CITY OF

# HERCULES

# SAFETY ELEMENT

Final – Adopted May 2021

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SECTION 1.

# INTRODUCTION & OVERVIEW

# 1. INTRODUCTION & OVERVIEW

The Safety Element is the primary document for linking land use and conservation decisions to local safety planning. The goal of the element is to reduce the potential short- and long-term unreasonable risk of death, injuries, property damage, and economic impacts resulting from the effects of natural and non-natural hazards. The safety element is one of the nine state-mandated elements of the general plan. The minimum content is legally mandated by Government Code Section 65302(g). Additional issues included in the Safety Element are at the discretion of the local government. This safety element includes: general hazard, risk reduction, and avoidance strategies; climate change vulnerability and measures to address those vulnerabilities; emergency response priorities; and comprehensive hazard mitigation to minimize disruption and expedite recovery following disasters. The element is linked– by attachment–to the City of Hercules Local Hazard Mitigation Plan.

The Safety Element addresses public safety through analysis of existing hazard conditions that have the potential to cause loss of life, injury, property damage, economic loss, and social dislocation. For Hercules, these conditions and hazards include seismic and other geologic hazards, sea-level rise and flooding, urban and wildland fires, and hazardous materials. (Hazardous materials are addressed in the Hazardous Waste Management Plan Element.) In addition to these natural hazards, the community has expressed concerns, addressed in this element, about: oil and gas spills; power outages; active shooter; hazardous materials; and epidemics.

The city cannot be made hazard free, but the planning process can be used to minimize exposure to dangerous conditions. This is the concept of acceptable risk and it is an inherent part of the environmental planning process. Every community must decide what public safety standards are acceptable and the actions needed to maintain those standards. For planning purposes, an acceptable level of risk is one at which a hazard is deemed to be a tolerable exposure to danger, given the expected benefits to be gained. For some types of risk, numerical measures have been defined to identify the threshold of acceptable risk. In the case of seismic or flooding hazards, for example, specific locations may be identified for development mitigation based on their distance from known faults or location within an area of or designated flood zone.

The impacts of climate change pose an increasing and growing challenge to the safety and wellbeing to the residents of Hercules. California will continue to experience effects of climate change in different ways, including increased likelihood of drought, flooding, wildfires, heat waves, severe weather, and sea-level rise. In addition to climate change planning becoming necessary on its own merits, SB 379, requires cities on or after January 1, 2017 to update their safety element to address adaptation and resiliency strategies applicable to that city.

## PLANNING PROCESS AND PUBLIC OUTREACH

This Safety Element comprehensively updates the city's previous Safety Element adopted in 1998. An update of the Safety Element was needed given the land use and regulatory changes that have taken place over the last 20 years, and in response to the ongoing evolution in technology. The City of Hercules formed a Steering Committee (comprising: the City Manager; Public Works Director / City Engineer; Finance Director; Parks and Recreation Director; Police Chief;

Community Development Director; and the Fire Chief from the Rodeo–Hercules Fire District) to decide the project goals, public outreach, policies, and programs.

The city's website was updated with information about the importance of the Hazard Mitigation Plan and the Safety Element update, with links to a community survey, public workshop information, and draft and final documents, as well as details of the project status.

The City of Hercules, with its partner Cal OES (Office of Emergency Services), hosted a community workshop in September 2019. Cal OES had an information table with material on preparedness and answered public questions. The staff/Cal OES presentation included an overview on the General Plan – Safety Element, the purpose of Contra Costa County Hazard Mitigation Plan and why the city was writing one, the timeline to completion, and the opportunities for public input. The questions asked of the public included:

- What types of disaster are you and your family concerned about?
- What issues and response do you believe will arise out of and be needed during a disaster?
- Are you and your family prepared for a disaster? How have you prepared for fire, flood, landslide, earthquake, rail derailments, or other?
- What do you believe should be the City's priorities regarding disaster?

The City received a combination of verbal and hand-written comments from workshop attendees. In addition, a map was available with pens/note cards and pins for the public to identify hazard and safety areas of concern and to recommend improvements.

In addition, a citywide online survey was conducted from October 2019 through January 2020, with 62 responses to the following questions:

- What natural hazard events have you experienced in Hercules?
- How concerned are you about these natural, and non-natural hazards in Hercules?
- How would you expect to be notified in case of an immediate threat cause by a local hazard?
- What steps have you done to prepare for a local hazard event?
- How prepared is your household without electricity or natural gas for 1-5 days?
- When you moved to Hercules, was impact from hazards a consideration?
- If you received real estate disclosures, was a hazard explained to you?
- What is your primary language?
- What additional education and programs would reduce risk exposure?

The survey was the same as completed by Contra Costa County, and helped gauge the public's understanding of citywide hazards, identify ways the City might educate the public about hazards, and guide the development of the hazard policies and programs.

Feedback from the public was received in June 2020 at a second workshop on the draft Safety Element and the accompanying City of Hercules Local Hazard Mitigation Plan. The purpose of this second workshop was to (a) inform

the public of the responses staff received during the first public workshop and from the online survey and how those responses were addressed in the draft document, and (b) to receive feedback on the draft content before going to City Council.

# COMMUNITY PROFILE

Hercules is located in the western portion of Contra Costa County, one of the nine counties comprising the San Francisco Bay Area. According to the 2018 American Community Survey 5-year Estimate the City of Hercules population is 25,343 with an annual population increase of less than 1%. When analyzing the risk of natural and non-natural hazards to the residents of the city there are populations that could be impacted to a greater extent because of age, disability, poverty, and language. The city has a slightly higher median household income then Contra Costa County, $110,476 and $93,712, respectively. The poverty rate in the city is 4.2% which is also lower than the County rate at 7.8%. There are approximately 2,332 people, or 9.2% of the population living with a disability in the city. Hercules also has a high percentage of households that speak a language other than English at home (Figure 3). Of the 11,991 residents that speak another language at home 15.7% report speaking English less than "very well". Adults who are not able to speak English well often have trouble talking to those who provide social services and medical care. As a result, they might not get the health care and information they need. Linguistically isolated households (Figure 2) may also not hear or understand important information when there is an emergency such as a wildfire or earthquake.

*Figure 1. Population Graph*

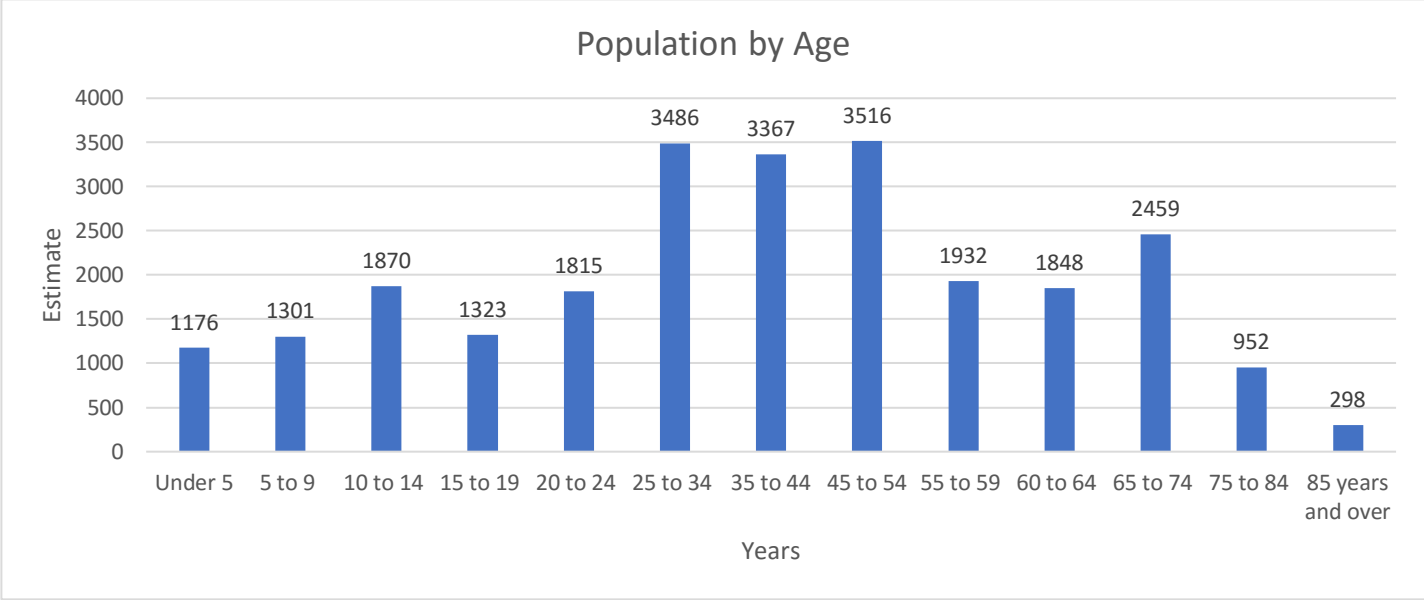



*Figure 3. Language Spoken at Home*

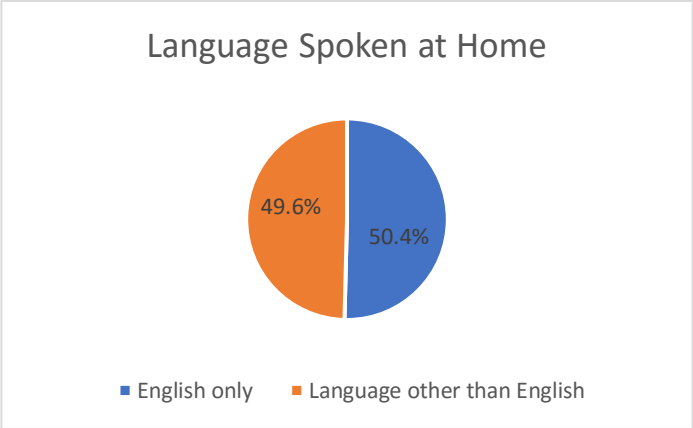
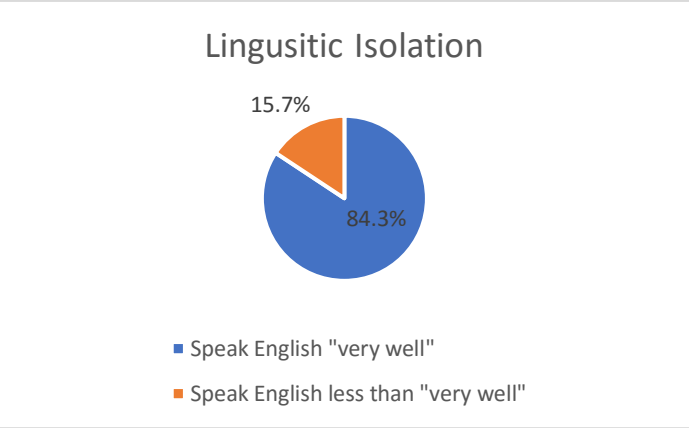



*Figure 2. Linguistic Isolation*



### SENATE BILL 535 – DISADVANTAGED COMMUNITIES

Disadvantaged communities in California are specifically targeted for investment of proceeds from the State's cap-and-trade program. These investments are aimed at improving public health, quality of life and economic opportunity in California's most burdened communities at the same time reducing pollution that causes climate change. Hercules does not have disadvantaged communities defined within the city limits and would not qualify for targeted investments (Figure 4).

**DISADVANTAGED COMMUNITY**

"Disadvantaged communities' means an area identified by the California Environmental Protection Agency Pursuant to Section 39711 of the Health and Safety Code or an area that is a low-income area that is disproportionately affected by environmental pollution and other hazards that can lead to negative health effects, exposure, or environmental degradation." (Gov. Code, § 65302, subd. (h)(4)(A)).

### SENATE BILL 1000 – ENVIRONMENTAL JUSTICE

As part of updating the Safety Element the planning team reviewed the requirements for adding a stand-alone Environmental Justice (EJ) Element to the General Plan or integrating EJ goals and policies into the Safety Element Update. Local jurisdictions are required to incorporate EJ in their general plan if they have a disadvantaged community and are concurrently adopting or revising two or more elements of their general plan. CalEPA's Office of Environmental Health Hazard Assessment developed CalEnviroScreen which provides statewide data that can be used to identify communities disproportionately impacted by environmental pollution and identify disadvantaged communities. CalEnviroScreen identifies 20 indicators which measure Exposure, Environmental Effects, Sensitive Populations and Socioeconomic Factors (Table 1). To get the CalEnviroScreen score the Pollution Burden score is multiplied by the Population Characteristics score. The five census tracts that cover the city all rank between the eleventh and fortieth percentile compared with all census tracts in California (Figure 5). After reviewing the cumulative score for the city, the Steering Committee concluded that an Environmental Justice Element would not be relevant to the communities needs at this time.

*Table 1. CalEnviroScreen Methodology*

| Pollution Burden | Population Characteristics |
|---|---|
| **Exposure**<br>• Ozone<br>• PM2.5<br>• Diesel PM<br>• Pesticide Use<br>• Traffic<br>• Drinking Water Contaminants<br>• Toxic Releases from Facilities | **Sensitive Populations**<br>• Asthma<br>• Cardiovascular Disease<br>• Low Birth-Weight Infants |
| **Environmental Effects**<br>• Solid Waste Sites & Facilities<br>• Cleanup Sites<br>• Groundwater Threats<br>• Impaired Water Bodies<br>• Hazardous Waste Generators & Facilities | **Socioeconomic Factors**<br>• Poverty<br>• Unemployment<br>• Educational Attainment<br>• Linguistic Isolation<br>• Housing Burdened Low Income Households |

*Figure 4. Disadvantaged Communities*

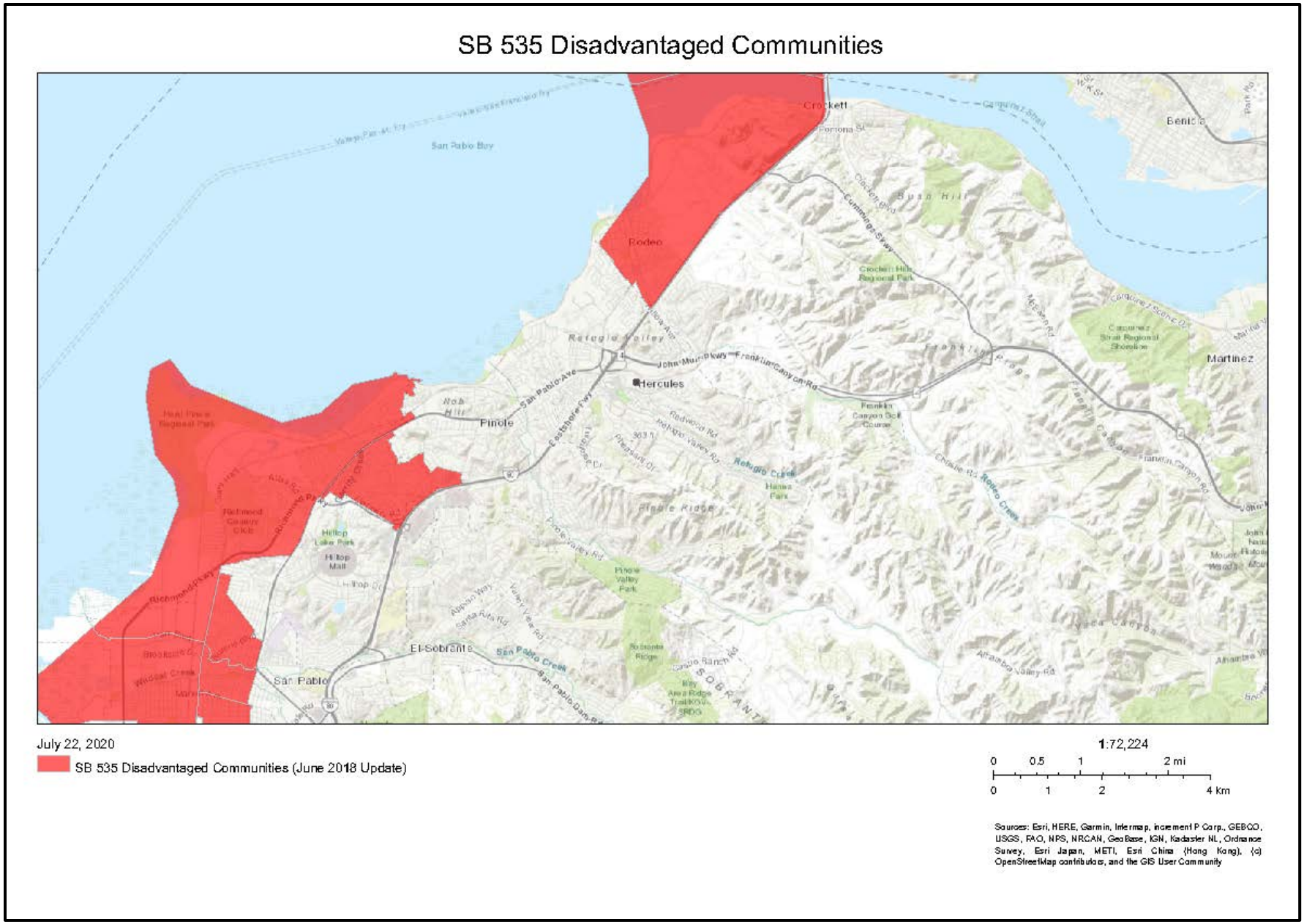
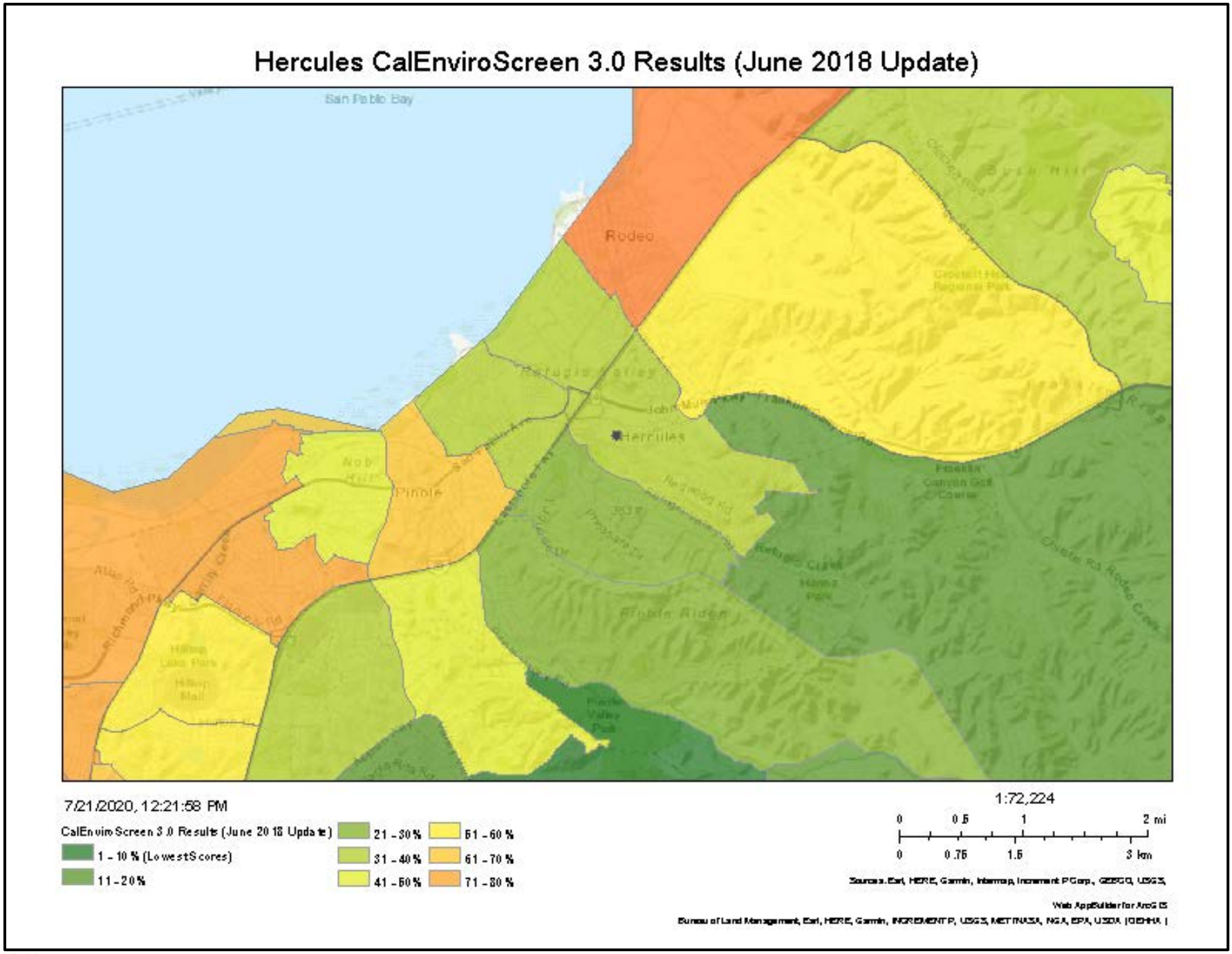


*Figure 5. CalEnviroScreen*



# GENERAL PLAN POLICIES

The Hercules General Plan consists of an introduction and nine separate elements. The Safety Element has correlations to all the state-mandated elements of the General Plan except noise. By state law, the land use and conservation elements are statutory elements with mandatory interrelated content.

# RELATIONSHIP TO GENERAL PLAN

The following section discusses the relationships between public safety and various elements of the General Plan.

### LAND USE ELEMENT (ADOPTED 1998)

Hercules envisions itself as a balanced community with a sound complement of residential and commercial uses and services. Hercules is a community of families. According to the U.S. Census, the total population estimate in 2018 was 25,601 with 47% of the population being of Asian descent, 28% White, and 15% each of Black and Hispanic. Upon build-out the total number of housing units will total 8,490. In 2018, over 80% were owner-occupied with an average of 3.12 person per household. The median household income in 2018 was $110,476. From a business perspective, there were 1,630 firms in 2012, with a majority being women- and minority-owned firms. The key industry sectors in Hercules include:

- Health Care and Social Assistance (19.6%)
- Retail Trade (11.1%)
- Professional, Scientific, and Technical Services (10.6%)
- Hospitality and Food Services (9.4%)

Major employers include Bio-Rad Laboratories, West Contra Costa Unified School District, and Mechanics Bank.

For each area of the City, the Land Use Element establishes permitted land uses, including the distribution, location, and extent of housing, business, industry, open space, education, public building, waste disposal facilities, and other categories of public and private land uses. The emphasis is on the intended future development of the city. The Land Use Element recognizes that site-specific development constraints such as geotechnical conditions, topography, grading impacts, environmental issues, faults, drainage, archeology, and other facts, could limit the use of a property or limit the development to less than the intensity or density standards set forth in the land use map.

State law requires consistency between each element of the General Plan, including the Land Use and Safety Elements. Several policies and programs in the Land Use Element are relevant to public safety:

- **Policy 6C.** Wetlands mitigation, flood control improvements, and riparian corridors should not be used in the calculation of required park space, parks, or recreational areas. However, the City may accept such calculation of required park space if they are accessible to the general public for use and recreation.

- **Policy 11B.** Participate in regional and sub-regional planning and traffic issues to better address the potential regional impacts upon the community.

- **Policy 13B.** Design of flood control improvements along Refugio Creek should be coordinated with appropriate resource agencies and done in a manner to function as a transition area between land uses.

- **Policy 13C.** Strongly encourage cooperation and joint planning by and among owners of large parcels during land use planning and entitlement process; this effort would include such items as master hydrology and circulation plans, joint studies, and cooperative infrastructure development.

- **Program 14A.3** Continue to improve and protect Refugio Creek as a major environmental amenity.

- **Program 14A.4**. Require a minimum 50 ft. setback between development and the "top of bank" of the lower Refugio Creek and Rodeo Creek corridors, except that the setback may be reduced for the west branch of Refugio Creek if the 50 ft. setback proves infeasible. This buffer will be included as part of any enhancements required by regulatory agencies or proposed by the developer. Riparian areas which are culverted, or underground will be excluded from the buffer requirement.

- **Policy 14B.** Preserve the existing natural topography, ridgelines, and valleys where feasible and desirable.

Though not covered in the Land Use Element, the City has three designated Priority Development Areas (PDA) served by existing utilities and infrastructure, and easily accessible to public transportation. The purpose of a PDA is to address climate change by reducing vehicle miles traveled and associated greenhouse gases. The three Hercules PDAs are: Waterfront District; San Pablo Avenue Corridor; and Central Hercules.

All land use decisions are governed by the California Environmental Quality Act (CEQA), which requires state and local government agencies to inform decision makers and the public about the potential environmental impacts of proposed projects, and to reduce those environmental impacts to the extent feasible. Among the potential effects that must be analyzed are "any significant environmental effects the project might cause by bringing development and people into the area affected." For example, proposing a subdivision astride an active fault line should be identified as having a potentially significant effect since the subdivision would have the effect of attracting people to the location and exposing them to the seismic hazards found there.

### OPEN SPACE & CONSERVATION ELEMENT (ADOPTED 1998)

Hercules is a semi-urban, largely built-out community with several natural resources, including upland open space hills, waterfront, creeks, and wetlands. Sensitive habitats exist in the wetlands along the San Francisco Bay shoreline, along Refugio Creek, and in the open space hills. The City has approximately over 800 acres of open space with trails, predominately located along Refugio Creek and the hills on the east side of the city.

The city has the 55-acre Refugio Valley Park consisting of Refugio Lake, which acts as a water collection and filtering body for the upper watershed of Refugio Creek and adjacent neighborhoods. The 26-acre San Pablo Bay waterfront park are a buffer for sea-level rise, and the East Bay State Regional Park District lands pond acts as a rainwater capture

and filter for upland road and property run-off before exiting to the Bay. A 1986, Shoreline Feasibility Study identified future trail alignments for pedestrian, bicycle, and equestrian trails linking the shoreline and Historic Hercules to San Pablo Avenue. Boardwalks exist and are planned in these areas over the marsh/wetlands inland and parallel to the shoreline. These conservation areas are important for climate change resiliency and reducing vehicle miles traveled by single occupancy vehicles.

The City of Hercules is bordered by San Pablo Bay, and is influenced by its waves, tides, salinity, and sea-level rise, however based upon current science the impact is exclusively on undeveloped shoreline. The City of Hercules is within three major drainage basins, all which outfall into San Pablo Bay and are tidal influenced. Refugio Creek is the main drainage feature within the City. Localized flooding is a recognized hazard in some areas of Hercules but does not threaten structures. Storm water flooding of Refugio Valley occurs during periods of heavy rainfall and runoff, coincident with high tides affecting Refugio Creek. A backwater effect is created that prevents effective flood water discharge to San Pablo Bay. Extensive flooding of Refugio Creek occurred during severe storms of January 1983, with the creek overflowing its banks. Flood improvements to and around Refugio Creek since then have removed areas within a 100 –year floodplain.

Potable water is supplied by East Bay Municipal Utility District, which has done extensive work on retrofitting and upgrading its system to be more resilient to earthquake and flooding. A portion of the system providing water to residential and commercial properties located in lower elevations of between 0 and 400 feet mean sea-level is provided by a cascade water and pump system. For build-out of the Waterfront District PDA, capital improvements will be required including pumping plants, storage tanks, and distribution pipelines.

Wastewater treatment is provided by the Pinole-Hercules wastewater treatment plant, which is located within the expected sea-level rise area along the waterfront. Major capital improvements to address climate change resiliency for operation and maintenance were completed in 2020.

The Open Space/Conservation Element provides goals, objectives, and policies for recreation, open space, and natural resources management. There is an opportunity with future updates of this Element to address the hydrology and resiliency requirements of sea-level rise. Several policies and program in the Open Space/Conservation Element are relevant to public safety:

- **Program 1a.1 (1)** The major riparian system of Refugio Creek east of I-80 will be enhanced by planting appropriate vegetation, and small ponds designed to reduce the velocity of water and possible erosion in riparian areas.

- **Policy 2a.** The City shall require project proponents to design construction footprint to avoid any wetlands and buffer zones around wetlands.

- **Program 2.a.2.** If flood control improvements are required along Refugio Creek it should be wide enough to provide for native vegetation, wildlife habitat, and a transition area between land uses and the natural community.

- **Policy 4a.** The City shall require project proponents to design facilities to prevent degradation of riparian and wetland communities from urban pollutants in storm runoff.

- **Policy 5a.** Buildings shall be located on existing developed or graded areas. The city shall review development proposals for consistency with minimizing impacts to salt marsh zones.

- **Policy 6b.** The City shall require that development within the General Plan area incorporate features to preserve habitat for sensitive species.

- **Policy 6c.** As much open space within development sites shall be retained as informal open space for wildlife with native plants versus formal, landscaped parks, or grounds.

- **Policy 9a.** Develop a Master Water Quality Control Plan to include measures to clean-up existing contaminated water resources in various parcels, to identify and enforce the mitigation of existing pollution sources and prevent further pollution from surface run-off.

### HOUSING ELEMENT (ADOPTED 2015)

The Housing Element focuses on the community's housing needs and strategies. In the last few decades, the population in the City of Hercules has increased 2% per decade, slower than the County as a whole. The population projections in the city are expected to increase over 15% per decade by 2040, faster than the County. Historically, housing construction has been primarily single-family homes, but rising land and construction costs are resulting in an increase in multi-family homes. Providing adequate housing for all income levels reduces the vehicle miles traveled for people driving further from their workplace to afford housing. The policies and programs in the Housing Element relevant to public safety are as follow:

- **Policy 2.5.** Enforce adopted code requirements that set forth the acceptable health and safety standards for the occupancy of housing units.

- **Program 2c.** Provide assistance to extremely low income to low income owner-occupant households to make repairs to homes to correct health and safety deficiencies, repair or replace major building systems or improve energy efficiency.

- **Policy 3.3.** Encourage development of residential uses in strategic proximity to employment, recreation, schools, commercial and transportation routes.

- **Policy 6.1.** Promote the use of Green Building techniques in residential development.

- **Policy 6.4.** Seek opportunity to educate the public about energy conservation.

- **Program 6a.** Encourage developers to exceed the Cal Green requirements.

### HAZARDOUS WASTE MANAGEMENT PLAN (ADOPTED 1990)

In the 1900s, the City of Hercules began as a company town, known for its production of dynamite and gunpowder. In 1964, production of fertilizer replaced the production of dynamite and black powder. Hazardous materials, utilities production, and distribution have historically existed in the community side-by-side with residential and commercial uses. Pacific Gas and Electric (PG&E) maintains an electricity substation along Willow (formerly Bayberry) Avenue (east of the I-80 off-ramp). There are underground oil and gas pipelines that traverse the City. In addition, a waterfront railway distributes goods and hazardous materials through the city to Chevron and waterfront shipyards in Richmond.

The Hazardous Waste Management Plan recognizes that the safe and effective management of hazardous waste will protect public health and the environment in the City of Hercules. The Element focuses on land uses and facility siting criteria, inventory of existing waste facilities, hazardous material transportation, and effective management. Since 1990, industrial production and storage of hazardous materials has ceased, and large areas of legacy contamination have been cleaned up the city could benefit from updating the plan to reflect current conditions and goals. Implementation programs that relate to the Safety Element include the following:

- Public education and participation;
- Data collection and analysis;
- Proper siting of treatment, storage, and disposal facilities;
- Appropriate transport of hazardous waste;
- Evaluation and implement a tank, waste, and materials storage program;
- Ongoing implementation of site cleanup program;
- Education about hazardous waste disposal, with education materials, information hotline, and waste consolidation program;
- Household waste reduction program;
- Emergency response program with Rodeo-Hercules Fire Protection District.

### GROWTH MANAGEMENT (ADOPTED 2013)

The City of Hercules Growth Management Element was adopted by City Council to implement the Measure J voter-approved Growth Management Plan. At stake was the sales tax funding through 2034 to be used for: transportation improvements identified in Measure J; paratransit programs; and Local Street maintenance and Improvement or "return-to-source" funds. In order to access and benefit from these and other funds—such as Transportation for Livable Community Funds from the Transportation Authority—the city completed a number of growth management-related actions, including: the Growth Management Element; maintaining the Urban Limit Line; adopting a Transportation Systems Management Plan; and implementing a five-year Capital Improvement Program. Standards from the Growth Management Element relevant to public safety are as follows:

- **Traffic Service Standards** – Implementing Policies and Programs #10: The City shall report annually on compliance with the Measure J Growth Management Program.

- **Capital Facilities Performance Standards** – Implementing Policies and Programs: #1 Development plans shall be reviewed for conformance with performance standards of this Element. #3 All development shall pay its fair share for facilities and system improvements created by the demand of the project.

## CIRCULATION ELEMENT (ADOPTED 2018)

The Circulation Element aims to enhance the mobility and safety of all transportation modes. State law requires consistency between each element of the General Plan, including the Circulation and Safety Elements. The Circulation Element recognizes that the City follows adopted emergency operation procedures and makes determinations for responses on a case-by-case basis. In the event that evacuation would be required, the city is served by major state highways, and there are five routes out of town: San Pablo Avenue (north and south), I-80 (north and south), and State Route 4 (east). Primary and second secondary evacuation routes are provided in Figure 3-15 of the Circulation Element.

The challenges for emergency access are limited routes into and out of Hercules and many of them pass through single intersections, such as San Pablo Avenue and Sycamore Avenue. If these roads or intersections are closed or badly congested during an emergency, emergency access progress can be lost. Almost all the evacuation routes are dependent on structures including bridges, railroad under-crossings, and freeway structures and would be vulnerable to closures in case of structural failure.

Similarly, many residential developments have only one collector road linking homes to San Pablo Avenue or Willow Avenue. If roads are blocked during an emergency, access or egress for these residents will be significantly restricted.

SR-4 and San Pablo Avenue pass within proximity of several oil and gas refineries, which might themselves be the cause of evacuation. Under such conditions, these routes might also become impassable.

If the ferry service is added to the Regional Intermodal Transportation Center, this will provide a secondary egress point for Hercules, taking advantage of the City's proximity to San Pablo Bay for water-borne evacuation for non-water-based emergency events.

Several policies and implementing actions in the Circulation Element are relevant to public safety:

- **Policy 1.A.** Transportation Performance Standards, maintenance of the operational multimodal transportation service objectives for Routes of Regional Significance can reduce average delay and reduce conflict when emergency access is required.

- **Implementation Action 1.A.1.** Require transportation studies for any project generating 100 or more new peak hour vehicle trips to identify impact to the City's circulation system and the Regional Routes of Significance and maintain the applicable multimodal transportation service objectives.

- **Implementation Action 1.B.2.** The City will update its Transportation Impact Fee so that all new development shall pay its fair share of new development on the City's circulation system.

- **Policy 1.C.** Promote a comprehensive system of interconnected pedestrian and bicycle trails throughout the City.

- **Implementation Action 1.C.4a.** Bicycle/Pedestrian linkage to schools, parks, and trails.

- **Implementation Action 1.C.4b.** Bicycle and pedestrian linkage to key destinations, including Hercules Transit Center and Regional Intermodal Transportation Center.

- **Policy 1.E.** Emergency Fire District vehicles have specific design requirements in terms of street width, the bearing capacity of the street, curve radii at corners, and access requirements. Projects and related circulation improvements shall be designed to provide appropriate access for all emergency response vehicles.

- **Action 1.E.1**. Coordinate with Emergency Service Providers. The City will continue to work closely with all emergency service providers to ensure both new and existing developments in Hercules are accessible so they can be effectively served by those providers.

- **Action 1.E.4.** Evacuation Routes. The city will maintain, and update as needed, emergency operational procedures, including the identification of safe zones and evacuation routes to be used in the event of earthquake, flooding, or another emergency event. Evacuation routes are shown in the Circulation Element Figure 3-15.

- **Action 1.E.5** The City will implement emergency vehicle signal preemption capabilities at any new or updated signalized intersections and at any existing signalized intersections as deemed necessary by the City Engineer.

- **Policy 5.A.** Major employers shall be encouraged to address greenhouse gas emission reduction using transportation demand management programs.

# RELATIONSHIP TO OTHER CITY PLANS

### REFUGIO CREEK WATERSHED VISION PLAN

In 2010 the City Council adopted Resolution 10-022 establishing the "Refugio Creek Watershed Vision Plan" as guiding policy for the Refugio Creek Watershed within the City of Hercules. The Plan identifies existing trails, informal trails, and proposed trails which have been incorporated into the Pedestrian Facilities Map of this Circulation Element.

### CITY OF HERCULES EMERGENCY OPERATIONS PLAN (2014)

The Emergency Operations Plan addresses the City of Hercules's planned response to emergency situations associated with natural, technological, radiological, or other emergencies. The Emergency Operations Plan establishes a Recovery Planning Unit to address post-disaster recovery.

### CITY OF HERCULES THREAT ASSESSMENT / EMERGENCY ACTION PLAN (2008)

The City of Hercules Emergency Operations Plan includes plausible emergencies and an accompanied emergency action plan for that situation. Hercules Municipal Code Title 3, Chapter 1, Emergency Operations Plan. The purpose is to provide for the preparation and carrying out of plans for the protection of persons and property within this City in the event of an emergency, the direction of the emergency organization, and the coordination of the emergency functions of the city with other public agencies, corporations, organizations, and affected private persons. The summaries are an integral part of the EOC Manual. Topics include aircraft collision; hazardous materials spill; major earthquake; flooding;

dam failure; landslide; wildfire; civil unrest; train derailment; active shooter; national security nuclear emergency; ferry/rail terminal (future placeholder). Each scenario includes an incident description, roles and responsibilities of each city department, and contact information for outside agencies involved. This Action Plan could do with being updated, along with annual scenario drills.

### CITY OF HERCULES LOCAL HAZARD MITIGATION PLAN (2020)

In conjunction with the update to the Safety Element, the City of Hercules authored a Local Hazard Mitigation Plan. The purpose of the plan is hazard identification, risk assessment, and mitigation strategies for protecting people, property and the environment in the City of Hercules. The Plan focused on four hazards that could have the greatest impact on the city. The hazard ranking process involves an assessment of the likelihood of occurrence for each hazard, along with its potential impacts on people, property, and the economy. Hercules aligned their Goals and Objectives with Contra Costa County's Multi-Jurisdictional Hazard Mitigation Plan for consistency. The plan complies with federal and state hazard mitigation planning requirements to establish eligibility for funding under the Disaster Mitigation Act of 2000 and fulfills requirements for climate change adaptation and resilience under Gov. Code 65302(g)(4).

### WATERFRONT DISTRICT MASTER PLAN (2012)

The Waterfront District is a 167-acre waterfront planned community including historic building restoration, historic town center, mixed-use (residential-commercial) development, multi-modal transportation center (rail, ferry, and bus), and park lands. The Plan restores, protects, and enhances Refugio Creek running through the Master Plan area and exiting to San Pablo Bay. The existing state waterfront walking trail and park is a sea-level rise buffer. The Plan commits to cooperation with the East Bay Regional Park District and the State of California to maintain the San Pablo Bay Trail and San Pablo Bay Regional Park as an attractive natural open space, as shown in the Conceptual District Master Plan.

### CITY OF HERCULES CLIMATE ACTION PLAN

The City of Hercules does not currently have a Climate Action Plan. Staff is aware that the likely greatest contributor to local greenhouse gases is the transportation sector, with I-80 and San Pablo Avenue running through the City. The City is also aware of the connection of various programs (such as recycling and creek improvements) that address climate change and resiliency. The City of Hercules does take advantage of region-wide or state-wide adaptation plans to augment local spending for efforts such as shoring up waterfront rail lines potentially affected by future sea-level rise. There is an opportunity for the City to conduct a municipal climate action plan to adjust operations to reduce city contribution to greenhouse gases.

## RELATIONSHIP TO OTHER PLANS

### COUNTY OF CONTRA COSTA CLIMATE ACTION PLAN (2015)

Contra Costa County is in the midst of Envision Contra Costa 2040, an update to the County Climate Action Plan, General Plan, Zoning Code, and Environmental Review. The Current Plan was adopted in December 2015 and is the County's strategic approach to reduce greenhouse gas emissions (GHG) from sources throughout the unincorporated area. The Climate Action Plan (CAP) demonstrates Contra Costa County's (County) commitment to addressing the challenges of climate change by reducing local GHG emissions while improving community health. The plan identifies how the unincorporated areas of the County will achieve the State's adopted reduction targets for 2030 and 2050, reducing

GHG emissions 40 percent below 1990 levels by 2030, with consideration of the State's long-term goal to reduce GHG emissions to 80 percent below 1990 levels by 2050. While the County Climate Action Plan does not cover the City of Hercules, it gives a comprehensive overview of the GHG emissions and climate challenges of the area.

### SAN FRANCISCO BAY PLAN

The shoreline area of Hercules is subject to the policies and regulations of the Bay Conservation and Development Commission (BCDC), as set forth in the San Francisco Bay Plan. The purpose of BCDC and the Bay Plan is to protect and preserve the San Francisco Bay and its shoreline as a valuable natural resource. BCDC jurisdiction includes the land 100 feet shoreward from the line of highest tidal action and specified tributary creeks. The sea-level rise in the Bay Area by 2030 is likely 6" to 10" and by 2050 13" to 23". It is expected that regional transportation systems will be disrupted by sea-level rise, including the railway track along the City of Hercules San Pablo Bay waterfront. In addition, the mud flats will be converted with sea-level rise to marshland, changing their value and utility.

### ADAPTING TO RISING TIDES: CONTRA COSTA COUNTY ASSESSMENT AND ADAPTATION PROJECT (MARCH 2017)

In 2010, the San Francisco Bay Conservation and Development Commission (BCDC) and NOAA's Office for Coastal Management (NOAA OCM) brought together local, regional, state, and federal agencies and organizations, as well as non-profit and private associations for a collaborative planning project along the Alameda County shoreline – the ART Subregional Project – to identify how current and future flooding will affect communities, infrastructure, ecosystems, and economy. In subsequent years the ART Program conducted a climate adaptation planning effort in Contra Costa County, focusing on the risks to the county from current and future flooding, while also considering the other challenges and opportunities facing the county.

### PLAN BAY AREA (2019)

Plan Bay Area 2040 is a state-mandated, integrated long-range transportation and land use plan. As required by Senate Bill 375, all metropolitan regions in California must complete a Sustainable Communities Strategy (SCS) as part of a Regional Transportation Plan. In the Bay Area, the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) are jointly responsible for developing and adopting an SCS that integrates transportation, land use, and housing to meet greenhouse gas reduction targets set by the California Air Resources Board (CARB). Plan Bay Area 2040's per-capita expected $CO_2$ emissions reductions will meet the Senate Bill 375 target for year 2035.

### ASSOCIATION OF BAY AREA GOVERNMENTS - RESILIENCE PROGRAM

The Association of Bay Area Governments (ABAG) is the regional planning agency for the nine counties and 101 cities and towns of the San Francisco Bay region. ABAG's planning and service programs work to address regional economic, social, and environmental challenges. The Resilience Program seeks to promote a more sustainable, resilient, and prosperous region where communities can withstand and quickly recover from the effects of earthquakes and natural hazards. The objectives of ABAG's Resilience Program include the following:

- Work to develop a regional land use pattern that reduces the risk of natural hazards.
- Provide a platform for local governments to come together to jointly plan, share best practices, and develop a shared understanding of regional needs for an effective recovery.

- Disseminate scientific information about natural hazards in an understandable and usable way that facilitates good policy and planning decisions.
- Provide tools for local governments to develop and implement mitigation and recovery plans.

### CONTRA COSTA COUNTY COMMUNITY WILDFIRE PROTECTION PLAN (2019)

The Diablo Fire Safe Council, in conjunction with Contra Coast County Fire Chiefs Association, Hills Emergency Forum, and Stakeholder Committee Members, prepared an update to the previous Community Wildfire Protection Plan (CWPP) from 2009. The CWPP provides analysis of wildfire hazards and risks in the wildland-urban interface (WUI) in Contra Costa County. The plan follows the standards for CWPPs established by the federal Healthy Forests Restoration Act. Based on the analysis, recommendations have been identified in reducing the threat of wildfire. The goal of the CWPP is to reduce hazard through increased information and education about wildfire, hazardous fuels reduction, actions to reduce structure ignitability, and other recommendations to assist emergency preparedness and fire suppression efforts. Most importantly it facilitates a coordinated effort between the various stakeholders.

Section 2.

# EXISTING CONDITIONS & HAZARDS

## GEOLOGY

Regional geology in the City of Hercules consists of alluvial (stream-related) deposits of Quaternary age (less than two million years old) on the floor of the Refugio Valley, surrounded by marine sedimentary rocks of Miocene age (between five and 23 million years old) in the adjacent uplands. The bedrock units exposed on the hills above the valley floor consist of Rodeo Shale and Hambre Sandstone to the south, and Briones Sandstone and Cierbo Sandstone to the north. In many places, the bedrock is overlain by colluvium (loose soil and rock fragments that have moved downslope).

Alluvium in the Refugio Valley varies from about 12 feet in thickness in the southeast portion of the valley to about 80 feet in thickness near the valley floor. Near San Pablo Bay, a few feet of fine-grained flood plain alluvium cap weak and highly compressible bay mud deposits. The bay mud has an estimated thickness of 35 to 40 feet along the western edge of the valley, thinning out in an upvalley direction.

Much of the older valley floor deposits are covered by loose, artificial fill. Fill materials were placed during operation of the Hercules Powder Company and consist of soils and bedrock excavated from adjacent hillside areas; in some places the fill includes rubble consisting of bricks, asphalt, concrete, glass, and wood.

Much of Hercules lies within the lower portion of the Refugio Valley, adjacent to San Pablo Bay. The valley floor is fairly level. Most slopes on the uplands surrounding the valley floor are gentle (less than 15 percent), although some slopes are between 15 and 30 percent, and exceed 30 percent in very limited areas. Landslides and soil creep have occurred in the past in the steeper portions of areas with unstable soils.

Clear Lake Clay lies on top of the alluvial deposits on the valley floor. The clay is a poorly drained soil with low erosion potential, low strength, high shrink-swell potential, and high corrosivity. Soils in the upland areas primarily consist of Tierra Loam, a moderately-well drained soil with moderate to high erosion potential, low strength, high shrink-swell potential, and high corrosivity. Other soils in the upland areas consist of Los Osos Clay Loam and Sehorn Clay, both of which are well-drained soils with moderate to high erosion potential, low strength, high shrink swell potential, and high corrosivity.

## SEISMIC HAZARDS

Based on history, all the San Francisco Bay Area is considered seismically active. There is no method by which the location, magnitude, or time of future seismic occurrences can be predicted. However, it is possible to identify certain types of seismic hazards and foretell which areas of the City will be particularly subject to damage by earthquakes. The following discussion summarizes the potential damaging effects of earthquakes in the City including ground shaking, ground failure, surface ruptures, and tsunamis. At the September 2019 public workshop, the attendees identified structural integrity of bridges (e.g., San Pablo & Hercules Avenues), railroad overcrossings, and some roadways as a concern. A community-wide survey taken in Oct. 2019–Jan. 2020 confirmed earthquakes as the primary concern of respondents.

### FAULTS

The Hercules area, as part of the San Francisco Bay Area, is in one of the most seismically active regions in the United States. The study area could be affected by ground shaking due to movement along any one of several active faults in the region. The San Andreas Fault lies about 21 miles to the southwest of the City, the Hayward Fault lies about two and a half miles southwest of the city, and the Concord-Green Valley Fault lies about 11 miles to the east. The Calaveras Fault lies approximately 40 miles to the southeast. The Rodgers Creek Fault, which connects with the Hayward Fault beneath San Pablo Bay, is another major fault only about 10 miles away to the west. The area within Hercules would be subject to strong ground motion in the event of a moderate to severe earthquake in the Bay Area. The U.S. Geological Survey has estimated that there is a 72 percent probability of one or more earthquakes of magnitude 6.7 or greater (comparable to the 1989 Loma Prieta earthquake of magnitude 6.9) in the San Francisco Bay Area between 2014-2043., with the Hayward Fault having the highest probability of 33%. Ground shaking, rather than surface fault rupture, is the cause of most damage during earthquakes.

In addition to the active faults noted above, two inactive faults are in the Hercules vicinity. Two traces of the Pinole Fault pass immediately southwest of Hercules, and the Franklin Fault lies about three miles to the northeast. Neither of these two faults shows evidence of surface displacement in Quaternary time (the last two million years), and future movement along them is much more unlikely than along the active faults associated with the Pinole fault.

The Alquist-Priolo Special Studies Zones Act requires the state to identify zones around “active” faults (those having evidence of surface displacement within about the last 11,000 years) in order to manage development near possible surface rupture sites. There are no Special Studies Zones within Hercules (the closest Special Studies Zone is along the Hayward Fault, about two and one half to four miles to the southwest). The northern end of the Pinole Fault was originally included in a Special Studies Zone but was removed from the active category after further analysis.

## EARTHQUAKE HAZARDS

There are four major hazards associated with earthquakes: fault surface rupture; ground shaking; ground failure; and flooding due to earthquake-generated waves or dam failures.

**Fault Surface Rupture.** In major earthquakes, fault displacement can cause rupture along the surface trace of the fault, leading to severe damage to any structures or other improvements located on the fault trace.

**Ground Shaking.** Because it affects a much broader area, ground shaking, rather than fault surface rupture, is the cause of most damage during earthquakes. Three major factors affect the severity (intensity) of ground shaking at a site during an earthquake: the size (magnitude) of the earthquake, the distance to the fault that generated the earthquake, and the geologic materials that underlie the site. Larger magnitude earthquakes cause the ground to shake harder and longer and affect larger areas. Given similar subsurface conditions, the intensity of ground shaking decreases with distance from the causative fault. Thick, loose soils, such as uncompacted alluvium and artificial fill, tend to amplify and prolong the ground shaking, while bedrock is less susceptible to ground shaking.

The Association of Bay Area Governments (ABAG) which uses the United States Geological Survey 2006 data has mapped portions of the City area’s susceptibility to ground shaking as “Sever shacking MMI 8” (the second highest rating) . These areas generally coincide with the bay mud underlying a portion of the valley floor and the bay front .

The bay muds are generally located along the bay shore with extending inland from the bay at the mouths of creeks. The risk of ground shaking damage in the areas underlain by bay mud is rated as "extremely high" (6.1 percent expected damage and above) for tilt-up concrete buildings, "high" (4.1–5.0 percent damage) for concrete and steel buildings, and "moderate" (2.1–3.0 percent damage) to "moderately high" (3–4 percent damage) for wood frame dwellings (ABAG, 1987). The risk of ground shaking damage is much lower for areas not underlain by bay mud, although areas underlain largely by alluvium are expected to endure strong ground shaking as well. (Figure 6.)

**Ground Failure.** Earthquakes can cause secondary ground failures, such as landslides, liquefaction, lurch, and settlement. All of these involve a displacement of the ground surface due to loss of strength, failure, or compaction of the underlying materials due to ground shaking. An earthquake could trigger landslides, particularly upon steeper slopes where slide activity has already occurred. The amount of sliding would be intensified if an earthquake were to occur during wet winter months when the slopes were in a saturated, weakened condition.

**Liquefaction** is the sudden loss of strength in loose, saturated materials (predominantly sands) during an earthquake, which results in the temporary fluid-like behavior of those materials (much like quicksand). Liquefaction typically occurs in areas where groundwater is shallow, and materials consist of clean, poorly consolidated, fine sands. There are areas in the City of Hercules of low to moderate susceptibility of liquefaction, although the potential is not known. The upland areas surrounding the valley floor are underlain by bedrock and would not be subject to liquefaction. Bay mud underlying the western portion of the valley floor is not likely to liquefy, although sand seams occasionally contained within the bay mud or fine-grained alluvium or artificial fill on top of the bay mud could be susceptible to liquefaction. The liquefaction potential in the area of the rest of the valley floor generally is not known, although there is no indication that materials susceptible to liquefaction are present (Figure 7).

**Lurch, or lurch cracking,** is the cracking of the ground surface in soft, saturated material as a result of earthquake-induced ground shaking. Lurching and cyclic softening in clay and bay mud are likely to occur. Lurch cracking is likely to occur in areas of bay mud and fill in moderate to large earthquakes. Lurch cracking can occur in water-saturated sediments, soils, and alluvium at distances of up to 75 miles from the earthquake epicenter. The probability of lurching in the valley floor areas is unknown, but its occurrence is possible.

Differential settlement (where adjoining areas settle different amounts) most commonly occurs in loose, uncompacted materials of variable density and strength. Artificial fills are likely to be most susceptible to differential settlement. Transition areas between bedrock and alluvial deposits would also be subject to differential settlement.

**Flooding.** Seismic activity off the coast of California could induce a tsunami that could enter San Francisco Bay through the Golden Gate. Tsunamis are waves that increase in size with distance traveled and can cause destruction when they pile up at shallow shoreline areas. According to National Oceanic and Atmospheric Administration, the last tsunamis were in 2012 from Canada and took 4 hours to arrive in Richmond; and Japan in 2011 and took 11 hours to arrive. According to the State of California Geological Survey Tsunami Inundation Map for Mare Island Quadrangle (2009), there are tsunami inundation areas in the City of Hercules (Figure 8). The Waterfront build-out plans, the new ferry plans, train railway improvements, waterfront park, and Refugio Creek improvement plans should recognize and reflect the tsunami inundation line.

A major earthquake could theoretically create a seiche, a type of oscillating wave that sloshes around in an enclosed basin and can cause severe damage at the shoreline. However, no such wave has ever been recorded in San Francisco Bay or San Pablo Bay within historic time. A large earthquake could induce a landslide adjacent to a nearby reservoir, creating the geologic hazard known as landslide splash, an overtopping of water resulting from earth sliding into the reservoir. Additionally, failure of reservoir dams themselves could directly result from a major earthquake. The closest dam to the City of Hercules is the San Pablo Dam. The San Pablo Reservoir is owned by East Bay Municipal Utility District, and located north of Orinda and south of Richmond, California. The San Pablo Dam, built in 1919, is located at the end of the reservoir with a total capacity of 38,600 acre-feet, and a watershed of 23.37 square miles. While the City of Hercules does not lie in the path of inundation from San Pablo Dam there is a portion in the south west edge of the city including about 30 parcels that is in the inundation zone of Maloney Reservoir located in the City of Pinole (Figure 9).

*Figure 6. Earthquake Shaking Hazard Map*

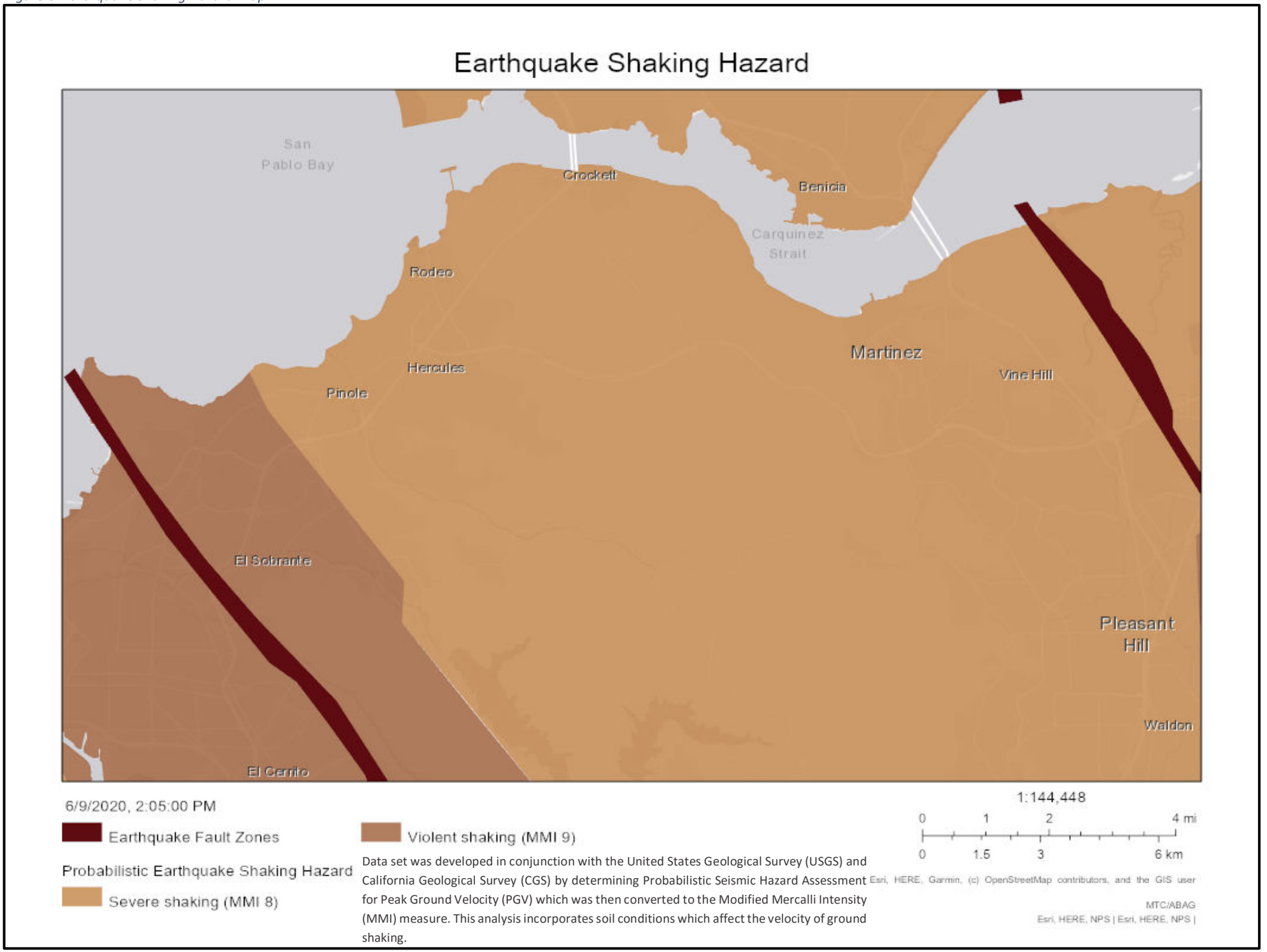


*Figure 7. Earthquake Liquefaction Hazard Map*

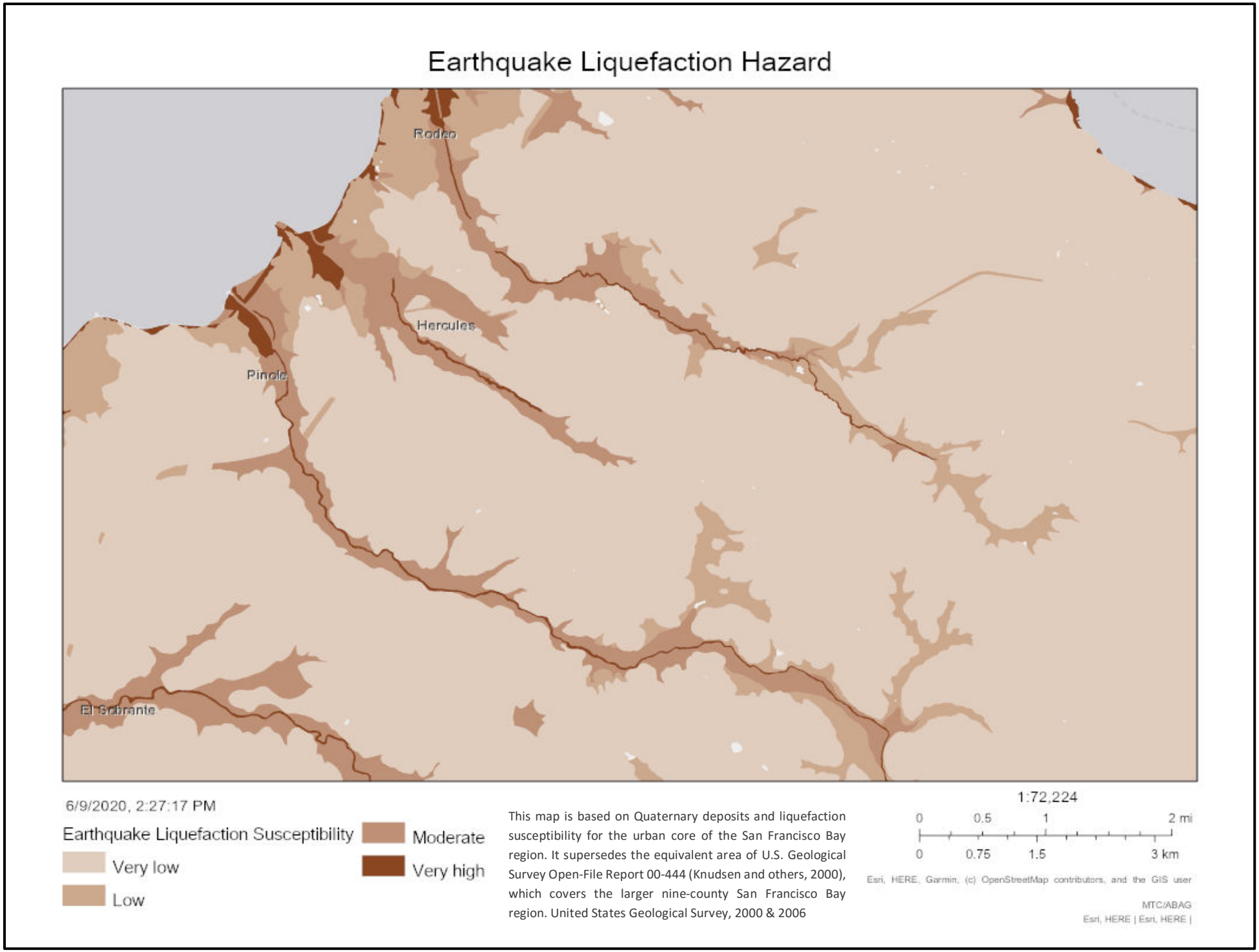


*Figure 8. Tsunami Evacuation Zones*

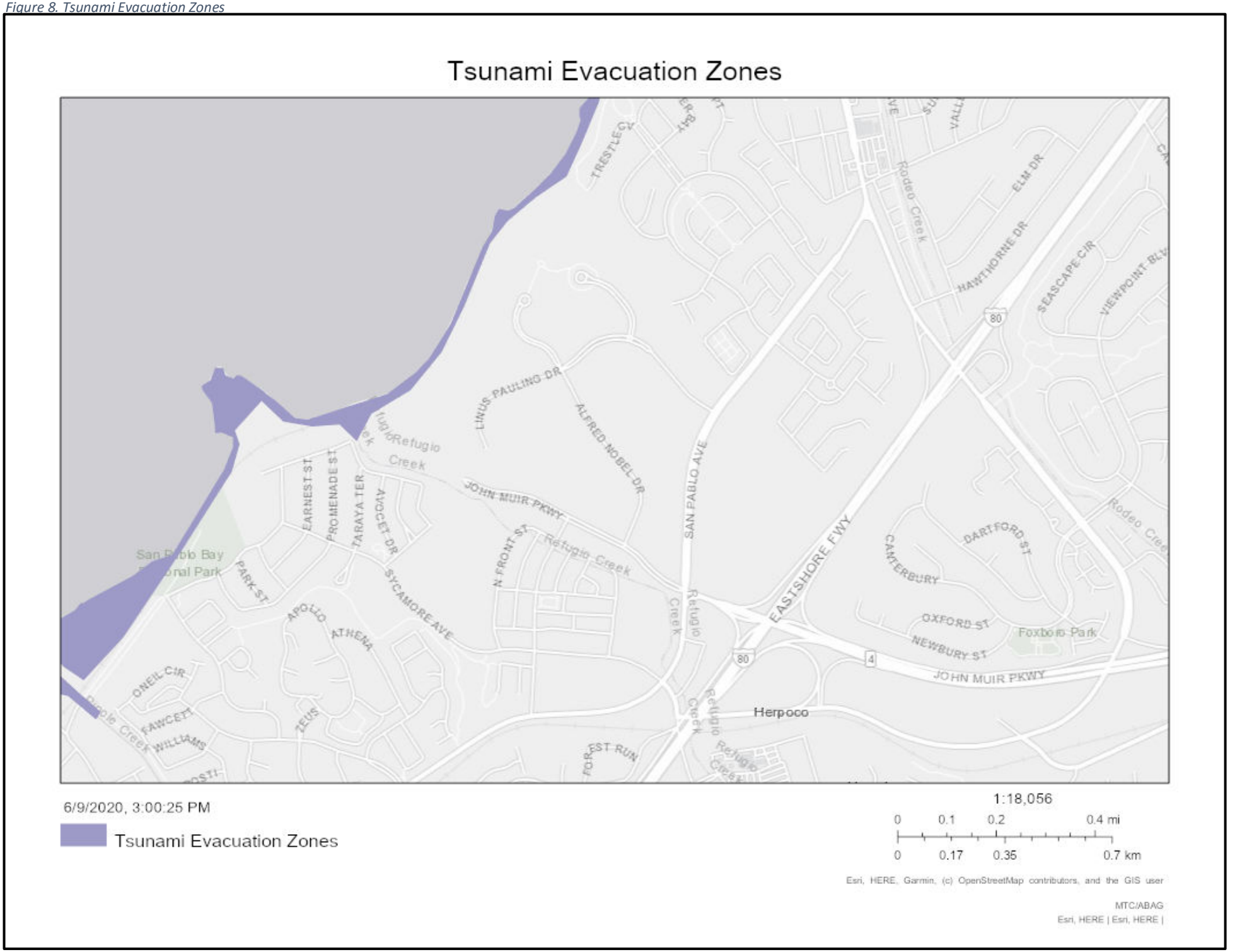


*Figure 9. Dam Inundation Flood Zones*

# GEOLOGICAL HAZARDS

Potential geological hazards in the City include:

- Landslides and soil creep
- Valley alluvium
- Existing fills
- Ground water, seepage, and ponding
- Erosion

### Landslides and Soil Creep

Numerous shallow landslides of various sizes are present in Hercules, particularly in the southeastern part of the City (Figure 10). As recently as 2000 and 2006, landslides occurred and several homes were lost following heavy rains. The City adopted a Grading Ordinance establishing standards for grading operations, requiring the issuance of grading permits, providing for the approval of grading plans, and inspection of grading construction. The Grading Ordinance provides for testing where there are potential geologic hazards.

In addition to the landslides, soil creep movements are occurring on certain slopes within the City. Creep movement is generally most active and widespread on the steeper slopes. Rates and depths of creep movement are much slower and shallower than those associated with active landslides.

### Valley Alluvium

The depth of alluvium in Refugio Valley varies from 11.5 feet in the southeast portion of the valley to about 80 feet near the valley mouth. Most of the upper valley is blanketed with an expansive, adobe-type soil. The adobe-like topsoil is generally underlain to the bedrock formation with firm to still alluvial soils. However, in some locations, compressible freshwater marsh deposits are present, which become thicker and closer to the ground surface in the lower portions of Refugio Valley. Near the mouth of Refugio Valley, in the vicinity of the site of the former Hercules Incorporated Dynamite Plant, very weak and compressible younger bay muds are present. The depth of the younger bay muds near the valley mouth ranges from about 45 feet to about 70 feet. Older bay muds and/or residential soils of variable depths underlie the younger bay muds.

### Existing Fills

Overlying the valley alluvium and some overburden soil deposits are several generally small and shallow embankment fills. Most of these fills are in Refugio Valley and vary in depth from a few feet up to ten feet. One large fill, in the Lower Refugio Valley, consists of approximately 100,000 cubic yards and averages about four feet in depth.

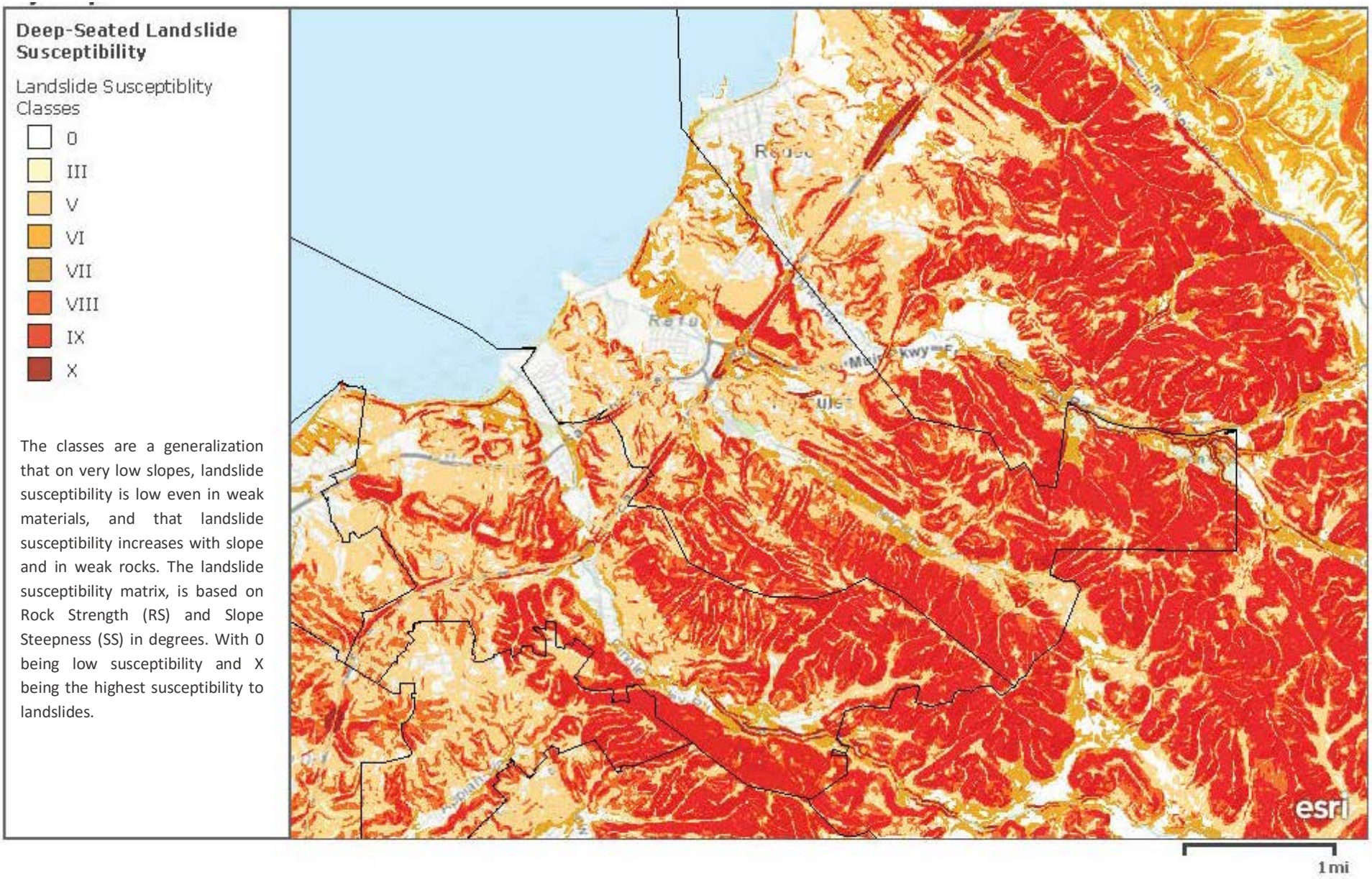
### Ground Water, Seepage and Ponding

A generally shallow, thin zone of ground water will be encountered in most of Refugio Valley at depths ranging between three and five feet. Somewhat deeper ground water levels exist in the upper portions of the valley. Shallow ground water levels are also expected adjacent to Pinole and Rodeo Creeks. Several small springs and areas of surface seepage are present in the City, usually located in the foot or toe areas of landslides or at the base of sharp breaks in slope. During the wet winter months, numerous, generally small areas of water ponding are observed throughout the confines of Refugio Valley. Most ponds were the result of site grading for plant facilities over the years.

### Erosion

Unprotected soils and highly weathered bedrock will be subject to erosion. Protective measures are especially needed for construction on highly erosive soils (Tierra Loam, Los Osos Clay Loam, and Sehon Clay).

*Figure 10. Landslide Susceptibility*



# FIRE HAZARDS

Fire is an integral part of the California landscape. The Mediterranean climate with cold/wet winters and warm/dry summers, productive plant communities, and rugged terrain contribute to one of the most fire-prone and fire-adapted landscapes in the world. The unique combination of weather, fuel, and topography in California combine to produce extreme wildfire behavior. The influences of climate change such as longer periods of drought and hotter and longer fall and extreme weather have increased the occurrences of wildfire.

The California Department of Forestry and Fire Protection's (CAL FIRE) role is to prevent wildfires in the State Responsibility Area (SRA). The Department's Fire Prevention Program consists of multiple activities, including wildland pre-fire engineering, vegetation management, fire planning, education, and law enforcement. Typical fire prevention projects include brush clearance, prescribed fire, defensible space inspections, emergency evacuation planning, fire prevention education, fire hazard severity mapping, and fire-related law enforcement activities. Updated draft CAL Fire maps are expected in late 2020. Governor Gavin Newsom issued Executive Order N-05-19 on January 9, 2019, after California experienced two of the deadliest and most destructive years of wildfires in 2017 and 2018. The Executive Order directs the California Department of Forestry and Fire Protection (CAL FIRE), in consultation with other state agencies and departments, to recommend immediate, medium, and long-term actions to help prevent destructive wildfires. As part of its recommendation, CAL FIRE identified 35 Priority Projects to reduce the chance and intensity of wildfires. Contra Costa County was identified for a fuel reduction project called the North Orinda Fuel Break that was completed in December 2019. Hercules is listed as one of the communities this project would protect from wildfire spreading.

The State Responsibility Area map in Figure 11 shows fire hazard severity zones. Land adjacent to the City limits and some land located within the City's Sphere of Influence are designated with a high fire hazard severity zone in the State Responsibility Area (SRA). No land within the incorporated areas of the City has been identified within Local or State Responsibility Areas for fire hazards.

The number and severity of wildfires in California are projected to increase in the coming years. The two largest fires in California history have happened over the last three years, with 16 of the top 20 most destructive fires having occurred between 1999 and 2019. Contra Costa County is made up of urban-wildland interface areas, including suburban populated areas bordered by hill terrain covered with vegetation.

Large portions of the City of Hercules have been designated as Wildland Urban Interface (WUI) areas Figure 13, where homesteads are adjacent to the county open space. The open space includes brush and grass covered hills and forested area, including non-native blue gum Eucalyptus trees which are particularly flammable. The City collaborates with the County and the Rodeo–Hercules Fire District to assist with annual maintenance of the open space and to educate the public about weed clearance around their structures to reduce these fire hazards.

The Rodeo Hercules Fire District was formed in 1937, as an independent special district. The District provides services to the City of Hercules, the community of Rodeo, and areas of Contra Costa County, as well as service to other areas and agencies through mutual aid responses. The District, governed by a Board of Directors maintains a variety of apparatus and equipment for responding to fire and emergencies in a wide range of environments, including major highways and streets, undeveloped wildland, urban and shore areas, developed urban and residential neighborhoods,

commercial and industrial areas, and refinery/industrial areas. The District also provides community, training, and education services, such as CPR Training. The Fire Districts annual report concludes the majority of calls are for rescues and emergency medical services, with the least amount of calls for hazardous materials, and second least for fires in residential, commercial, industrial, and WUI areas.

A community-wide survey conducted in December 2019 confirmed that next to earthquake, the second highest concern for the public was wildfire. According to the Rodeo–Hercules Fire District Wildland Fire Action Guide, homes within one mile of a natural area are considered part of an ember zone, where wind-driven embers can be a risk to property. Creating defensible space by removing weeds, brush, and other vegetation creates a buffer zone that reduces the risk from flying embers.

**FIRE SERVICE**

Fire protection services to the City of Hercules are provided by the Rodeo-Hercules Fire Protection District. The District provides 24-hour protection to the City of Hercules and the unincorporated areas of Rodeo. A 24-hour dispatch service is provided to the District under contract with the City of Pinole. The District has an automatic response agreement with the Pinole Fire Department.

The District has two fire stations: a four-bay station at 326 Third Street in Rodeo and a three-bay station at 1680 Refugio Valley Road in Hercules. District equipment includes: one 1500-gpm pumper, one 1,250-gpm pumper, two 1,000-gpm pumpers, two 500-gpm Wildland units, two 200-gpm Wildland units, one rescue truck, one utility truck, and four staff vehicles.

The District responds to all fire and rescue-related emergencies within the District's boundaries. The response time goal of the District is to reach an emergency scene in built-up areas of the District within five minutes 90 percent of the time. In 2020 to date, the District reported it had met this goal in all responses.

The District receives revenue from property taxes, fire impact fees levied on new development (developer fees), and benefit assessment fees levied pursuant to a District ordinance. Assessment fees are recurring annual fees collected according to a sliding scale based on risk factors according to the land use on the parcel. All parcels are assigned risk units based on the size and type of development; the number of risk units is multiplied by the unit fee to determine the assessment fee. The benefit assessment fees are used by the District for the purchase of new and replacement equipment and to support personnel costs.

Fire impact fees are levied on all new development within the District, both in the City of Hercules and in the unincorporated community of Rodeo. The total square footage of a project, whether industrial, commercial or residential, is multiplied by the fire impact fee rate to arrive at the total fee. Impact fees are used for the purpose of buying new and replacement capital equipment required to meet the demand that new development places on the District's fire suppression capabilities. Development fees may not be used to fund ongoing operations. The current fire parcel tax Measure O is not adequate to cover multi-family residential development demand because the fee is not based upon the actual number of units created, but the number of parcels created for a development. In this way, the financial support to build the planned, new fire station cannot be achieved to meet the build-out growth expected.

The District implements the 100-foot defensible space required by law. Defensible space around a home can dramatically increase the buildings chance to survive a fire. The weed abatement must be completed annually prior to the July 4th weekend. The City of Hercules Capital Improvement Program includes a robust citywide weed abatement program in public right-of-way. The area outside the city boundaries but within the city's sphere of influence, particularly in the WUI and abutting developed properties, requires continued ongoing weed abatement and clearing. The area abutting the WUI is built-out, and the land use designation is very low (Single-Family Estate) or low density (Single- or Multi-Family Low) residential. The District has a Wildland Fire Action Guide which includes information on how to make homes wildland-fire ready and fire resistant.

Peak load water supply requirements: The domestic water supply for Hercules is provided by the East Bay Municipal Utility District (EBMUD), which has several reservoirs within the Bay Area to serve its distribution network. In the event of an emergency, the District is dependent upon the EBMUD system to supply water. The District's standard for emergency water supply for firefighting is 1,000 gpm for residential uses and 1,500 gpm for commercial uses.

*Figure 11. Fire Hazard Severity Zones in SRA*

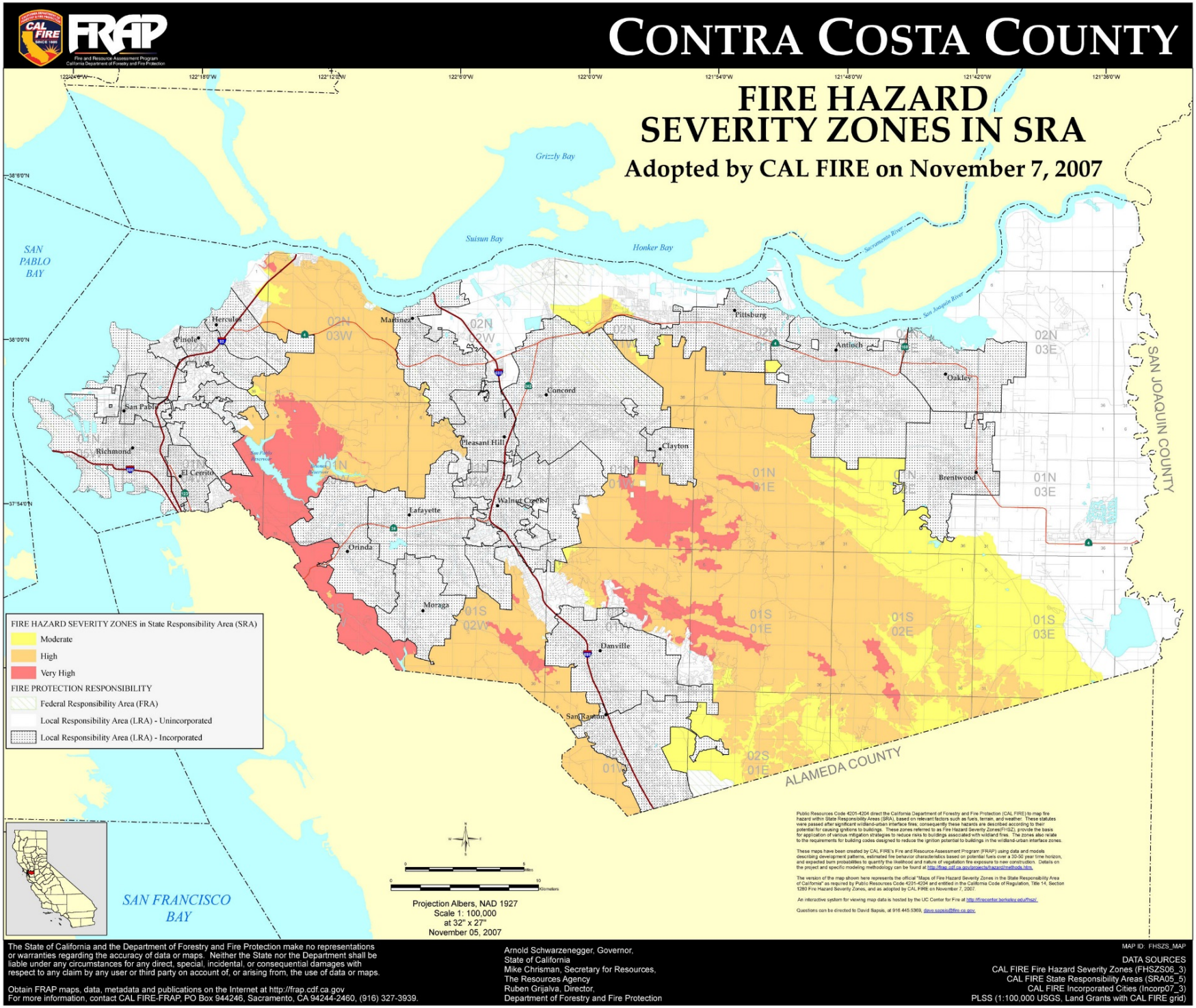


*Figure 12. Fire Hazard Severity Zones in LRA*

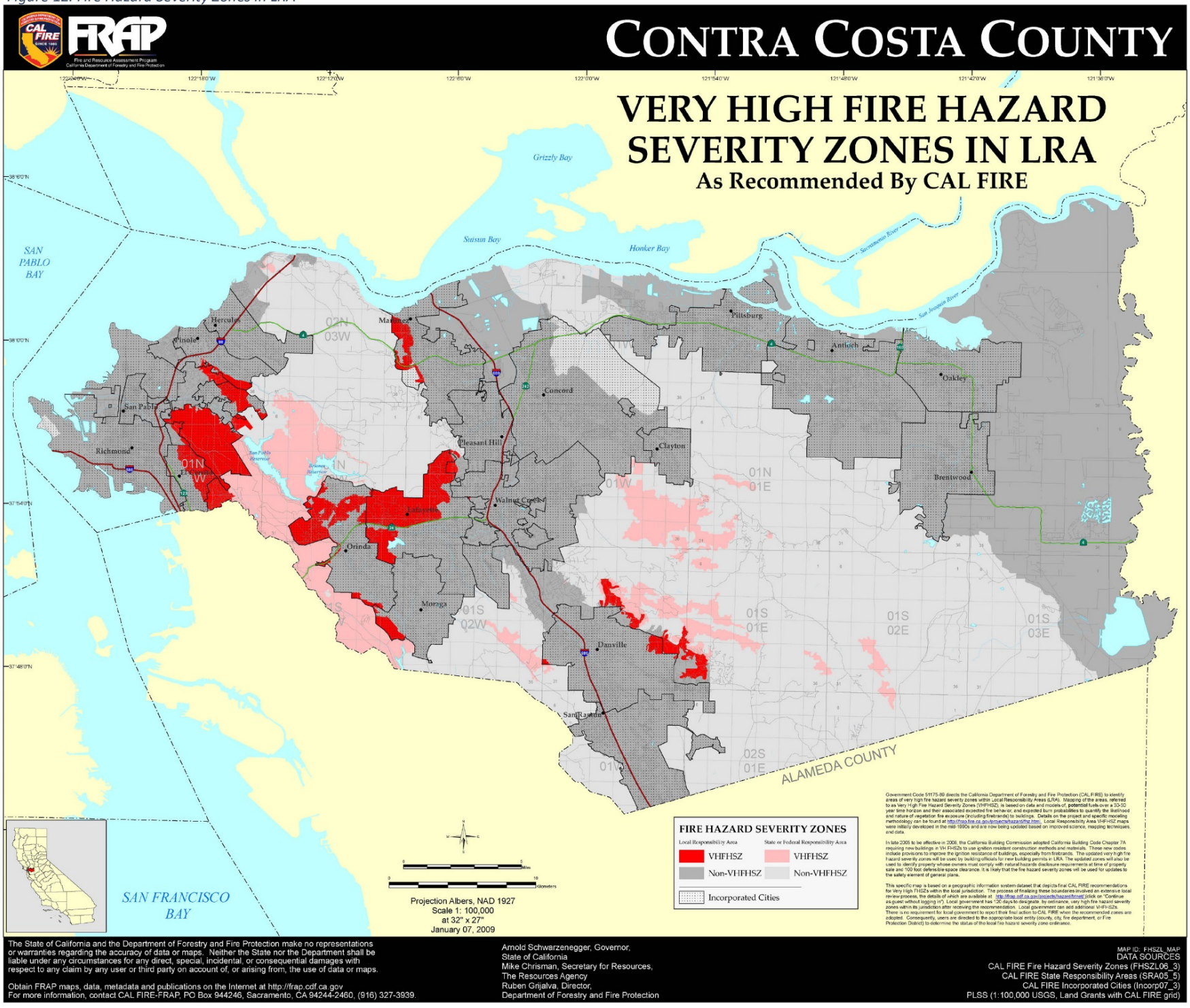
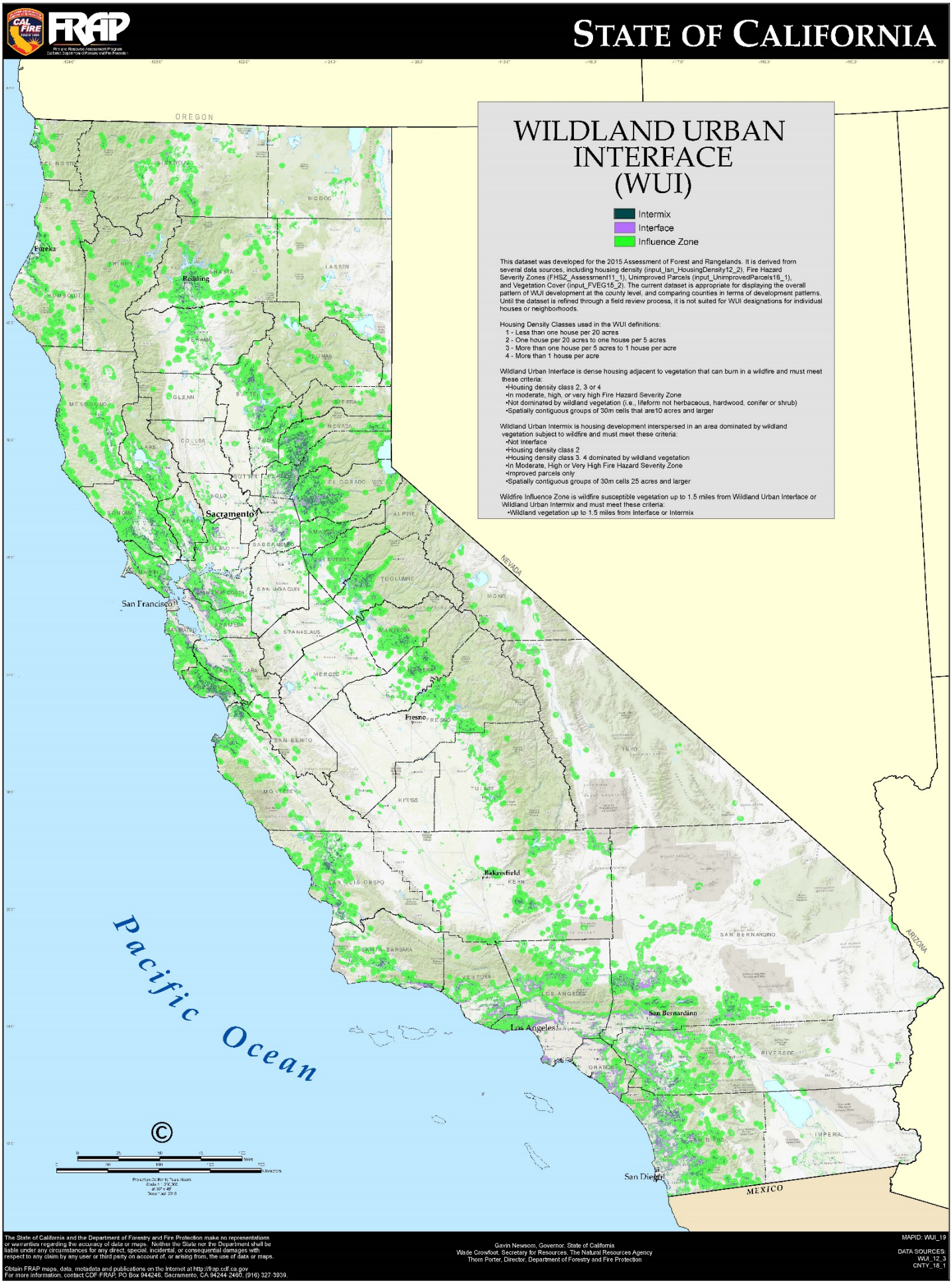


*Figure 13. Wildland Urban Interface*



# EVACUATION ROUTES

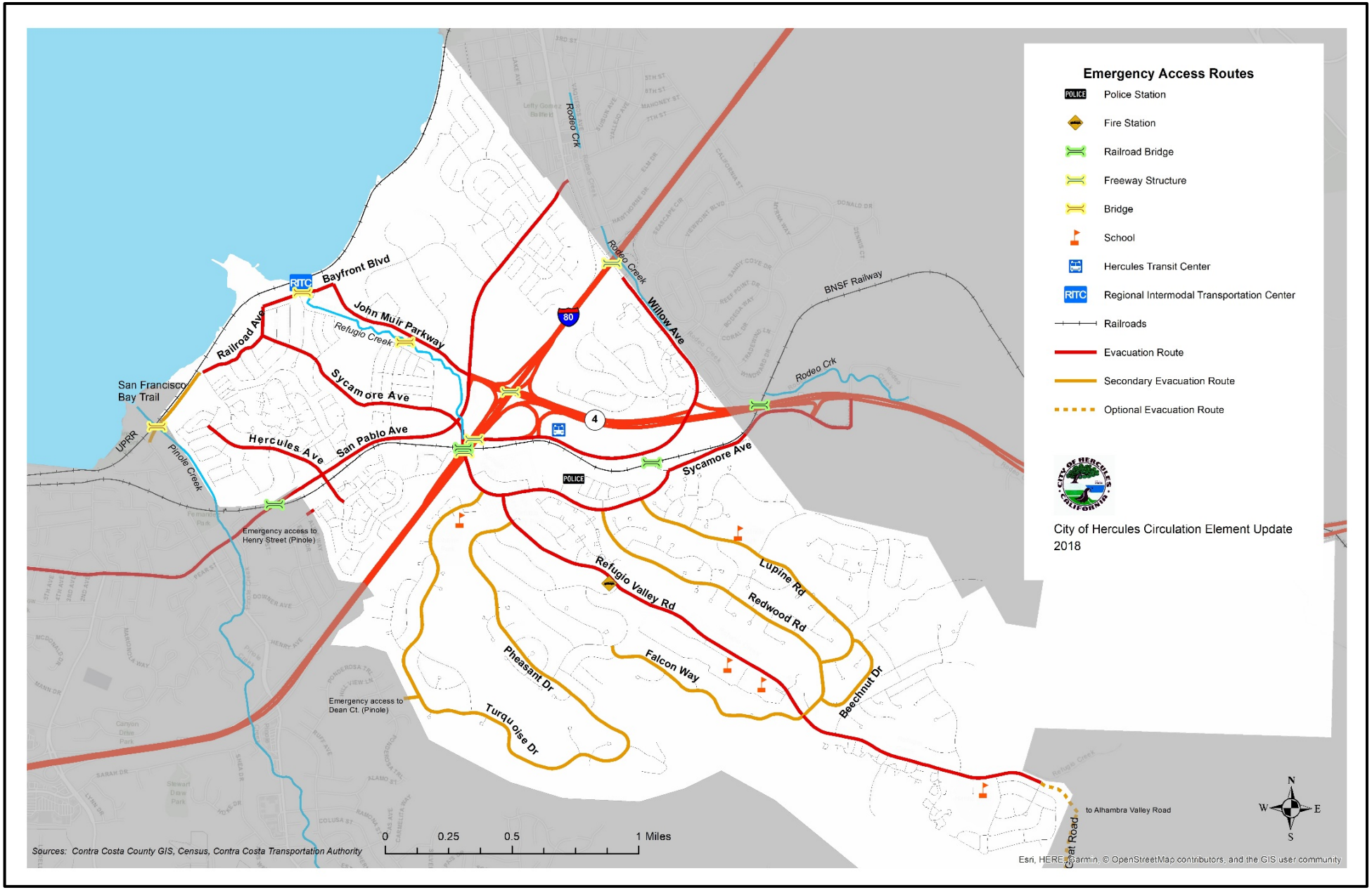
The Circulation Element provides a framework of arterials and local streets that will provide alternate routes to or from any portion of the City in case of emergency (Circulation Element of the General Plan page III-67). Long cul-de-sacs present safety problems because of the possibility of blockage preventing access of emergency equipment or evacuation of residents. The current maximum cul-de-sac length allowed by the Rodeo–Hercules Fire District is 450 feet.

A blockage of Interstate 80 within the City would have a major impact on the circulation system. The only alternate route for traffic would be San Pablo Avenue. Willow Avenue would be the alternate route in the case of a blockage on Highway 4.

The primary and secondary evacuation routes are listed in both the Circulation Element and the Emergency Operations Plan, as are emergency equipment routes and shelters (Figure 14 and Table 2). The primary emergency equipment and evacuation routes are San Pablo Avenue, Highway 4, Interstate-80, Sycamore Ave., Refugio Valley Road, Falcon Way, Turquoise Ave., and Pheasant Drive. The minimum emergency road width clearance to be maintained along the evacuation routes is 20 feet. The clearance widths exclude parking and other impediments to traffic flow. In the City of Pinole a pedestrian exit is the bridge across Pinole Creek, but the structural integrity is weak and considered structural deficient for vehicles.

Essential facilities in Hercules include a police and fire station, emergency operations center, evacuation shelters, and schools. These facilities are essential to the health and welfare of the whole population. Because the emergency operations center is in the police department, the City would benefit from a back-up emergency operation center location in case the police department were damaged during an emergency.

*Figure 14. Evacuation Routes*



Emergency Shelters Approved Red Cross emergency shelters are designated within the Community Center at 2001 Refugio Valley Road, Ohlone Community Center at 1616 Pheasant Drive, Lupine Hills Elementary School at 1919 Lupine Road, and Lupine Child Care Center at 1905 Lupine Road (Table 2).

The Police Department leads the emergency shelters at the following locations:

*Table 2. Emergency Shelter Locations*

| ZONE | SITE | ALTERNATIVE |
|---|---|---|
| **1** | Hercules Swim Center, 2001 Refugio Valley Rd. | Lupine Hills Elementary School, 1919 Lupine Rd |
| | | Hercules Middle/High School, 2000 Refugio Valley Rd |
| **2** | Hercules Swim Center, 2001 Refugio Valley Rd. | Hercules Middle/High School, 2000 Refugio Valley Rd |
| | | Ohlone Center located, 190 Turquoise Dr. (Small facility for staging) |
| | | Ohlone Elementary School, 1616 Pheasant Dr. |
| **3** | Hercules Swim Center, 2001 Refugio Valley Rd. | Hercules Middle/High School,2000 Refugio Valley Rd. |
| | | Hanna Ranch Elementary school, 2482 Refugio Valley Rd. |
| **4** | Hercules Senior Center, 111 Civic Dr. | Hercules Middle/High School,2000 Refugio Valley Rd. |
| | Hercules Swim Center, 2001 Refugio Valley Rd. | Ohlone Elementary School,1616 Pheasant Dr. |
| **5** | Hercules Senior Center, 111 Civic Dr. | Hercules Middle/High School, 2000 Refugio Valley Rd. |
| | Valley Bible Church, 1477 Willow Ave. (Tentative) | Hercules by the Bay Homeowners Association Club House, 3700 Santa Fe Ave. This is a small facility for staging, after remodel could be a shelter. |
| **6** | Hercules Senior Center,111 Civic Dr. | Hercules Middle/High School, 2000 Refugio Valley Rd. |
| | Valley Bible Church, 1477 Willow Ave. (Tentative) | Hercules Swim Center, 2001 Refugio Valley Rd. |
| **7** | Valley Bible Church, 1477 Willow Ave. (Tentative) | Hercules Middle/High School, 2000 Refugio Valley Rd. |
| | Hercules Senior Center, 111 Civic Dr. | Hercules Swim Center, 2001 Refugio Valley Rd. |
| | | Foxboro Community Center, 1025 Canterbury. (Small site for staging) |

# FLOOD HAZARDS

Potential causes of flooding in the City include:

- High tides, sea-level rise, and storm waves
- Creek overflows
- Standing water from excess rainfall

### HIGH TIDES, SEA-LEVEL RISE, AND STORM WAVES

High Tides: Tides are very long waves that move across the ocean; when the highest point in the wave, or the crest, reaches a coast, the coast experiences a high tide.

King Tide: A natural phenomenon that occurs near the Summer and Winter solstices which produce dramatic high tidal fluctuations. The King Tides combined with sea-level rise over time will create the highest possible impact on land.

Sea-Level Rise: Caused by two factors related to global warming: the added water from melting ice sheets and glaciers, and the expansion of seawater as it warms.

Storm Waves and Surge: High winds associated with storms can cause extreme waves and storm surges. Storm surges, caused by a combination of low barometric pressure and high onshore winds, can raise sea-level by several feet.

The City's northwest land area is adjacent to San Pablo Bay. Potential flood hazards associated with high tides and storm waves are concentrated at the confluence of the Bay and two creeks, Pinole Creek and Refugio Creek.

The Pinole Creek Watershed covers approximately 15 square miles, and includes portions of the cities of Pinole and Hercules as well as unincorporated areas in East Bay Municipal Utility District owned lands, and the Briones Agricultural Preserve. Pinole Creek is in Flood Control Zone 9, formed in 1950s and provides funding for construction and maintenance of regional drainage infrastructure in the watershed, but not enough revenue to dredge Pinole Creek. The Pinole Creek Watershed Vision Plan (2003-2004) included a sediment study to determine water quality, and a biology study that confirmed the lower Pinole Creek had the potential to support steelhead and rainbow trout passage if the I-80 culvert was remedied. The culvert work was completed. In 2010, the City of Pinole along with other partners constructed the Pinole Creek Demonstration Project to restore tidal marsh and riparian vegetation and reduce flood risk along approximately 1,000 feet of lower Pinole Creek. The railroad and Railroad Avenue bridges will continue to restrict flood flows through the lower Pinole Creek, especially with the siltation of the Creek. The project constructed sheet pile flood walls between UPRR bridge and approximately 1,800 feet upstream to address the channel filling with silt and vegetation. The floodwalls vary in height but average 3.5 feet. These flood walls provide flood protection up to 50 year but not the 100 years desired. If bridges, creek siltation and vegetation are removed in the future, greater flood protection shall be provided.

Pinole Creek, between San Pablo Avenue and the Bay, is a tidal waterway that was channelized and realigned by the U.S. Army Corps of Engineers in 1965. The Army Corps has regulatory jurisdiction for wetland delineations and activity that discharges or pollutes waters of the United States. The Pinole Creek Watershed Vision Plan was prepared in 2014

to document the vision for restoration of the creek to a more natural state. A portion of the Vision Plan was implemented, with the Pinole Creek Habitat Restoration demonstration project, located between the Pinole Creek mouth and Interstate-80. The City of Hercules also plans to restore the Chelsea Wetlands, adjacent to Pinole Creek comprised of five acres of degraded seasonal wetlands, into functioning tidal wetlands. These improvement projects are intended to both restore wetland aquatic and transitional habitat while preserving and expanding flood conveyance and water storage capacity. Lower Pinole Creek is maintained by the Flood Control District, which lacks the funding to perform the vegetation removal and dredging needed to establish a 100-year flood zone. FEMA maps have yet to be updated to reflect this current condition.

A large portion of Refugio Creek nearest San Pablo Bay (approximately 1,500 feet upstream of Bayfront Boulevard) has - been restored, significantly reducing susceptibility to flooding. As part of the work associated with construction of the Bayfront Bridge/Intermodal Transportation Center, the last stretch of Refugio Creek before entering San Pablo Bay will be realigned, and the creek channel into San Pablo Bay will be dredged to improve flow during heavy rain events and high tides. Until this work is completed, high tides and storm-driven waves occurring together could overtop embankments and flood low-lying coastal areas such as sections of the Bay Trail and the Union Pacific railroad tracks.

### City of Hercules Municipal Code

Title 10, Chapter 7, Flood Damage Protection Ordinance. The Flood Damage Prevention Ordinance applies to areas of special flood hazards, the roles and responsibility of the Floodplain Administrator, development permit requirements for construction within any special flood hazard area, and provisions for flood hazard reduction. Chapter 13-21, Special Flood Hazard Area Overlay District applies to lands within the Federal Emergency Management Agency 100-year flood plain, designates the area subject to the Flood Damage Prevention Ordinance, and provides guidelines in combining the regulations of the land use zoning district designated for the property.

The Special Flood Hazard Area Overlay District adds to the base zoning district regulations that apply to land within the 100-year flood plain delineated by the Flood Insurance Rate Map (FIRM), by FEMA. The regulations provide performance standards for development within the Refugio Creek Basin. The city participates and is in good standing with FEMA's National Flood Insurance Program (Figure 11 and Figure 12).

Adapting to Rising Tides: Contra Costa County Assessment and Adaptation Project (2017) used the most recent science-based sea-level rise projections for the West Coast of the United States (California, Oregon, and Washington) which were published by the National Research Council in 2012. The study emphasizes its adaptation and resiliency plan toward the National Research Council Sea-Level Rise for the Coasts of California, Oregon, and Washington study released June 2012. The NRC 2012 mean projections were 11" sea-level rise by 2050, and 36" by 2100.

State of California Sea-Level Rise Guidance 2018 Update was prepared by the California Ocean Protection Council (OPC) and peer-reviewed by some of the nation's foremost experts in coastal processes, climate and sea-level rise science, observational and modeling science, the science of extremes, and decision-making under uncertainty. The state guidance estimated the most likely scenario for sea-level rise at 13.2" by 2050 and 40" by 2100.

While the near-term sea-level rise through 2050 has been locked in by past greenhouse gas emissions and the slow response times of the ocean and land ice to warming, the long-lived nature of most greenhouse gases means that their impacts on the environment are felt and experienced long after being emitted. Comparatively, after 2050, sea-level rise projections increasingly depend on the pathway of future greenhouse gas emissions and are less predictable.

For the purposes of this document, the City of Hercules is planning for a sea-level rise of 12" by year 2050, with a 100-year storm resulting in a combined rise of 52". (Table 3 and Figure 15) show the sea-level rise for 2050 plus storm-induced sea-level rise through storm waves and surges.

*Table 3. 2050 Sea-level Rise + Storm Surge*

| | Likely Max. Rise |
|---|---|
| **State Guidance Sea-level Rise (High Emission)** | 13.2" |
| **ART Maps Equivalent Sea-level Rise** | 12" |
| **Sea-level Rise + 5 year Storm** | 36" |
| **Sea-level Rise + 50 Year Storm** | 48" |
| **Sea-level Rise + 100 Year Storm** | 52" |

A number of regional systems and individual city assets exist along the waterfront, including transportation [Union Pacific Railroad (UPRR) Amtrak rail, and local roads] and Priority Conservation Areas (PCAs) (San Francisco Bay Trail and San Francisco Water Trail). The UPRR is an important heavy freight rail supporting the reliable movement of goods to markets across the Bay Area. The segment between the Port of Oakland and Martinez is the busiest rail segment in Northern California. The overall freight rail demand is anticipated to grow. The rail connects many Bay Area ports and connects to areas outside the region. The rail runs the entire length of the shoreline and is exposed to flooding at 48" Total Water Level (TWL) near the mouth of Pinole Creek, with significant flooding impacts at 77" TWL at the mouth of Rodeo Creek. The rail serves as ad-hoc flood protection for numerous residential and businesses behind it. San Pablo Avenue, the main arterial through the City, is exposed to flooding at 52" TWL.

**Priority Development Area:** The Waterfront District PDA, located along the San Pablo Bay in the City of Hercules, is a 210-net acre area designed as a Transit Town Center. It is currently served by transit provided by the Western Contra Costa County Transit Authority (WestCAT) but will be home to the Hercules Regional Intermodal Transportation Center, which is being constructed in phases with the Bay Trail West Phase having been the most recently completed phases, with Utility Relocation and Rail Improvements to be the next phases. When completed, the Hercules station will be the first center to connect trans-bay ferry service, a Capital Corridor train stop, and bus service all in one place. The future housing and jobs in the Waterfront District PDA represent a 30% growth in residential housing up to 800; and job growth of 42% with an additional 48 jobs.

**Priority Conservation Areas (PCA):** The City of Hercules does not have a designated PCA. The San Francisco Bay Trail PCA is a 500-mile regional trail that upon completion will circumnavigate the bay. The trail connects people and communities to each other, to parks and open space, to home, work, and recreation, and to countless areas of cultural and historic interest. It provides opportunities for health and fitness. The Bay Trail runs adjacent to the Union Pacific Railroad in Hercules. Significant areas are exposed to flooding beginning near Pinole Creek at 24" TWL. The Pinole

Creek Watershed PCA covers a 15-square-mile watershed in portions of the cities of Pinole and Hercules, East Bay Municipal Utilities District Pinole Valley property, and Briones Agricultural Preserve. The Chelsea Wetlands is a 13-acre site at the mouth of the Pinole Creek, currently used as an overflow basin for the Pinole Creek and planned for restoration. The Pinole Creek Watershed PCA is exposed to flooding starting at 24" Total Water Level (TWL), due to overtopping of the shoreline near the mouth of Pinole Creek.

In summary, at 24" TWL there is overtopping (but not flooding), of an embankment in Pinole Creek. At 48" TWL, there is overtopping of the UPRR railroad tracks and embankments at Pinole Creek as water levels rise. At 96" TWL, overtopping (but not flooding) occurs at embankments in Refugio Creek. Between 96" and 108" TWL there is increased overtopping of Refugio Creek which inundates protected open space along the creek, but residential households adjacent to the open space remain protected.

Starting at 48" TWL, flooding impacts the Pinole/Hercules Water Pollution Control Plant, which is completely flooded at 66" TWL. At 66" TWL, flooding also impacts nearby residential households on both sides of Pinole Creek, impacting residents in both the City of Hercules and City of Pinole. Regional systems are impacted by sea-level rise, starting at 12" TWL for the Pinole Creek Watershed PCA, and the San Francisco Bay Trail PCA. At 48" TWL the Waterfront District PDA and Union Pacific Railroad will experience their first exposure to flooding, into Chelsea Wetlands and low-lying areas adjacent to Railroad Ave. The Waterfront District PDA is exposed to flooding beginning at 66" TWL from Refugio Creek, however all flooding appears to be within current open space areas.

*Figure 15. Sea Level Rise*


## TOTAL WATER LEVEL: 52-inches

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**explorer.adaptingtorisingtides.org**

| Sea Level Rise | + | Storm Surge |
|---|---|---|
| 12" | | 100-year |
| 18" | | 50-year |
| 24" | | 10-year |
| 30" | | 5-year |
| 36" | | 2-year |
| 52" | | No Storm Surge |

**Depth of Flooding**

- 12+ feet
- 10 - 12 feet
- 8 - 10 feet
- 6 - 8 feet
- 4 - 6 feet
- 2 - 4 feet
- 0 - 2 feet

**Shoreline Overtopping**

- Overtopping
- No Overtopping

**Legal Delta**

- Legal Delta

*At the regional scale, these scenarios present average water levels that are representative of what could occur along the entire Bay shoreline. The mapped scenarios are based on binning the water levels with a tolerance of ±3 inches.*

Icons by Icons8. Map tiles by ESRI.

### CREEK OVERFLOWS

When the surface runoff exceeds the capacity of the creek channel to carry the flow, creek overflows result. Pinole and Rodeo Creeks drain relatively small portions of the City while the drainage basin of Refugio Creek covers most of the City and extends beyond the City boundary to the east. Pinole and Rodeo Creeks are adjacent to the northern and southern City boundaries and drain the neighboring communities of Pinole and Rodeo.

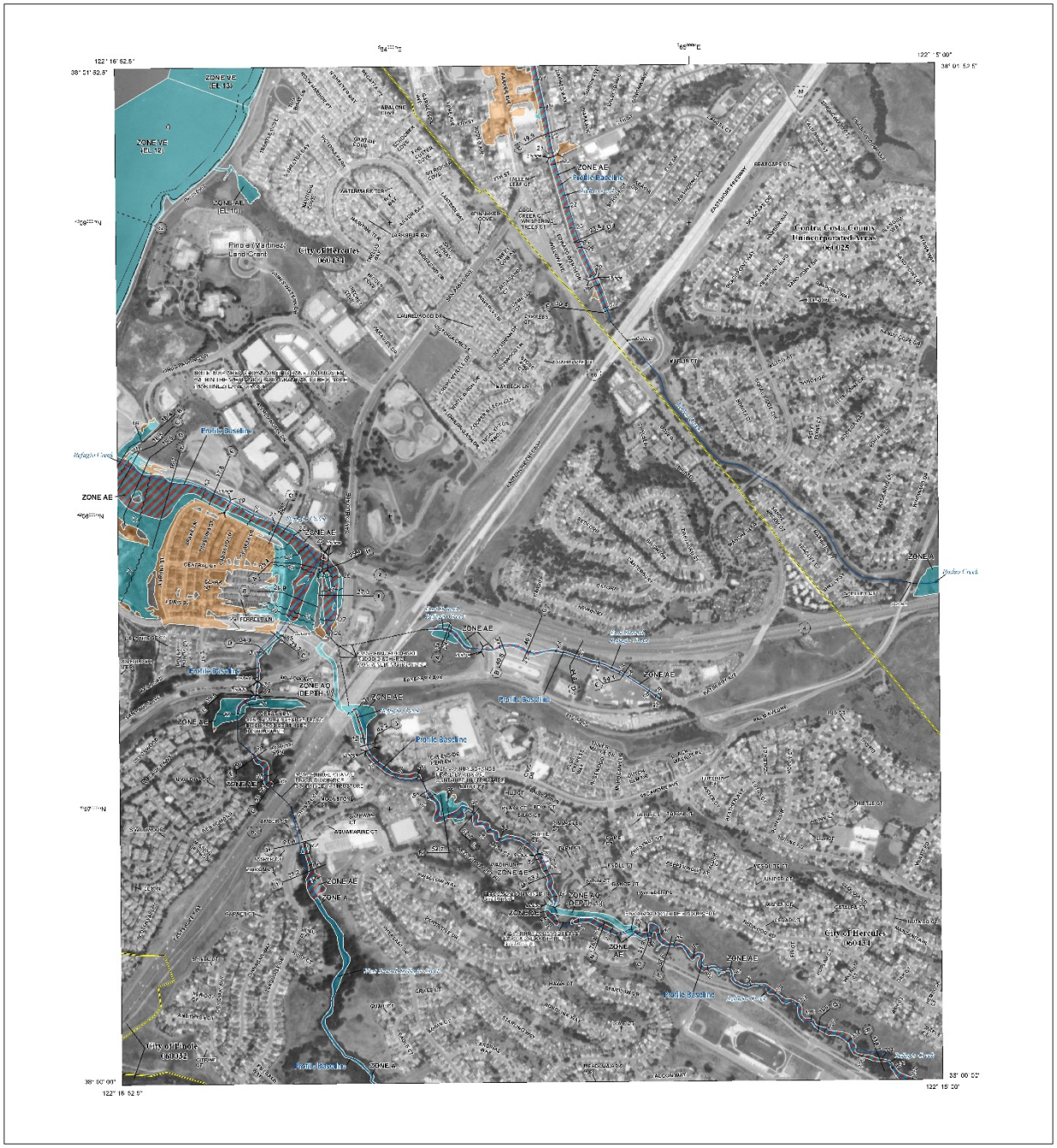
Flood Insurance Rate Maps (FIRMs), which are prepared by the Federal Emergency Management Agency (FEMA), identify potential flood zones (Figure 16 and Figure 17). Flood hazards related to storm events generally are described in terms of a 100-year or 500-year flood. A 100-year flood is defined as a major flood event that has a one percent or greater chance of occurring during any one year. Flood hazard planning practices address such storms, as well as 500-year events. These floods are considered severe; however, such flood events can be reasonably predicted and therefore reasonably mitigated. No areas within the City or Sphere of Influence have been identified within 500-year flood hazard areas. However, certain areas of the city (generally adjacent to creeks) have been identified to be within the 100-year flood zones, but they do not include any structures. These areas have a one-percent chance of inundation at varying depths.

The lower channel of Refugio Creek has had a history of overflowing. Improvements to the lower channel in recent years have reduced the potential for flooding both upstream and downstream. Approximately 2,500 linear feet of Refugio Creek adjacent the Bayside subdivision was realigned and restored in 2004, and an additional 1,500 linear feet of Refugio Creek adjacent Bayside and Baywood was restored in 2017. As part of the restoration, the creek was relocated to a new 180-foot wide channel to convey flood flows. For specific elevations of flooding, please see the Flood Insurance Rate map (Community Panel Number 0604340008B and 0604340009B) on file with the City of Hercules or the Official Flood Insurance Rate Maps online at FEMA's mapping website: https://msc.fema.gov/.) According to the Director of Public Works/City Engineer, there are no lots within the City of Hercules subject to 100-year flooding because of improvements made over time, and FEMA rate maps were recently updated to reflect this improvement. There are also no Levee Protection Zones in the City of Hercules, therefore no areas of inundation from possible failure.

### STANDING WATER FROM EXCESS RAINFALL

Standing water from excess rainfall could occur in low-lying and level areas if the natural drainage channels were interrupted or modified by grading or impervious soils prevented the rapid infiltration of rainfall into the ground. Protection and improvement of drainage channels should be provided. At the community workshop, the public was concerned about low-lying flooded water at the intersection of Canterbury and Willow Avenues, and the exit road from Refugio Valley Road and Bonaire Avenue. The Public Works Director is aware of this flooding and takes steps annually to direct traffic safety with vehicle diversion and associated signage. Stormwater management is addressed in Hercules Municipal Code Title 5, Chapter 8, and protects and enhances the water quality pursuant to and consistent with the Porter-Cologne Water Quality Act and the Federal Clean Water Act.

*Figure 16. FEMA Flood Insurance Rate Map 1*




## FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) Zone A, AO
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee See Notes. Zone X

OTHER AREAS
- NO SCREEN Areas Determined to be Outside the 0.2% Annual Chance Floodplain Zone X
- Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 18.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

## NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products, or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

Communities participating in the National Flood Insurance Program (NFIP) have adopted and enforce floodplain management ordinances that meet or exceed NFIP requirements. These ordinances may be more restrictive or comprehensive than the NFIP and should be used in conjunction with the effective Flood Insurance Study report and this FIRM.

For communities with zones labeled AO, flood depths or flood elevations are shown on this FIRM. For communities with base flood elevations (BFEs) shown on this FIRM, the elevations must be used for insurance purposes and for floodplain management.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in special flood hazard areas may be protected by flood control structures. Refer to the Flood Insurance Study report for this jurisdiction for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was California State Plane Zone III (FIPSZONE 0403). The horizontal datum was NAD 83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in mapped features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988 (NAVD 88). These flood elevations must be used for regulatory purposes. Users should be aware that BFEs shown on this map may have been determined by using NAVD 88 conversion factors that have been interpolated from published values. Conversion factors to other vertical datums may vary. For more information, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by the USDA National Agriculture Imagery Program (NAIP). This information was photogrammetrically compiled at a scale of 1:12,000 from aerial photography dated 2013.

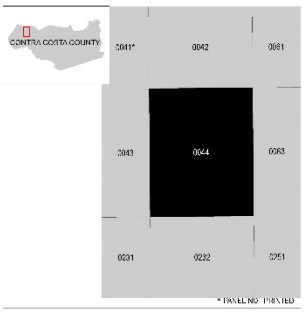
## SCALE

1 inch = 500 feet 1:6,000

0 500 1,000 2,000 Feet

0 125 250 500 Meters

## PANEL LOCATOR




* PANEL NOT PRINTED

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

CONTRA COSTA COUNTY, California
And Incorporated Areas

PANEL 44 OF 602

Panel Contains:

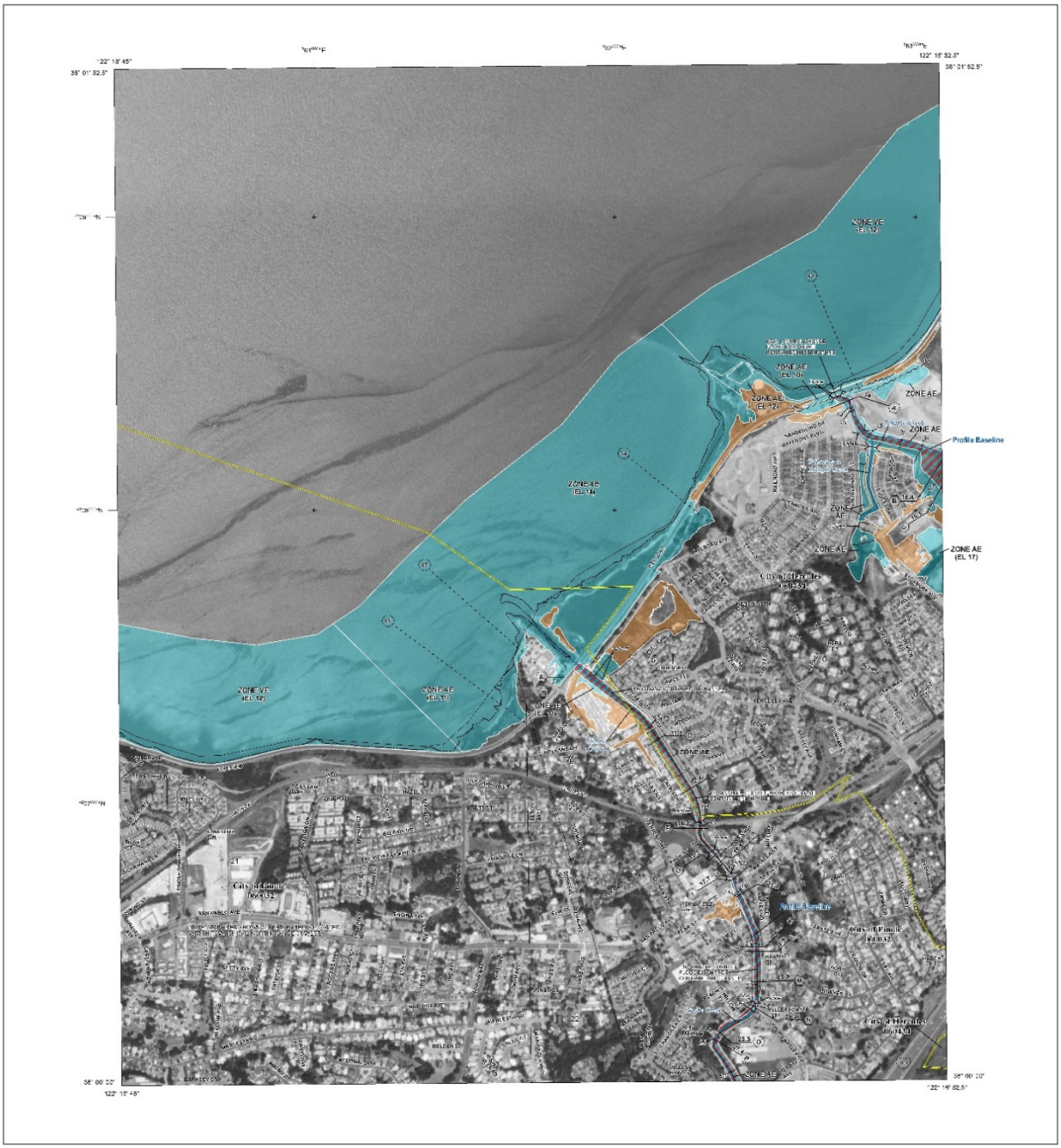
| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| CONTRA COSTA COUNTY | 060025 | 0044 | H |
| HERCULES, CITY OF | 060426 | 0044 | H |
| PINOLE, CITY OF | 060032 | 0044 | H |

VERSION NUMBER
2.3.3.2

MAP NUMBER
06013C0044H

EFFECTIVE DATE
March 21, 2017

*Figure 17. FEMA Flood Insurance Rate Map*



# NON-NATURAL HAZARDS

## RAIL TRANSPORT OF HAZARDOUS MATERIALS

The City of Hercules has three railways, including two along the waterfront— Union Pacific and Amtrak (Capitol Corridor) lines—while the BNSF rail lines runs through the central part of the city. Both railways are used to transport crude oil and other cargo. In 2012, 70% of oil imported by California refineries came through marine terminals, such as the Richmond and Oakland marine terminals (Figure 18).

**State Oversight:** The California Public Utilities Commission (CPUC) is the State agency charged with ensuring the safety of freight railroads, inter-city and commuter railroads, and highway railroad crossings in the State of California. CPUC performs these railroad safety responsibilities through the Railroad Operations and Safety Branch (ROSB) of the Safety & Enforcement Division.

**Federal Oversight:** The Federal Rail Administration (FRA), which resides in the Department of Transportation (DOT), is responsible for regulating the shipment of petroleum crude by rail. Under authority delegated to FRA by the Secretary of Transportation, the Hazardous Materials Division administers a safety program that oversees the movement of hazardous materials (including dangerous goods), such as petroleum, chemical, and nuclear products, throughout the Nation's rail transportation system, including shipments transported to and from international organizations.

As oil by rail shipments increase in California, there has been a dramatic increase in number of accidents involving crude oil by rail. The causes of accidents vary, but include track failure, inadequate rail car equipment, and human error. Some of the crude oil from Bakken shale formation (Canada) is inherently more flammable, making rail car ruptures more likely. On average, the Richmond Chevron Refinery processes about 250,000 barrels of crude oil per day as well as other products such as lubricants. Crude oil is delivered by boat, and refined products distributed by truck, including I-80 thru the City of Hercules.

There have been two known fires caused by BNSF Railway that have affected the City of Hercules, one in 2005, and another in 2019. One July 24th, 2019, a fire aboard a BNSF Railway freight train started a grass fire near Christie Road not far from state Highway 4 and the Franklin Canyon Golf Course. MTC/ABAG Hazard Map also shows a fire in 2005 called the BNSF fire that burned around 100 acres. No other information was provided, and no news stories were found.

## POWER SHUTOFFS

In order to keep communities safe, the Pacific Gas & Electric Company (PG&E) has begun Public Safety Power Shutoffs (PSPS) during extreme weather or wildfire conditions. Electrical power disruptions can occur at any time during the year whether intentionally caused by the utility's Public Safety Power PSPS or unintentionally caused by accident, extreme weather, or natural disaster.

During times of extreme fire danger with gusty winds and dry conditions PG&E may implement a PSPS. The power shutoffs are intended to reduce the risk of energized power lines sparking or becoming damaged and starting a wildfire. In October 2019, PG&E implemented a PSPS that affected over 900,000 Northern California customers, and on October

27th, 2019, over 3 million people across California were without power. The City of Hercules did not experience any prolonged power shutoffs during this time, but the PSPSs will continue, and the city should prepare accordingly for future events.

The impact of the power shut-off for residential property occupants (the vast majority of whom do not have back-up energy supplies for electronic devices) can be a loss of refrigeration for food and medical supplies, limited cooking facilities, no heating or cooling, no lighting, inability to open garages, and limited or no access to the internet and critical information. In anticipation of further PSPS events, some residential property owners have purchased commercial-grade back-up power generators, which also produce high noise levels and gas smells. For commercial properties, many of the small businesses lack generators and may have to throw-away food, while other businesses may have inadequate interior lighting to continue to remain open.

### EPIDEMICS

The citywide survey responses indicated that over 50% of the people that responded were concerned about epidemics. Infectious disease emergencies are circumstances caused by naturally occurring outbreaks (e.g., measles, mumps, meningococcal disease), emerging infectious diseases (e.g., COVID-19, SARS, pandemic influenza), and bioterrorism. The potential for significant illness or death in a population can occur. The City of Hercules has limited authority in medical crises and relies on the County, State, and Federal authorities for Health Department data, control, guidance, and treatment, but the City can participate in disease prevention education and preventive measures while conducting local business.

### HAZARDOUS MATERIALS

A community-wide survey conducted in December 2019 confirmed that the primary non-natural hazard of concern to the public is hazardous materials. The County of Contra Costa has a Hazardous Materials Commission, an Interagency Task Force, and staff that run a variety of programs including: Household Waste Program; Waste Reduction and Recycling Program; Above-Ground Petroleum; Lead Poisoning Prevention; and Integrated Pest Program, to name a few.

The State of California Department of Toxic Control Substances (DTSC) protects California's people and environment from harmful effects of toxic substances by restoring contaminated resources, enforcing hazardous waste laws, reducing hazardous waste generation, and encouraging the manufacture of chemically safer products.

The City of Hercules has a Hazardous Waste Management Plan Element (1990) which includes inventories of existing hazardous waste generation and export, projects hazardous waste generation to the year 2000, and defines facilities siting needs and criteria. The City could benefit from its update.

### ACTIVE SHOOTER

The City of Hercules Emergency Operations Plan (2008) recognizes several potential targets within the City where an Active Shooter situation could manifest. An active shooter is a person actively causing serious bodily injury or death to multiple victims by gun. These situations have historically occurred in the United States workplace, school grounds, shopping centers, and transit centers. Although an active shooter situation has not occurred in the City of Hercules, the Emergency Action Plan identifies techniques and tactics used to respond, to isolate the individual, and neutralize

the threat of shooting. The City has primary objectives and priorities for responding personnel in a checklist, as well as Active Shooter Protocol.

### EVACUATION ROUTES AND ALTERNATIVES

The City of Hercules has planned for emergencies and hazards including wildfire, terrorism, and earthquake. The City follows adopted emergency operation procedures and makes determinations for responses on a case-by-case basis. If evacuation would be required, the City is served by major state highways, and there are five routes out of town: San Pablo Avenue (north and south), I-80 (north and south), and State Route 4 (east). Alternative routes include access to Pinole via Turquoise Drive and Dean Court, and access to Alhambra Valley Road via Refugio Valley Road and Goat Road. For more detail on evacuation routes, and alternatives see the detailed section in Natural Hazards and the City of Hercules Circulation Element.

### CHALLENGES FOR EMERGENCY ACCESS

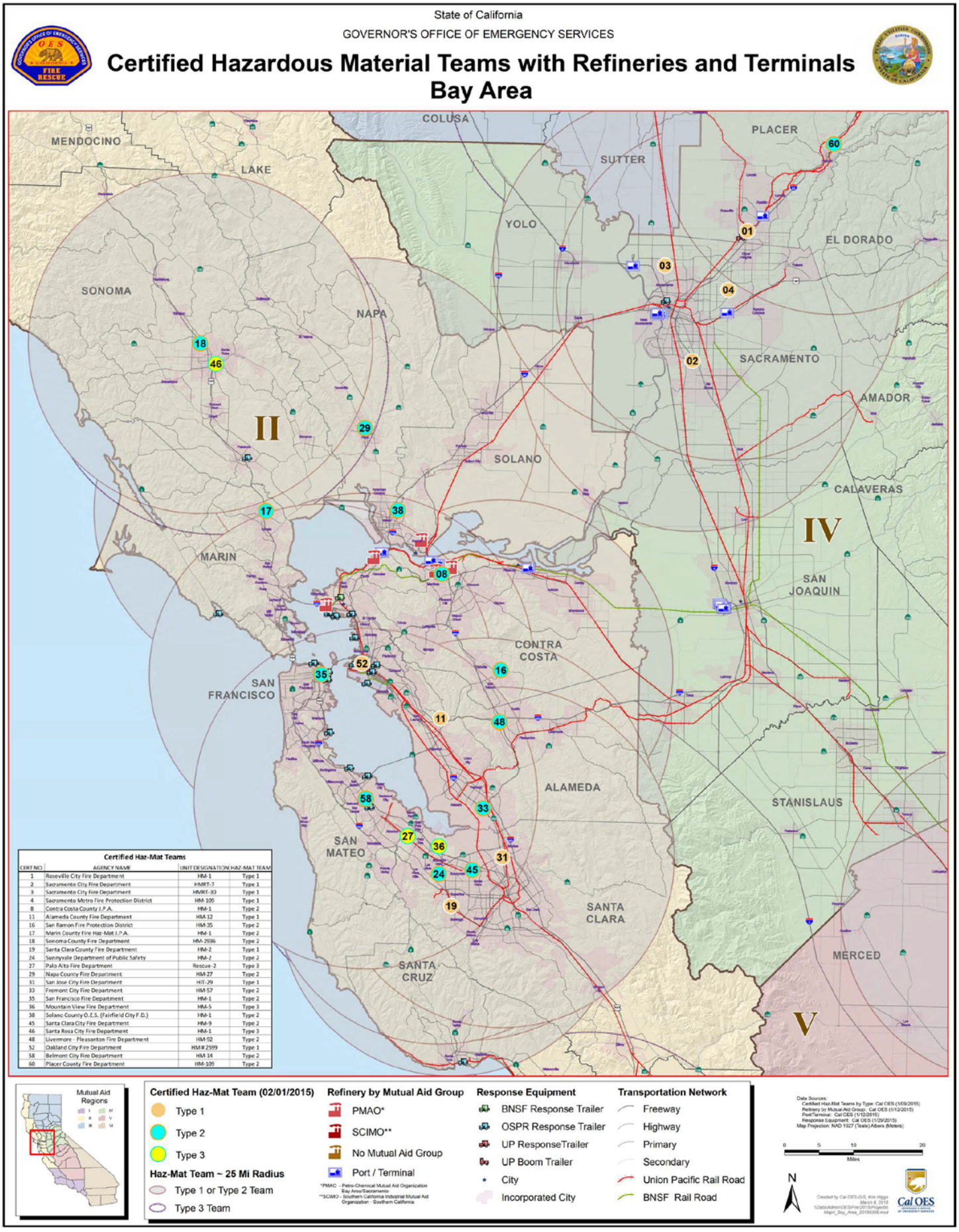
There are limited routes into and out of Hercules and many of them pass through single intersections, such as San Pablo Avenue and Sycamore Avenue. If these roads or intersections are closed or so badly congested during an emergency that traffic does not move, emergency access or egress can be lost for large portions of the population and businesses. Almost all the evacuation routes are dependent on structures including bridges, railroad under crossings, and freeway structures and would be vulnerable to closure in case of structural failure. Structures in City are inspected annually and are in good working order. Exception would be vehicular bridge across Pinole Creek that is blocked off and not open for use because it is structurally deficient. The structural integrity of bridges, railroad under-crossing, and freeway structures not in the city's jurisdiction is unknown.

Similarly, many residential developments have only one collector road linking homes to San Pablo Avenue or Willow Avenue. If anything blocks the road during an emergency, access or egress for the residents will be significantly restricted.

SR 4 and San Pablo Avenue also pass within proximity of refineries, which might themselves be the cause of an evacuation. Under such conditions, these routes might also become impassable.

If WETA ferry service is added to the future Regional Intermodal Transportation Center, this will provide a secondary egress point for Hercules, taking advantage of the City's proximity to San Pablo Bay for water-borne evacuation for non-water-based emergency events.

*Figure 18. Hazardous Material Transpiration*




| CERT NO. | AGENCY NAME | UNIT DESIGNATION | HAZ-MAT TEAM |
|---|---|---|---|
| 1 | Roseville City Fire Department | HM-1 | Type 1 |
| 2 | Sacramento City Fire Department | HMRT-7 | Type 1 |
| 3 | Sacramento City Fire Department | HMRT-30 | Type 1 |
| 4 | Sacramento Metro Fire Protection District | HM-106 | Type 1 |
| 8 | Contra Costa County J.P.A. | HM-1 | Type 2 |
| 11 | Alameda County Fire Department | HM-12 | Type 1 |
| 16 | San Ramon Fire Protection District | HM-35 | Type 2 |
| 17 | Marin County Fire Haz-Mat J.P.A. | HM-1 | Type 2 |
| 18 | Sonoma County Fire Department | HM-2586 | Type 2 |
| 19 | Santa Clara County Fire Department | HM-2 | Type 1 |
| 24 | Sunnyvale Department of Public Safety | HM-2 | Type 2 |
| 27 | Palo Alto Fire Department | Rescue-2 | Type 3 |
| 29 | Napa County Fire Department | HM-27 | Type 2 |
| 33 | San Jose City Fire Department | HIT-29 | Type 1 |
| 33 | Fremont City Fire Department | HM-57 | Type 2 |
| 35 | San Francisco Fire Department | HM-1 | Type 2 |
| 36 | Mountain View Fire Department | HM-5 | Type 3 |
| 38 | Solano County O.E.S. (Fairfield City F.D.) | HM-1 | Type 2 |
| 45 | Santa Clara City Fire Department | HM-9 | Type 2 |
| 46 | Santa Rosa City Fire Department | HM-1 | Type 3 |
| 48 | Livermore - Pleasanton Fire Department | HM-92 | Type 2 |
| 52 | Oakland City Fire Department | HM # 2599 | Type 1 |
| 58 | Belmont City Fire Department | HM-14 | Type 2 |
| 60 | Placer County Fire Department | HM-106 | Type 2 |

Section 3

# Goals, Objectives & Policies

# 3. GOALS & POLICIES

This section of the Safety Element presents goals, policies, and implementing actions.

The City of Hercules Safety Element goals are to reduce loss of life, injuries, damage to property, and economic and social dislocations resulting from seismic, geological, flood, fire, and climate change hazards.

In addition to the goals, the City of Hercules objectives are to:

- Identify hazards and minimize exposure to hazards from either natural or human-related causes.
- Establish adequate design and safety standards to reduce risks.
- Incorporate safety considerations into the planning process.
- Anticipate the potential for disasters; maintain continuity of life-support functions during an emergency; and maximize efforts for post-emergency recovery.
- Ensure all emergency plans are up-to-date and reflect current partnerships and roles and responsibilities.
- Increase citywide and individual risk reduction and emergency preparedness.

The goals, policies, and implementation actions respond to the analysis contained in the preceding sections and are intended to address the objectives of the City of Hercules.

## Climate Change Mitigation and Adaptation Co-Benefits

[Co-benefits are the added benefits gained from a policy, above and beyond the direct benefits. They are sometimes referred to as "multiple benefits" or "synergies". Climate change mitigation and adaption is an additional or co-benefit of many of the city's Goals, Policies, and Implementation Actions throughout the General Plan. Climate change issues tend to be looked at in isolation, however if multiple benefits are considered, there is usually a far stronger case for investment. Climate change mitigation and adaption co-benefits in the Safety Element will be signified by the following symbol.]

# GOAL 1

Consider potential seismic, geologic, flood, and fire hazards and introduce adequate safety measures in development plans and proposals.

### POLICY 1.A: INTEGRATE & ENFORCE SAFETY POLICES

Seismic, geologic, flood, and fire safety policies will be integrated into other mandatory elements of the General Plan. Administration and enforcement of municipal regulations provide positive measures for implementing safety policies.

#### Implementation Actions

**1.A.1 Planning Review.** Planned development plans must be prepared and adopted for all new development projects. Safety measures will be incorporated into these planned development plans to provide adequate protection from seismic, geologic, flood, fire hazards, climate impacts (sea-level rise, local ecosystems ability to adapt). The review and approval of zoning applications, tentative maps, and planned development plans shall include consideration of safety policies and standards contained in the General Plan and other area plans.

**1.A.2 Subdivision, Zoning, and Grading Regulations.** The subdivision, zoning, and grading regulations govern the subdivision of land and the design and construction of site improvements. Minimum road widths and clearances around structures for emergency access shall be specified. Seismic, geologic, flood, and fire hazards shall be considered in the review and approval of tract maps, grading, and improvement plans. Update of codes should be aligned with the Hazard Mitigation Plan and Safety Elements.

**1.A.3 Building and Fire Codes.** The City Council has adopted both the Uniform Building Code, and the Uniform Fire Code Fire zones have also been designated in the City.

- The Uniform Building Code provides minimum safety standards by regulating the design, construction, materials use, and occupancy of buildings and structures within the City.
- The Fire Code governs the maintenance of buildings by regulating the storage and handling of dangerous materials and by requiring adequate egress facilities.
- Fire Zones limit the potential fire size, thereby preventing major conflagrations. All commercially zoned land in the City is designated Fire Zone 2, and the remainder is in Fire Zone 3. Fire Zone restrictions involve building construction and the division of large building areas by fire walls.

**1.A.4 Emergency Operations Plan.** An Emergency Operations Plan has been prepared and should be maintained to provide responsibilities and procedures, including mass casualty response and staging areas, in the event of a major disaster or emergency in the City. This plan is compatible with the State of California and the Office of Emergency Services. The Emergency Operations Plan and the Circulation Element designate emergency evacuation primary and secondary routes.

**1.A.5 Capital Improvement Program.** The Capital Improvements Program is a five-year program for municipal capital expenditures that are evaluated annually. The Capital Improvement Program spending plan implements the city's Strategic Plan, which should be amended to also include implementation of the general plan and its elements. Consider upon its next update adding applicable and appropriate Adapting to Rising Tides climate risk programs.

[Co-benefit: The Capital Improvement Program provides an important tool the city can use to mitigate risk and promote climate change resilience in the city. By focusing capital investments toward low-carbon projects that reduce greenhouse gases (GHG) Hercules can build a more resilient city.]

**1.A.6 Location of New Essential Public Facilities.** Locate, when feasible, new essential public facilities outside of flood and fire hazard zones, including hospitals and health care facilities, emergency shelters, fire stations, emergency command centers, and emergency communications facilities. When such location is necessary, identify construction methods or other methods to minimize damage.

**1.A.7 Fire Education.** Focusing on the subdivision adjacent to the WUI, educate the public about climate impacts and risks, urban-wildland interface, primary and secondary evacuation routes, defensible space clearance, and low-fire susceptibility landscaping and building materials. Consider the Storm Ready or FireWise model for training and fire education focused on linguistically isolated households.

**1.A.8 Regional Intermodal Transportation Center Evacuation Plan.** Include in the project plan Transportation Center Ferry Service as a water-borne evacuation opportunity.

**1.A.9 Evacuation Centers.** Ensure all areas of the city have access to a reliable evacuation center, place the evacuation centers into a centralized location on the cities website and educate the public on their locations.

**1.A.10 Secondary Evacuation Routes.** Review adequacy of primary and secondary evacuation routes in various types of emergencies, and methods of public communication during a disaster. Identify a prominent location on city's website for public communication.

**1.A.11 Climate Action Strategy and Resiliency Programs.** Consider completing a City of Hercules Municipal Climate Action Plan to identify internal city greenhouse gas reduction or climate resiliency strategies.

[Co-benefit: The best way to address climate change is to drastically reduce GHG emissions. A Climate Action Plan would set greenhouse gas (GHG) emission reduction targets and develop actions to address the negative outcomes of climate change.]

**1.A.12 Climate Budget Expenditures.** Identify for City Council staff reports budget expenditures and their relationship to greenhouse gas reduction or climate resiliency strategies.

[Co-benefit: Climate change mitigation and adaptation will require substantial investments in the short and long term. City Council will receive information on the short-term & long-term cost as well as the social cost and

benefits of budget expenditures, to better decide how much to spend on measures to reduce greenhouse gas emissions.]

**1.A.13 City Strategic Plan.** Upon its next update of the city Strategic Plan, consider adding climate impacts and risks to the content.

# GOAL 2

Minimize exposure of facilities and development to seismic hazards.

### POLICY A.2: SEISMIC EVALUATION & CRITICAL FACILIIES

No critical facility or school shall be permitted in areas subject to very strong ground shaking or ground failure until an evaluation of alternative sites with reduced seismic hazards are completed.

#### Implementation Actions

**2.A.1 Critical Facilities Siting.** For each proposal, require a feasibility study to determine whether any proposed critical facilities (emergency response centers, police stations, and hospitals) and schools could be sited in areas with lesser seismic hazards. An alternative site feasibility assessment shall include a consideration of sites in areas with lesser seismic hazards in addition to evaluations of service area, accessibility, and economic considerations.

### POLICY 2.B: SEISMIC EVALUATION & CRITICAL FACILIIES

Projects proposed for all critical facilities including schools, high population facilities, and industries using or generating significant amounts of hazardous materials within areas subject to very strong earthquake ground shaking or ground failure shall conduct geotechnical studies and structural design evaluations.

#### Implementation Actions

**2.B.1 Alternative Site Feasibility for Critical Facilities.** If the alternative site feasibility study for a critical facility or school were to indicate that other less hazardous sites are not available, then geotechnical studies and structural design analyses for the facility shall be conducted in compliance with State of California requirements and recommendations of the Seismic Safety Commission. These should include detailed studies of the geologic materials at the site, seismic event response evaluations to identify design criteria, foundation design criteria, and dynamic method analyses of proposed structures.

**2.B.2 Optional Site Feasibility Non-Critical Facilities.** For development excluding critical facilities and schools, the alternative site feasibility assessment will be an optional requirement of the City (an alternatives site evaluation may be required under CEQA). A rigorous geotechnical evaluation and structural design analyses will be required to ensure that the proposed structures perform adequately in major earthquakes without creating a safety hazard to occupants or people in surrounding areas.

**2.B.3 Emergency Operations Center Alternative.** Identify an alternative location for the emergency operations center located in the police department, if that were damaged.

**2.B.4 Emergency Center Location.** Evaluate the adequacy of emergency shelter by population and evacuation location, staging area for a given scenario, and confirm tentative agreements with shelter locations are confirmed (e.g., Valley Bible Church).

**2.B.5 Emergency Shelter Use.** Clarify and educate the public on emergency shelter uses such as clean air center, cooling station, mass casualty staging, and evacuation uses.

**2.B.6 Coordinate School Evacuation Training.** Coordinate with school districts on evacuation routes and training on techniques of evacuation.

### POLICY 2.C: PREPAREDNESS & EMERGENCY RESPONSE

The City will update the Earthquake Preparedness and Emergency Response Plan as necessary to establish emergency access points to evaluate the comprehensiveness of the City's evacuation routes in relation to the specific effects of seismic-induced ground shaking, liquefaction, and lurching within the community.

#### Implementation Actions

**2.C.1 Update Emergency Response Plan.** The City Manager will coordinate the relevant departments within the City during any update of the Earthquake Preparedness and Emergency Response Plan.

**2.C.2 Emergency Water Supply.** Implement an emergency water supply program to provide potable water to the City population if normal water supplies are disrupted due to seismic events or other causes. The emergency water supply should be enough to supply the City population with a minimum designated potable water allowance to be determined by the program.

**2.C.3 Building Inspection Contract.** Ensure future contracts with the County of Contra Costa for building inspection, including post-emergency response building inspection to evaluate structure stability (e.g., red tagging).

### POLICY 2.D: GEOTECHNICAL EVALUATIONS

The administration of subdivision and grading ordinances should allow for flexibility in the review and approval of construction plans to permit sound engineering design in the solution of specific geological problems. Site-specific geotechnical investigations shall be required for every new development.

#### Implementation Actions

**2D.1 Geotechnical Evaluations Required.** Applications for subdivision and development projects shall include site-specific geotechnical investigations prepared by a California-certified engineering geologist documenting: the geotechnical suitability of the site for the proposed development based on soil and underlying substrate conditions; and the measures required to ensure public safety and the protection of property for individual building construction. The following shall be implemented through adoption as conditions of approval for the project.

- Loose or improperly compacted existing fills and backfills should be excavated from areas to be filled.
- All areas to be graded should be stripped of vegetation and the top few inches of highly organic topsoil.
- Organic topsoil should be stripped and stockpiled and used for landscaping.

- Lower valley areas where bay mud deposits are exposed or are blanketed by shallow thicknesses of poorly compacted fill will require detailed studies prior to site grading.
- Sidehill “sliver” cuts and fills should be avoided.
- Special consideration should be given to slope stability in the steep hillside areas regarding mudslides and landslides. New structures should be sited away from steep hillsides and the toes of existing landslide surfaces, reducing the potential for damage from landslide movement or burial.
- Building specific geo-technical analysis for building construction, and site stability is required at building permit.
- Steep side slopes should be left in their natural condition where possible.
- Minimize the potential for creating new landslides or reactivating old ones. Setbacks should be determined based on detailed soils investigations in individual cases opposite landslide prone slopes to reduce the potential for slide damage to improvements.
- Expansive soils should be considered in the design of road pavement sections.
- Site planning should consider the potential of differential settlement where compressible soils exist and employ appropriate approaches to reducing the hazard to an acceptable level of risk.
- Areas underlain by soft bay mud will require further detailed soils investigations.
- Slopes should be planted as soon as possible after completion of construction to develop a protective organic mat.
- Dense pockets of brush and trees located on steep slopes should be left intact where possible to prevent potential landslides.
- The sides of the stream channel in portions of Refugio Valley should be improved to protect erosion-induced slumping. Care should be taken to maintain the natural appearance of the watercourse in the open space areas.
- Development of the site shall minimize the amount of native soils compacted by construction vehicles and structures, as well as the amount of soil disturbed through grading and excavation. As much as possible, native soils shall be left undisturbed and used for open space and landscaping purposes.
- Development of the sites shall also maximize the use of pervious materials, including fill, and incorporate proper drainage structures capable of handling anticipated increases in surface runoff.
- Minimize amount of grading when building on hill sides. No grading shall occur on slopes steeper than 30 percent, and cut slope angles no greater than 33 percent shall be maintained.

**2D.2 Erosion Control Standards as Conditions of Approval.** Applications for subdivision and development projects shall include site-specific erosion control and hillside drainage plans, which shall address the following standards. These standards shall be implemented through adoption as conditions of approval for the project

- The use of silt fencing, sediment trapping basins, runoff diversion devices, and hydro seeding of barren slopes shall be required to minimize or prevent erosion impacts.
- Grading in the City shall occur with no increase in discharge of sediments to wetlands, creeks, or San Pablo Bay.

**2.D.3 Investigate Fault Traces.** Further investigations of possible fault traces should be made in the vicinity of the Pinole Traces and Pinole Ridge. Setbacks from located fault traces should be based on geological engineering recommendations.

# GOAL 3

Ensure that adequate fire protection is provided throughout the city and that all new structures conform to current fire safety standards.

### POLICY 3.A: FIRE SERVICE

The City should continually evaluate the alternatives for providing adequate fire service to meet the changing needs of the City in the most efficient manner.

#### Implementation Actions

**3.A.1 Assess Fire Impact Fees.** The City shall assist the Rodeo-Hercules Fire Protection District in processing the collection of fire impact fees from all new development within the City.

**3.A.2 Update Fire Impact Fees.** The City shall support the Rodeo-Hercules Fire Protection District in providing data to update its fire impact fees for new development to reflect the actual demand for services.

**3.A.3 Fire Plan Review.** The City shall work with the Rodeo-Hercules Fire Protection District to determine specific needs for fire protection when a development proposal is reviewed and shall ensure that these needs are met.

**3.A.4 Response Times.** Fire Station(s) shall be in the City so that first response units achieve a five-minute emergency response time for 90% of all emergency calls. Fire Stations shall be sized to accommodate a minimum of two (2) engines/trucks and three-person, 24-hour crews.

### POLICY 3.B: FIRE HAZARD MITIGATION

New development shall be designed to minimize exposure to fire hazards.

#### Implementation Actions

**3.B.1 Fire Safety in New Subdivisions.** Subdivision and planned development plan applications shall include measures to promote fire safety. These measures shall be evaluated during application review and implemented through adoption as conditions of approval for the project, including:

- Road circulation for fire and emergency vehicle access.
- Access to structures and open spaces.
- Fire flow needs, and other peak-load water flow needs for emergencies.
- Landscape design.
- Visible street signs.
- Avoid locating structures near hazardous materials distribution pipes.

**3.B.2 Open Space as Fire Buffer.** Subdivision and planned development plan applications shall include open spaces measures to promote fire safety. These measures shall be evaluated during application review and implemented through adoption as conditions of approval for the project, including:

- A buffer of irrigated landscaping and/or plowed area maintained between open spaces and developed areas.
- Fire access trails in major open spaces to allow fire equipment to penetrate. These trails could be part of the citywide system of trails.
- The use of fire-resistant plant materials in open space landscaping.
- Containment of potential fires where natural vegetation exists in open spaces.
- Responsibilities for maintenance of fire trails and fire breaks and for cleaning vegetated areas should be clearly defined in planned development plans and conditions of approval.
- Application of the Fire and Building codes.

[Co-Benefit: Open space fire buffers will lessen the environmental impact of wildfires, by reducing the possibility of structures catching fire and releasing toxic chemicals into the air and waterways. Additionally, according to the Institute for Local Government, forests, parks, and open space lands serve as "carbon sinks" that can store greenhouse gas emissions that would otherwise contribute to climate change. The trees and plants within open spaces remove carbon pollution from the air we breathe.]

**3.B.3 WUI Measures.** Establish ongoing education and clean-up with property owners in the wildland-urban interface lands:

- Conduct annual WUI Education. Focus initial education on subdivisions with one point of ingress/egress. Education could include building clearance, fire resistant landscaping, selecting fire retardant building materials, evacuation education and drills, communication training, family preparation, and self-sufficiency.
- The City shall collaborate with county agencies and partner with non-profits to maintain ongoing weed abatement and clearing of all primary and second evacuation routes, WUI interface lands outside city limits, and privately held lands and abutting privately developed properties. Strategies might include citywide deadlines for clearing, partnering with Conservation Corps for lower-cost removal, and offering two times a year free removal of up to 10-bags of yard waste.
- Conduct public education by distributing the Rodeo-Hercules Fire District WUI Fire Guide and the Community Wildfire Protection Plan from Diablo Fire Safe Council.

**3.B.4 Hazardous Materials Training**. Hazardous Materials spills from railway, I-80 roadway, local refineries, and distribution pipes through the city are a local hazard. The City and its Pinole Hercules Fire District partners should continue to work together on annual staff training, joint response, and collaboration on road closures, evacuation routes, and alternatives.

# GOAL 4

Reduce flood hazards and sea-level rise through flood channel improvements, development standards, and resiliency planning.

### POLICY 4.A: REFUGIO CREEK CHANNEL IMPROVEMENTS

Refugio Creek Channel outlet should be improved to provide adequate capacity for expected flood flows.

### Implementation Actions

**4.A.1 Stream Improvements.** Development projects along the Refugio Creek stream channel shall include plans to improve drainage flows consistent with protection of riparian habitats and wetlands as approved by California Department of Fish and Game and the US Army Corps of Engineers. (Note: see Open Space and Conservation Element).

[Co-Benefit: Incorporating measures to protect and improve the riparian habitat and wetlands areas will reduce pollution that could flow into Refugio Creek and San Pablo Bay from new and existing developments. Restoring the natural hydrology and vegetation of the riparian habitat and wetlands will also mitigate the risk of rising sea-levels and restore the natural flood protection provided by the creek.]

**4.A.2 Hydrology Study for Resiliency.** When the Open Space & Conservation Element is revised, amend Program 1.a.1 - Public Open Space (4) Salt Marsh, to study the hydrology and vegetation planting improvements necessary to address sea-level rise and long-term resiliency planning of Refugio Creek east of I-80.

[Co-Benefit: The salt marsh is an important ecosystem that provides food and cover for a variety of species including many nesting endemic birds and mammals. Conducting a study of the hydrology and native flora of the salt marsh and riparian habitat will help the city restore the ecosystem to its natural state.]

## POLICY 4.B: CHELSEA WETLANDS RESTORATION

Restore Chelsea Wetlands adjacent to Pinole Creek into functioning tidal wetlands.

### Implementation Actions

**4.B.1 Chelsea Wetlands Restoration.** Seek partners and money to restore Chelsea Wetlands into tidal wetlands to both restore wetland aquatic and transitional habitat while preserving and expanding flood conveyance and water storage capacity.

[Co-Benefit: Clean and plentiful drinking water for the city depends on healthy wetlands. Wetlands break down pollutants that would otherwise flow into nearby waterways or underground aquifers. Wetlands also provide natural flood control, and storm buffer to the city, by functioning as a sponge to trap and slowly release rain and surface water. Healthy wetlands also reduce the need for additional flood walls and dams in the future.]

## POLICY 4.C: FLOOD HAZARD

New Development shall be located and designed to minimize generation of and exposure to flood hazards.

### Implementation Actions

**4.C.1 Promote Flood Safety.** Subdivision and planned development plan applications shall include measures to promote flood safety. These measures shall be evaluated during application review and implemented through adoption as conditions of approval for the project.

- The City shall cooperate among public agencies responsible for flood protection.
- Review of any significant project proposals for areas which are not presently in flood zones should include an evaluation of increased downstream flows resulting from the project.

- Finished floor elevation of all developments must be one foot above the 100-year flood elevations prescribed on the Flood Insurance Rate Map. (See also Growth Management Element standard III.E.7).
- In order to protect lives and property, intensive development should not be permitted in reclaimed areas unless flood protection in such areas is constructed to the standards of the Flood Disaster Protection Act of 1973.
- City is a partner in risk mapping, assessment, and planning and can send Capital Improvement Project data, and recommend private sector project applicants send data ensure for Flood Insurance Rate Maps (FIRM) updates results in Physical Map Revisions (PMRs), and Letters of Map Revision (LOMRs). Letters of Map Amendment (LOMAs) and Letters of Map Revision Based on Fill (LOMRFs) can change flood hazard designations for specific structures or properties and reduce city wide flood insurance rates.

**4.C. 2 Add Hydrology Framework.** When the Open Space & Conservation Element is revised, add a more detailed hydrology framework addressing climate change, rising sea-level resiliency, and adaptation opportunities on inland creeks and storage ponds and along the shoreline.

[Co-Benefit: The hydrology framework links hillside to channel networks, creeks to the bay, subsurface to surface, land to atmosphere, and upstream to downstream. By incorporating climate change and sea-level rise into the Open Space & Conservation Element the city will better understand the connections within the hydrology framework and the relationship to climate change mitigation.]

**4.C.3 Sea-level Rise Planning.** Future waterfront development projects including critical infrastructure shall incorporate the BCDC Art Project 12" equivalent sea-level rise height, with a 100-years storm combined rise of 52" into project design

**4.C.4 Update City Website.** Include in the cities Flood Hazards, the FEMA maps https://www.ci.hercules.ca.us/government/engineering-public-works/flood-hazards introduce sea-level rise by cross referencing ART maps, and resiliency planning along creeks and wetlands as value.

**4.C.5 Recognize Tsunami Potential.** The Waterfront PDA build-out plans, the new ferry plans, train railway improvements, waterfront park, and Refugio Creek improvement plans should recognize and reflect the tsunami inundation line. In addition, appropriate tsunami warning sirens and signage shall be installed as appropriate.

**4.C.6 Stormwater Maintenance.** Complete the dredge project for Refugio Lake, and replace aerator for fountains for stormwater control.

**4.C.7 Green Infrastructure.** Consider amending municipal code Chapter 8, Stormwater Management and Discharge Control, to include green infrastructure requirements consistent with the Contra Costa County Green Infrastructure Plan dated July 2019.

[Co-Benefit: Green infrastructure can reduce urban heat island effects through its positive impact on infiltration and rainfall runoff, improved air quality through shade, filtering of pollutants provided by increased vegetation,

lower building energy demands by reducing indoor temperatures and shading building surfaces, and help replenish groundwater reserves.]

# GOAL 5

Reduce impacts from non-natural hazards (including hazardous materials transport by rail, oil and gas pipeline distribution; energy power shut-offs; active shooter) and natural hazards (including epidemics, flooding, and sea-level rise) through public education, community-wide training, and collaboration with key response partners.

### POLICY 5.A: HAZARDOUS MATERIALS BY RAIL

Address hazardous materials rail transportation and oil and gas pipeline distribution to protect adjacent residential and commercial businesses.

#### Implementation Actions

**5.A.1 Emergency Responder Education.** Seek additional funding for local emergency responders to purchase or maintain necessary specialized vehicles, equipment, and training for oil rail safety and flammable liquid.

**5.A.2 Mutual Aid Response.** Ensure Mutual Aid Response contracts include hazardous material emergency response aid and support.

**5.A.3. Rail Safety Measures.** Encourage the state to communicate to the federal government that the railroad industry should take additional safety measures, strengthen its inspection and enforcement resources, remedy gaps in emergency preparedness and response program, and provide the public an interactive map showing high risk areas from oil by rail traffic.

**5.A.4 Pipeline Setbacks.** Ensure the design of new subdivisions and construction of buildings are adequately setback from gas and oil pipelines, and that all pipelines are adequately signed.

### POLICY 5.B: PUBLIC POWER EDUCATION

Educate and prepare the public for power shut offs.

#### Implementation Actions:

**5.B.1 Public Education.** Collaborate with PG&E on educating the public about power shut-off notifications and updates.

**5.B.2 CERT Training.** As part of the public fire training, such as “Ready Hercules” or Community Emergency Response Team (CERT), include emergency planning for power shut offs.

**5.B.3 Safety Communication.** Identify primary and secondary communication systems and community alert systems when power is disabled. Consider alternatives such as Contra Costa County Warning System, combined with television, radio, NextDoor, Nixle, Facebook, and Twitter.

**5.B.4 HOA Partnerships.** Conduct education and training programs in coordination with homeowners' associations and block captains on emergency preparedness, a fire escape plan, registration for emergency notifications, use of battery powered lighting/crank radio, stored food/water, and first aid/CPR.

**5.B.5 Citywide Give-a-Ways.** Consider citywide give-a-ways include safety kits, crank radios, 72-hour survival guides and checklists for disaster preparation and clean-up.

**5.B.6 Noise Ordinance Update.** Update the noise ordinance to address noise levels from generators used in emergency power shut offs.

### POLICY 5.C: ACTIVE SHOOTER

The Active Shooter scenario shall be addressed in the City of Hercules Threat Assessment / Emergency Action Plan.

#### Implementation Actions

**5.C.1 Emergency Action Plan.** Update the Threat Assessment/ Emergency Action Plan to reflect current recommendations, technology, and approaches.

**5.C.2 Employer Education.** Educate the public on active shooter scenario public responses through employer training and public education.

### POLICY 5.D: INFECTIOUS DISEASE EMERGENCY PREPAREDNESS

The City of Hercules should prepare for infectious disease emergencies.

#### Implementation Actions

**5.D.1 Update Emergency Plan**. The City of Hercules will update its Threat Assessment / Emergency Action Plan (2008) to include an infectious disease section including a brief description and city / agency roles and responsibilities.

**5.D.2 Clarify City Role**. If an infectious disease becomes a citywide threat, as determined by the County Health Department, the City of Hercules shall communicate with its personnel and general public the information provided by the County, as appropriate.

# RESOURCES

### Attachments:

City of Hercules Local Hazard Mitigation Plan https://www.ci.hercules.ca.us/government/planning/safety-element-hazard-mitigation
Seismic and geologic hazards: https://pubs.usgs.gov/fs/2016/3020/fs20163020.pdf
Bay Mud map
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## Maps & Figures

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Figure 5. Landslide Susceptibility: Wills C.J., Perez, F., Gutierrez, C., 2011, Susceptibility to deep-seated landslides in California: California Geological Survey, Map Sheet 58, Published May 1 2011
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