7 | Hazards by Area

Planning areas Chapters 3-6 have analyzed four types of environmental hazards that have the potential to affect Oakland: geologic hazards, fire hazards, hazardous materials and flooding hazards. Each of those chapters contains one or two maps showing, in a generalized manner, the areas within Oakland that for various reasons are at particular risk from those hazards. Based on the analysis presented in those chapters, it is clear that the various neighborhoods, districts and areas of Oakland have distinct environmental-hazard profiles. The "Hazards by Area" chapter aggregates the identified hazards and correlates them with six distinct areas of the city (see below); also, the chapter provides an overview of the primary land use characteristics for each of the six areas and identifies the major environmental hazards of each area. For the purpose of analyzing and mitigating environmental hazards, the city has been divided into the following planning areas:

- West Oakland (including the seaport)
- Central Oakland
- East Oakland (including the airport)
- North Oakland
- The Lower Hills
- The Upper Hills

As explained in Chapter 1 ("Introduction"), all the maps in *Protect Oakland,* including the ones in this chapter, are generalized in nature and are not definitive on a site-specific basis. For this reason, it is likely that there are sites within areas shown on a map as being susceptible to a particular hazard in which that hazard is not present; conversely, it is also likely that there are sites outside an environmental-hazard area, as shown on the maps, that do present risks for that particular hazard. For development purposes, site-specific engineering, geotechnical, soils and other analyses are necessary to determine the level of risk on a give site for any environmental hazard.

West Oakland This is essentially the same planning area as that identified by the same name in the Oakland land use and transportation element. Its boundaries are roughly I-580 to the north, the Inner Harbor to the south, I-980 to the east, and San Francisco Bay to the west (see Figure 7.1). The area of West Oakland includes the various residential neighborhoods west of downtown such as Oak Center, South Prescott and West Clawson, as well as the seaport, the area of the former Oakland Army Base and the approach to the Bay Bridge.

West Oakland boasts a rich history, beginning with its selection as the terminus of the transcontinental railroad more than a century ago, and serving as one of the nation's ship-building centers during World War II. Over half of West Oakland's land area was created last century by the filling in of former San Francisco Bay marshland, and during that time the area's development has been shaped profoundly by transportation facilities and functions, a still-visible force: today, West Oakland is home to the fourth largest seaport in the country and is criss-crossed by a web of interstate highways and railroads. Because of its role as a transportation hub, West Oakland has developed a large number of industrial businesses and facilities. However, it is important not to lose sight of the fact that West Oakland is also home to approximately 25,000 residents and to some of the city's oldest residential districts. The city's general plan predicts little change in the population of the area through 2015 (an increase of just over four percent) but the strongest job growth of any planning area in the city (almost 38 percent), especially in the manufacturing and wholesale sectors.

Not surprisingly, given the area's history, the main environmental hazards of concern in West Oakland are related to the presence of hazardous materials and of large areas of Bay fill. As mentioned in Chapter 5 ("Hazardous Materials"), zip code 94607—which is largely synonymous with West Oakland—has the largest number of state Superfund sites and of facilities with underground storage tanks of all Oakland zip codes; is tied for

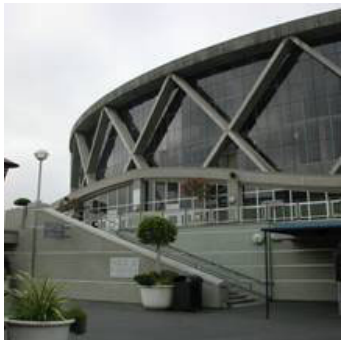
the largest number of sites on EPA's CERCLIS database of hazardous-waste sites; and has the second-largest number of P1-level facilities under the CalARP program and of facilities with aboveground storage tanks. Compared to the rest of the city, West Oakland must be considered to have a much higher-than-average risk of exposure to hazardous materials (including transportation-related and other accidental hazmat releases) and of industrial fires. Moreover, the area has some of the city's starkest incompatibilities between heavy-industrial and residential land uses, especially in the West Clawson neighborhood. Due to its underlying soils, the area is also at higher-than average risk for a variety of seismic hazards, namely liquefaction, settlement and strong, if not violent, ground shaking. Finally, the location of low-lying areas at the water's edge make the area more susceptible than most other parts of the city to various forms of inundation, namely tidal flooding, tsunami run-ups, and sea-level rise.

Central Oakland This area combines the "Central/Chinatown" planning area of the land use and transportation element and the parts of the "San Antonio, Fruitvale, and Lower Hills" planning area from the same element that are below I-580 (in other words, the San Antonio and Fruitvale neighborhoods but not the Lower Hills district). The area of Central Oakland is bound by I-580 to the northeast, High Street to the southeast, the Inner Harbor to the southwest, and I-980 to the west (see Figure 7.2). The area includes the central business district, Old Oakland, Jack London Square, Chinatown, Lake Merritt, the San Antonio and Fruitvale districts and a variety of smaller neighborhoods such as Adams Point, Pill Hill and the Gold Coast.

Central Oakland is the city's densest and most heavily populated area, with approximately 150,000 residents, and it contains well over half the city's jobs. As its name implies, the area also represents the heart of Oakland, and it houses most of the city's major landmarks, including Lake Merritt, downtown, Jack London Square, city Hall, city Center, the Alameda County courthouse, the Oakland Museum and the Kaiser Convention Center. The San Antonio area—formerly the town of Brooklyn—was annexed into the city in 1872; Fruitvale was annexed in 1909. Ethnically, these two districts are remarkably diverse: according to the 1990 census, in only three of the area's 18 census tracts did any single ethnic group comprises more than 50 percent of the population. For the Central/Chinatown planning area, the general plan predicts vigorous growth in both population and employment (14 and 31 percent, respectively), and a strong shift in employment from the manufacturing and wholesale sectors to retail and services. For the San Antonio, Fruitvale and Lower Hills area, the general plan

predicts only modest growth in both population and employment (six and three percent, respectively).

Central Oakland is especially susceptible to hazardous materials exposure, a variety of seismic hazards, structural hazards and storm-induced flooding (see Figure 7.2). The 94601 zip code—which is almost synonymous with Fruitvale—has the largest number of P1-level facilities under the CalARP program, of facilities with aboveground storage tanks and of facilities with above-threshold emissions of toxic air contaminants; the second-largest number of state Superfund sites; and the third-largest number of facilities with underground storage tanks. Like West Oakland, Fruitvale must be considered to have a much higher-than-average risk of exposure to hazardous materials and of industrial fires compared to the rest of the city. The fact that the area is traversed by I-880 makes it especially susceptible to transportation-related accidents involving explosions, spills and gaseous releases of hazardous materials. Moreover, lower Fruitvale has striking incompatibilities between heavy-industrial and residential land uses. The area's underlying geology also makes it prone to a variety of seismic hazards, including strong ground shaking, liquefaction and settlement. Structural fires are a concern in downtown due to the concentration in the area of highrises, large assembly spaces, and older buildings with little physical separation among them; damage to structures from earthquake-induced ground shaking is also a concern due to the many unreinforced masonry buildings in the area. Storm-induced flooding, while much less of a threat in recent decades (thanks to flood-control engineering measures), still has the potential to affect areas surrounding Lake Merritt. Finally, collapse of the Central Reservoir would inundate a large portion of the planning area.



East Oakland This is essentially the same planning area as that identified by the same name in the land use and transportation element (with the exception of the area generally above MacArthur Boulevard, which the safety element has classified as part of the Lower Hills; see below). The boundaries of East Oakland are I-580/MacArthur Boulevard to the northeast, the city of San Leandro to the southeast, the estuary's tidal channel and San Leandro Bay to the southwest, and High Street to the northwest (see Figure 7.3). The area includes the neighborhoods of Melrose, Seminary, Elmhurst and Brookfield Village, and also the Coliseum area and Oakland International Airport.

Most of East Oakland was originally developed in the first half of the last century. Development declined markedly after World War II, and for the last several decades the area has struggled to retain and attract businesses and to rehabilitiate its aging housing

stock. Nevertheless, East Oakland has some of the city's—if not the Bay Area's—top assets, including Oakland International Airport, professional sports and other entertainment at the Coliseum complex, protected open space and recreational opportunities along the waterfront, and easy access to freeways and BART. According to the general plan, the population of East Oakland—including the area above MacArthur Boulevard—is approximately 105,000, and is expected to grow slowly through 2015, by just under 3.5 percent. The number of jobs in the area, however, is expected to soar (by almost 27 percent), especially in manufacturing and retail.

The main environmental hazards of concern in East Oakland are exposure to hazardous materials and a variety of seismic and flooding hazards. The 94601 zip code, which is burdened with facilities and sites involving hazardous materials (see above), spills into East Oakland; in addition, the 94621 zip code—which is centered on the Coliseum, and includes the airport—is tied for the largest number of sites on EPA's CERCLIS database of hazardous-waste sites; has the second-largest number of facilities with underground storage tanks; and the third-largest number of P1-level facilities under the CalARP program, of facilities with aboveground storage tanks, and of facilities with above-threshold emissions of toxic air contaminants. The San Leandro Street corridor, between High Street and the city of San Leandro, is one of the three parts of the city—the other two are lower Fruitvale and the West Clawson neighborhood in West Oakland—with the most serious incompatibilities between industrial and residential uses. Due to its underlying geology, parts of East Oakland—and especially the airport, much of which is built on fill—is susceptible to strong earthquake-induced ground shaking, liquefaction and settlement. Also, due to its low-lying elevation, East Oakland is vulnerable to a variety of flooding hazards: large swaths of area fall within the 500-year floodplain; pockets of land exist within the 100-year floodplain; much of the area would be inundated from failure of the Lake Chabot or Upper San Leandro dams or the Dunsmuir reservoir; and most of the area's shoreline falls within the tsunami run-up zone.

North Oakland Again, this is essentially the same planning area as that identified by the same name in Oakland's land use and transportation element. Its boundaries, roughly, are the city of Berkeley to the north, I-580 to the south, Mountain View Cemetery and the city of Piedmont to the east, and the city of Emeryville to the west (see Figure 7.4). Annexed to the city in 1897, this is a densely populated and largely residential area that includes the Claremont, Temescal and Rockridge districts; it has a population of approximately 48,000 people. North Oakland derives its land use form

from the main thoroughfares that radiate from downtown along historic streets and former streetcar routes: San Pablo Avenue, Martin Luther King, Jr. Way, Telegraph Avenue, College Avenue, Broadway and Piedmont Avenue (from west to east); also, more than other parts of the city, North Oakland experiences benefits and impacts from neighboring jurisdictions since the area abuts the cities of Emeryville, Berkeley and Piedmont. The Oakland general plan indicates low population and jobs growth for the area through 2015 (of between three and four percent for both), but predicts a marked shift in employment from manufacturing to retail.

From an environmental hazards perspective, North Oakland should be considered one of the safest areas of the city. The area skirts or avoids most of the city's primary environmental hazards, including the Hayward fault zone, the wildfire hazard area, areas of landslide potential and areas of filled soil. On the other hand, a large percentage of the area's land is susceptible to dam-failure inundation, mainly from the potential failure of the Lake Temescal dam but also from failure of the Claremont reservoir.

Lower Hills This area is bound by Highway 13/I-580 to the northeast, I-580/MacArthur Boulevard to the southwest, and the North Oakland neighborhoods of Rockridge and Temescal to the west (see Figure 7.5). This planning area does not have an equivalent in the land use and transportation element; rather, for purposes of this document and to reflect its distinct environmental hazards profile, it has been carved out of several land use and transportation areas. The Lower Hills area includes the neighborhoods of Trestle Glen, Oakmore and Dimond, and several large open spaces and institutional uses such as Mountain View Cemetery, Claremont Country Club, the Montclair golf course, Mills College and King Estates Park. The Lower Hills are significantly lower and less steep than the Upper Hills (see below), and are separated from each other by the Hayward fault.

The Lower Hills are conspicuously hazard-prone, and are at higher-than-average risk for wildland fires, landslides, fault rupture, ground shaking and infrastructure hazards resulting from earthquakes. Much of the area consists of sloping terrain, is blanketed by relatively dense vegetation and is developed with wooden structures, three factors that greatly increase the wildfire hazard. At the same time, the sloping terrain and the area's location beside the Hayward fault create a substantial landslide risk. Furthermore, the presence of the Hayward fault imposes significant hazards including fault rupture, strong or violent ground shaking, and disruption to the area's transportation and utility systems.

Upper Hills This is essentially the same planning area as the "North and South Hills" area in the land use and transportation element (with the exception of the area generally below Highway 13 north of Joaquin Miller Road, which the safety element has classified as part of the Lower Hills; see above). The area is bound, roughly, by unincorporated Contra Costa County and the open spaces of the East Bay Regional Park District (EBRPD) to the north and east, Highway 13/I-580 to the south and west, and the city of Berkeley to the west (see Figure 7.5). The Upper Hills includes the neighborhoods of Forest Park, Montclair, Piedmont Pines, Millsmont, Eastmont, Oak Knoll and Sheffield Village, and several large open spaces and institutional uses such as the undeveloped lands of UC Berkeley, Claremont Canyon Regional Preserve, Grizzly Peak Open Space, Joaquin Miller Park, Merritt College, Leona Heights Open Space Regional Preserve, Sequoyah Country Club, Knowland Park and the Lake Chabot golf course.

Along with the bay, estuary and Lake Merritt, the Upper Hills—substantially higher and steeper than the Lower Hills—are Oakland's defining natural feature. They provide a spectacular backdrop for the city and a divide between the city's urban areas and the greenbelt to the north and east formed by the EBRPD's system of open spaces and rural Contra Costa County. Most of the land in the area is zoned for residential or open space uses, and the area is known for its dramatic views, forested character, winding streets and hillside architecture. The area north of Joaquin Miller Road, perhaps more than any other part of the city, has a development pattern dictated by topography and natural features, and it is this area that was affected almost exclusively by the 1991 firestorm. The area south of Joaquin Miller Road is, in general, the city's most newly developed section and has the most suburban character and most of the city's vacant land. According to the general plan, the population of the Upper Hills—including the area below Highway 13 north of Joaquin Miller Road—is approximately 42,000, and is expected to grow by almost 15 percent through 2015. The area has the lowest number of jobs in the city—under 9,000—but that number is expected to increase by 20 percent, with most growth centered in the retail and services sectors.

The Upper Hills are exposed to the same hazards as the Lower Hills but to an even greater extent, in most cases. The wildfire hazard must be considered even greater in the Upper Hills due to the area's denser vegetation and steeper terrain, and its adjacency to the EBRPD's parks and open spaces. The landslide hazard, too, must be considered greater, since the Upper Hills are higher and steeper than the Lower Hills. Finally, the area's relative isolation makes it particularly vulnerable to the disruptive effects that an earthquake along the Hayward fault would have on the area's transportation and utility

systems, which could seriously compromise the ability of emergency personnel to respond to a disaster in the Upper Hills.