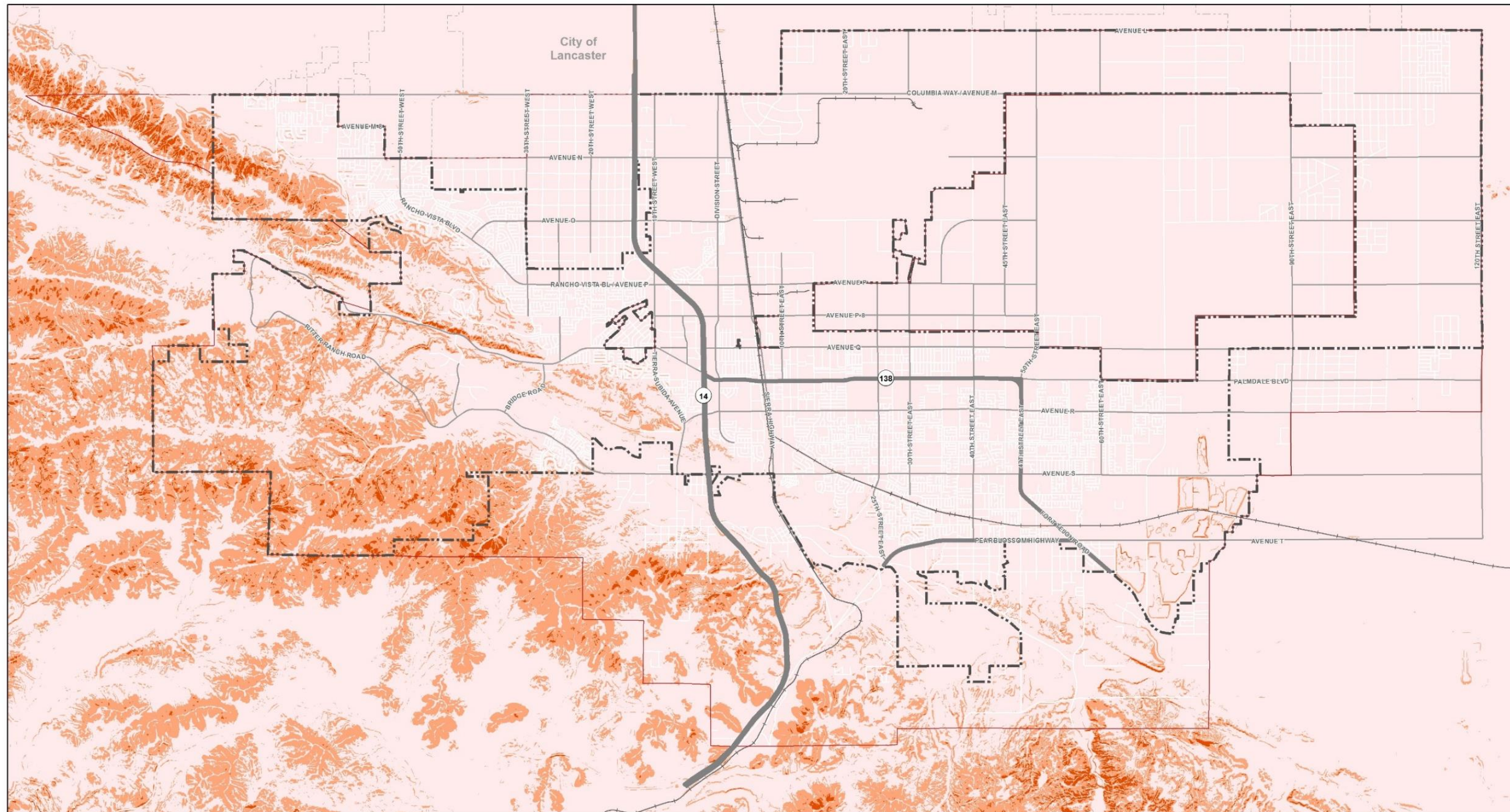
Slopes greater than 25 percent are considered unsafe for development as they typically have high risk of landslides. Slopes ranging from 10 to 25 percent are required to implement hillside construction techniques to reduce risk of landslides, while slopes lower than 10 percent are considered to have low landslide risk. As shown in Figure 14.5, the southern and western edges of Palmdale contain steep hillsides with slopes greater than 25 percent that are susceptible to landslides. The remainder of the Planning Area is relatively flat, with low landslide risk.

The Palmdale Hillside Management Ordinance

Palmdale Municipal Code, Chapter 17.100 was adopted to establish hillside development standards to prevent landslide and erosion hazards. The Ordinance establishes the maximum angle and height of manufactured slopes and maintenance of natural drainage.

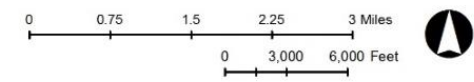
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Figure 14.5 Palmdale Slope Map



Slope Map

- | | | |
|------------------------|---------------------------|------------------------|
| Slope (Degrees) | City of Palmdale Boundary | Major Highway/Arterial |
| 0 - 5 | Sphere of Influence | Railroad |
| 5 - 10 | Other City Boundary | |
| 10 - 25 | | |
| >25 | | |



Data Sources: City of Palmdale GIS data.; USGS, 2019.

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Hazardous Materials / Exposure to Toxic Substances

Hazardous Materials Sites

A wide variety of products, chemical and purified chemical compounds, and elements that are considered hazardous or toxic are used in households, commercial businesses, and industrial operations and processes. They range through home and pool related chlorine products, chemical fertilizers, herbicides and pesticides, stored fuels and waste oil, chemical solvents and lubricants, and a variety of medical materials. The improper use and management of hazardous materials can pose a significant potential threat to the community and its environment.

Leaking underground storage tanks (LUST) and former industrial and commercial land uses sites can expose the community and environment to hazardous materials. Gasoline storage tanks from previous or existing gas stations are subject to leaking over time, which can contaminate soil, groundwater or surface water. Leaks require immediate action upon detection to reduce the spread of contaminants and reduce potential harm. Industrial and commercial activities sometimes utilize hazardous and toxic chemicals for operations, and spills or mishandling of these materials can result in site contamination. These sites are known as “brownfields”, and their clean-up and revitalization is regulated by the U.S. Environmental Protection Agency.

A number of hazardous material sites are located in Palmdale. These include leaking underground storage tanks (LUST) and contaminated groundwater sites under the jurisdiction of the State Water Resources Control Board Site Cleanup Program. While many of these sites have been remediated or closed, there are five open or active cleanup sites in the City and its sphere of influence, which are listed in Table 14.1 with their locations shown in Figure 14.5.

Table 14.1 Palmdale Active Hazardous Waste Sites

Site Name/ Site ID	Site Type	Site status	Address	Contaminants Present
Circle K Store # 2709464 (T10000012661)	LUST Cleanup site	Open – eligible for closure as of 2/28/2019	520 W Rancho Vista Blvd.	None specified
Petro-Lock Inc. (T0603700266)	LUST Cleanup site	Open- Site Assessment as of 3/18/2019	38206 Sierra Hwy. N	Gasoline
Shayan Capital Ventures (T10000012057)	LUST Cleanup site	Open- Site Assessment as of 9/17/2018	103 W Palmdale Blvd.	Diesel
Palmdale Water Reclamation Plant (T10000004967)	Cleanup Program Site	Open - Assessment & Interim Remedial Action as of 10/15/2006	39300 30th Street East	Nitrate
Air Force Plant 42 (Multiple)	Military Cleanup site	Open	2503 East Avenue P	Metal, VOCs, Trichloroethylene Cyanide

Source: California Water Resources Control Board. Geotracker. <https://geotracker.waterboards.ca.gov/>. Accessed March 21, 2019.

U.S. Air Force Plant 42 in the northern portion of the city contains a number of hazardous material and waste site designations. The base is used for U.S. Air Force contracted aircraft manufacturing and maintenance. The site is a designated Military Cleanup Site regulated by the Air Force and the Lahontan Regional Water Quality Control Board. Numerous cleanup sites in the Air Force Plant 42 area are currently open and in remediation status. A wide variety of materials are present on the base, including industrial chemicals, discharged fuel, paint and other metals.

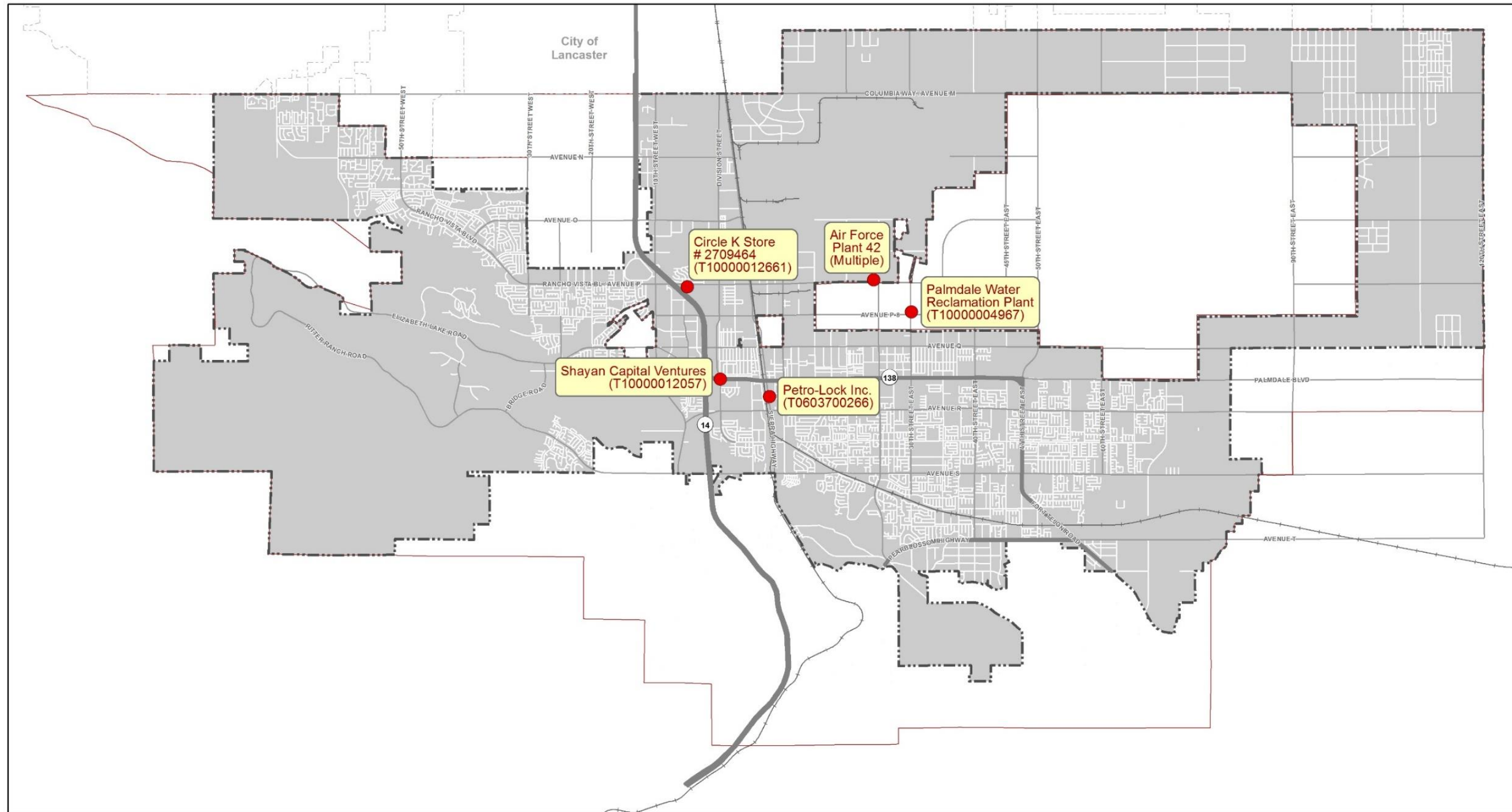
Palmdale has the responsibility to coordinate with the appropriate agencies in the identification of hazardous material sites and the active regulation of their timely cleanup. Programs of oversight and management between responsible agencies is most efficiently implemented through regular consultation with the Lahontan Regional Water Quality Control Board and the Los Angeles County Health Department and by updating information on hazardous material sites and monitoring facilities that utilize or produce hazardous materials within the City. The City maintains current information regarding the monitoring and regulating of underground storage tanks and septic systems and regulation of the transport of hazardous materials through the City.

Policy Guidance

1993 General Plan, Safety Element

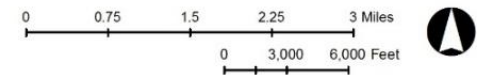
Palmdale's 1993 General Plan, Safety Element provides guidance for the protection of the public from hazardous materials. Policies include the prohibition of land uses and activities that generate excessive amounts of hazardous materials or waste, and continued compliance with state and local requirements for hazardous waste generation monitoring and hazardous material site management. Furthermore, all proposed hazardous waste facilities must comply with the City's hazardous waste management plan, and Chapter 90 Article 96 of the Palmdale Municipal Ordinance, which regulates hazardous waste facility zoning.

Figure 14.6 Active Hazardous Waste Sites



Hazardous Waste Sites

- Hazardous Waste Sites
- Major Highway/Arterial
- City of Palmdale Boundary
- Railroad
- Sphere of Influence
- Other City Boundary



Data Sources: City of Palmdale GIS data;
California Water Resources Control Board, 2019.

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