4.8 HYDROLOGY AND WATER QUALITY

This chapter describes the existing character of the Environmental Assessment (EA) Study Area related to hydrology and water quality. This chapter provides an evaluation of the potential environmental consequences of future development that could occur by adopting and implementing the proposed Housing Element Update, General Plan Consistency Update, and associated Zoning Ordinances amendments, together referred to as the "Plan Components." A summary of the relevant regulatory setting and existing conditions is followed by a discussion of Plan Components and cumulative impacts.

A. Regulatory Framework

This section summarizes key federal, State, and local regulations and programs related to water quality in the EA Study Area.

1. Federal Laws and Regulations

a. Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains.[1] FEMA also issues Flood Insurance Rate Maps (FIRMs) that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. The design standard for flood protection is established by FEMA. FEMA's minimum level of flood protection for new development is the 100-year flood event, also described as a flood that has a 1-in-100 chance of occurring in any given year.

Additionally, FEMA has developed requirements and procedures for evaluating earthen levee systems and mapping the areas affected by those systems.[2] Levee systems are evaluated for their ability to provide protection from 100-year flood events and the results of this evaluation are documented in the FEMA Levee Inventory System (FLIS). Levee systems must meet minimum freeboard standards and must be maintained according to an officially adopted maintenance plan. Other FEMA levee system evaluation criteria include structural design and interior drainage.

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[1] Federal Emergency Management Agency's Library, *National Flood Insurance Program Description*, http://www.fema.gov/library/resultSearchTitle.do;jsessionid=DD174A565E1F55952F9B72CE7EC2818C.Worker2Library, accessed on September 28, 2012.

[2] Federal Emergency Management Agency (FEMA), 2003. Guidelines and Specifications for Flood Hazard Mapping Partners, http://www.fema.gov/library/viewRecord.do?id=2206, accessed on September 26, 2012.

b. Clean Water Act

The United States (U.S.) Environmental Protection Agency (EPA) is the lead federal agency responsible for water quality management. The Clean Water Act (CWA, codified at 33 U.S.C. Sections 1251-1376) of 1972 is the primary federal law that governs and authorizes water quality control activities by the EPA, as well as the states. Various elements of the CWA address water quality, discussed below. Wetland protection elements, including permits to dredge or fill wetlands, are administered by the US Army Corps of Engineers under Section 404 of the CWA.

Under Section 401 of the CWA, an applicant for a Section 404 permit to discharge dredged or fill material into waters of the United States must first obtain a certificate from the appropriate State agency stating that the fill is consistent with the State's water quality standards and criteria. In California, the authority to either grant water quality certification or waive the requirement is delegated by the State Water Resources Control Board (SWRCB) to its nine Regional Water Quality Control Boards (RWQCBs).

Under federal law, the EPA has published water quality regulations under Volume 40 of the Code of Federal Regulations (40 CFR). Section 303 of the CWA requires states to adopt water quality standards for all surface waters of the United States. As defined by the CWA, water quality standards consist of two elements: (1) designated beneficial uses of the water body in question, and (2) criteria that protect the designated uses. Section 304(a) requires the EPA to publish advisory water quality criteria that accurately reflect the latest scientific knowledge on the kind and extent of all effects on health and welfare that may be expected from the presence of pollutants in water. Where multiple uses exist, water quality standards must protect the most sensitive use. In California, the EPA has designated the SWRCB and its RWQCBs with authority to identify beneficial uses and adopt applicable water quality objectives.

c. National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) permit program was established by the CWA to regulate municipal and industrial discharges to surface waters of the U.S. from their separate municipal storm sewer systems (MS4s). Federal NPDES permit regulations have been established for broad categories of discharges, including point-source municipal waste discharges and nonpoint-source stormwater runoff. NPDES permits generally identify effluent and receiving water limits on allowable concentrations and/or mass emissions of pollutants contained in the discharge; prohibitions on discharges not specifically allowed under the permit; and provisions that describe required actions by the discharger, including industrial pretreatment, pollution prevention, self-monitoring, and other activities.

2. State Laws and Regulations

a. Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act, codified in Division 7 of the California Water Code) of 1969 is California's statutory authority for the protection of water quality. Under the Act, the State must adopt water quality policies, plans, and objectives that protect the State's waters for the use and enjoyment of the people. Such "waters of the State" include streams, groundwater, isolated wetlands, and other bodies of water that are not under federal jurisdiction as "waters of the United States," (under the Clean Water Act). These waters include those which are not tributary to navigable waterways. The Act sets forth the obligations of the SWRCB and RWQCBs to adopt and periodically update water quality control plans (Basin Plans). Basin Plans are the regional water quality control plans required by both the CWA and Porter-Cologne Act in which beneficial uses, water quality objectives, and implementation programs are established for each of the nine regions in California.

This Act also requires waste dischargers to notify the RWQCBs of their activities through the filing of Reports of Waste Discharge (RWD) and authorizes the SWRCB and RWQCBs to issue and enforce waste discharge requirements (WDRs), NPDES permits, Section 401 water quality certifications, or other approvals.[3]

b. State Water Resources Control Board

In California, the SWRCB has broad authority over water quality control issues for the State. The SWRCB is responsible for developing statewide water quality policy and exercises the powers delegated to the State by the federal government under the CWA. Other State agencies with jurisdiction over water quality regulation in California include the California Department of Health Services (DHS) for drinking water regulations, the California Department of Pesticide Regulation, the California Department of Fish and Wildlife (CDFW), and the Office of Environmental Health and Hazard Assessment.

Regional authority for planning, permitting, and enforcement is delegated to the nine RWQCBs. The regional boards are required to formulate and adopt water quality control plans for all areas in the region and establish water quality objectives in the plans. The EA Study Area is within the jurisdiction of the San Francisco Bay RWQCB (Region 2).

[3] Porter-Cologne Water Quality Act's website. http://ceres.ca.gov/wetlands/permitting/Porter_summary.html, accessed on September 28, 2012.

The San Francisco Bay RWQCB adopted a Water Quality Control Plan for the San Francisco Bay Basin (the Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the Basin Plan.[4]

c. California Fish and Game Code

The CDFW protects streams, water bodies, and riparian corridors through the streambed alteration agreement process under Section 1601 to 1606 of the California Fish and Game Code. The Fish and Game Code stipulates that it is "unlawful to substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream or lake" without notifying the CDFW, incorporating necessary mitigation and obtaining a streambed alteration agreement. CDFW's jurisdiction extends to the top of banks and often includes the outer edge of riparian vegetation canopy cover.

d. State Water Resources Control Board Construction General Permit (99-08-DWQ)

Construction activities that disturb one or more acres of land that could impact hydrologic resources must comply with the requirements of the SWRCB Construction General Permit (99-08-DWQ). Under the terms of the permit, applicants must file Permit Registration Documents (PRDs) with the SWRCB prior to the start of construction. The PRDs include a Notice of Intent (NOI), risk assessment, site map, Storm Water Pollution Prevention Plan (SWPPP), annual fee, and a signed certification statement. The PRDs are now submitted electronically to the SWRCB via the SMARTS website. Applicants must also demonstrate conformance with applicable best management practices (BMPs) and prepare a SWPPP containing a site map that shows the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection, and discharge points, general topography both before and after construction, and drainage patterns across the project site. An updated Construction General Permit (2009-0009-DWQ), adopted on September 2, 2009 and effective July 1, 2010, requires tighter stormwater pollution prevention controls, including the imposition of more minimum BMPs and the development and implementation of Rain Event Action Plans for certain sites.

[4] San Francisco Bay RWQCB, 2007. *Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin*, http://www.swrcb.ca.gov/rwqcb2/basin_planning.shtml, accessed on September 28, 2012.

e. Water Conservation Act of 2009 (Senate Bill X7 7 (2009)[5]

New mandatory requirements, per state law (SB-X7 7), mandate the reduction of per capita water use and agricultural water use throughout the state by 20 percent by 2020.

f. State Updated Model Landscape Ordinance (Assembly Bill 1881 (2006)[6]

The updated Model Landscape Ordinance requires cities and counties to adopt landscape water conservation ordinances by January 31, 2010 or to adopt a different ordinance that is at least as effective in conserving water as the updated Model Ordinance (MO). The City adopted Ordinance No. 968, Water Efficient Landscaping Regulations, in 2010, and revised City Code 12.44, which is described below.

3. Local Regulations and Policies

a. San Francisco Bay Conservation and Development Commission

The California Coastal Commission carries out its mandate locally through the San Francisco Bay Area Conservation and Development Commission (BCDC). BCDC's jurisdiction on San Francisco Bay includes all sloughs, marshlands between mean high tide and 5 feet above mean sea level, tidelands, submerged lands, and land within 100 feet of the Bay shoreline. The precise boundary is determined by BCDC on request. For planning purposes, BCDC assumes that projects have a lifespan of at least 50 to 90 years.[7]

Since the issuance of the Governor's Executive Order S-13-08 on November 2008, BCDC has followed other Natural Resource Agencies in planning for two sea level rise scenarios: 16 inches by mid-century and 55 inches by the end of the century. In April 2009, BCDC published its report with maps indicating zones that could be flooded due to sea level rise and that were based on existing elevations.[8] In May 2011, BCDC published a revised draft of its proposed amendments to its master planning document, the *Bay Plan*. This received considerable public review and environmental review, and was adopted on October 6, 2011.[9,10] These amendments include revised findings and policies to adapt to the effects of sea level rise.

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[5] Department of Water Resources, Senate Bill SBX7-7 2009 Information, http://www.water.ca.gov/wateruse efficiency/sb7/, accessed on September 28, 2012.

[6] http://www.water.ca.gov/wateruseefficiency/landscapeordinance/, accessed on September 27, 2012.

[7] BCDC, 2011. *San Francisco Bay Plan.* Available online at: http://www.bcdc.ca.gov/laws_plans/plans/sfbay_ plan.shtml. Accessed September 25, 2012.

[8] BCDC, 2009. *Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline.*

[9] BCDC, 2011. *Staff Report, Revised Preliminary Recommendation and Environmental Assessment for Proposed Bay Plan Amendment No. 1-08 Concerning Climate Change.* (For Commission consideration on September 1, 2011.)

Several findings describe migration of the tidal marsh inland as a consequence of the sea level rise and the recommended adaptation. Finding o. in the new section on Climate Change states:

> *"Approaches for ensuring public safety in developed vulnerable shoreline areas through adaptive management strategies include but are not limited to: (1) protecting existing and planned appropriate infill development; (2) accommodating flooding by building or renovating structures or infrastructure systems that are resilient or adaptable over time; (3) discouraging permanent new development when adaptive management strategies cannot protect public safety; (4) allowing only new uses that can be removed or phased out if adaptive management strategies are not available as inundation threats increase; and (5) over time and where feasible and appropriate, removing existing development where public safety cannot otherwise be ensured..."*

b. San Mateo County Flood Control District

The San Mateo County Flood Control District is a Countywide Special District, created by State legislation, to provide a mechanism to finance flood control projects. The legislation requires that a flood control zone be formed over an entire watershed and a proposed funding source be determined before a flood control project is undertaken. Recent changes in the State Constitution require an election if a flood control zone is to be financed with property assessments or taxes. As part of the program, the National Flood Insurance Program defines floodplain and floodway boundaries that are shown on FIRMs.

c. San Mateo Countywide Stormwater Pollution Prevention Program

The San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP) involves a consortium of the 20 incorporated cities within San Mateo County. Many of STOPPP's activities are coordinated through the City/County Association of Governments of San Mateo County. This partnership also relies on each of the municipalities to implement local stormwater pollution prevention and control activities for its own local storm drain systems. The STOPPP Stormwater Management Plan (SWMP) describes measures for the prevention and control of stormwater pollution during the approximately 6-year period from April 2004 through June 2010. The SWMP serves as part of the basis of STOPPP's third NPDES municipal stormwater permit to be reissued by the Water Board. The NPDES permit system requires the SWMP to include performance standards for the following five different stormwater management

[10] BCDC, 2011. Resolution No. 11-08. Adoption of Bay Plan Amendment No. 1-08 Adding New Climate Change Findings and Policies to the Bay Plan; And Revising the Bay Plan Tidal Marsh and Tidal Flats; Safety of Fills; Protection of the Shoreline; and Public Access Findings and Policies. Adopted October 6, 2011. Online at: http://www.bcdc.ca.gov/proposed_bay_plan/10-01Resolution.pdf.

components: Municipal Maintenance, Industrial and Illicit Discharge Controls, Public Information and Participation, New Development and Construction Controls, and Watershed Assessment and Monitoring.

The SWMP, in conjunction with the reissued permit adopted by the Water Board, is designed to enable STOPPP to meet the requirements of the Clean Water Act. In addition to obtaining coverage under the State NPDES General Permit for construction activities, the potential development would also be subject to coverage under the STOPPP NPDES municipal stormwater permit, applicable to post-construction operations. The stormwater pollution prevention plan required of the potential future development would have to be consistent with the SWMP.

d. San Francisquito Creek Joint Powers Authority

The JPA is a governmental organization with a board of directors made up of the elected officials of the Cities of Palo Alto, Menlo Park, East Palo Alto, San Mateo County, and the Santa Clara Valley Water District. The agency was formed in 1999 with the objective of protecting properties along San Francisquito Creek from 100-year floods, stabilizing creek banks, as well as enhancing the natural habitat.[11] The JPA and United States Army Corps of Engineers (USACE) are planning for large-scale, comprehensive flood risk reduction. The JPA is responsible for planning, designing, and implementing projects, which include increasing channel capacity through dredging, reducing flood risk by building levees and floodwalls, as well as through reconnecting the creek to 14 acres of Baylands in Palo Alto city limits to serve as creek floodplain.[12] The JPA's projects are typically funded by local, state, and federal partners. Another finance mechanism is the San Mateo County Flood Control District, which implements Countywide Special District flood control projects for projects on San Francisquito Creek.

e. City of Menlo Park General Plan

The City of Menlo Park General Plan includes goals, policies, and actions that apply broadly to hydrology and water quality issues potentially affected by the Plan Components. Relevant policies are identified later in this chapter under Section D (Impact Discussion).

[11] San Francisquito Creek Joint Powers Authority 2012. About. Accessed November 13, 2012 from http://sfcjpa.org/web/about/agency-overview/.

[12] San Francisquito Creek Joint Powers Authority 2012. SF Bay to Highway 101, http://sfcjpa.org/web/projects/active/s.f.-bay-to-highway-101/, Accessed 11, 13, 2012.

f. City of Menlo Park Municipal Code Chapter 7.38, Water Conservation[13]

This chapter contains regulations and restrictions on water use in order to conserve water resources and eliminate wasteful water uses. Section 7.38.030 contains specific requirements, such as repairing broken plumbing, sprinkler, or irrigation systems, recycling water that was used for cooling, and prohibiting the use of a hose without a positive shut-off valve for washing cars, building structures, or hard-surface areas.

g. City of Menlo Park Municipal Code Chapter 7.42, Stormwater Management Program[14]

Chapter 7.42 of the Municipal Code is intended to protect and enhance the water quality in Menlo Park. This chapter includes regulations and restrictions related to pollutants in stormwater discharges and non-stormwater discharges, including spills, and dumping or disposal of materials. To reduce pollutants in stormwater, the City requires that new development or redevelopment projects use BMPs.

h. City of Menlo Park Municipal Code Chapter 12.42, Flood Damage Prevention[15]

This chapter contains standards for any construction projects in areas of special flood hazard and coastal high hazard areas. The City designates special flood hazard areas based on the Flood Insurance Study (FIS), FIRMs, and Flood Boundary and Floodway Maps (FBFMs). In these areas, the City requires using flood-resistant construction materials and utility equipment as well as construction methods that minimize flood damage.

Any construction projects within the special flood hazard area must obtain a development permit reviewed by the floodplain administrator prior to construction. A permit application should include plans showing the location and elevation of the project, proposed elevation of the 1-percent chance storm Base Flood Elevation (BFE) in relationship to the lowest floor of all structures, and a description of any watercourse that could be altered as a result of potential development. Variances may be issued for the repair, rehabilitation, or restoration of historic structures, and listed in the National Register of Historic Places or the State Inventory of Historic places.

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[13] City of Menlo Park, Municipal Code Chapter 7.38, Water Conservation, http://www.codepublishing.com/CA/menlopark/, accessed on September 27, 2012.

[14] City of Menlo Park, Municipal Code Chapter 7.42, Stormwater Management Program, http://www.codepublishing.com/CA/menlopark/, accessed on September 27, 2012.

[15] City of Menlo Park, Municipal Code Chapter 12.42, Flood Damage Prevention, http://www.codepublishing.com/CA/menlopark/, accessed on September 27, 2012.

i. City of Menlo Park Municipal Code Chapter 12.44, Water Efficient Landscaping[16]

This chapter establishes water-efficient landscaping standards to conserve water use on irrigation. The provisions of this chapter apply to landscaping projects that include irrigated landscape areas exceeding 2,500 square feet when these projects are associated with new water service, subdivision improvements, grading and drainage improvements, a new construction subject to a building permit, or building additions or modifications subject to grading and drainage plan approval.

Prior to construction, the applicant must submit a landscape project application and applicable fees for review and approval. The application should include project information, water budget calculations (if the applicant uses a water budget approach rather than complying with turf area options), an outdoor water use efficiency checklist, and landscape and irrigation system design plans. The landscape and irrigation designs must be prepared and signed by a certified or authorized professional. After construction and prior to final approval of the project, the applicant must submit a landscape audit report. The City also requires the applicant maintain landscape irrigation facilities and comply with the landscape and irrigation maintenance schedule requirements.

B. Existing Conditions

1. Physical Environment

This section describes the physical environment that affects drainage systems in Menlo Park, including the topography, watershed and creek system, and climate conditions.

a. Topography

Menlo Park stretches from 326 feet above sea level in the foothills of Jasper Ridge (part of the Santa Cruz Mountains) in the east, through the flatlands in the center of the valley, to sea level at the marshes and mudflats of San Francisco Bay in the north-northeast. The City's center is relatively flat, with slopes of approximately 0.5 to 0.8 percent. The higher, hilly portion of the City is southwest of the street Alameda de las Pulgas. The lower, flatter portion of the City is northeast of Alameda de las Pulgas.

[16] City of Menlo Park, Municipal Code Chapter 12.44, Water Efficient Landscaping, http://www.codepublishing.com/CA/menlopark/, accessed on September 27, 2012.

b. Watershed and Creek Systems

The City is located within the 50-square mile San Francisquito Creek watershed, which includes portions of both Santa Clara County and San Mateo County. The uppermost elevations of the watershed are west of Highway 35 (locally known as Skyline Boulevard), and its lowest points are in East Palo Alto where San Francisquito Creek empties into the San Francisco Bay. San Francisquito Creek forms the southern boundary of Menlo Park. The southernmost edge of the watershed is in the Los Trancos Regional Preserve near Palo Alto, and its northern most edge is Sweeny Ridge in the Golden Gate National Recreation Area.

Water flows west to east through natural creeks and streams and channelized waterways. In the undeveloped marshes, water flows through Flood Slough and Ravenswood Slough. In the urbanized portion of the EA Study Area, the main creek system is San Francisquito Creek. In general, the creek flows in a northeasterly direction, and ultimately drains into the San Francisco Bay. San Francisquito Creek flows through Menlo Park largely in its natural alignment, and it forms the southern boundary of the City limits. Riparian vegetation around the creek spans a 25- to 75-meter-wide space, depending on adjacent land use and topography, consisting primarily of willow, bay laurels, redwoods, alders, cottonwoods, dogwoods, valley oaks, and coast live oaks.[17]

c. Groundwater Aquifers

The City is situated above the Santa Clara Valley groundwater basin and San Mateo subbasin. The San Mateo subbasin is bounded by the Santa Cruz Mountains to the west-southwest, the Bay to the north-northeast, San Francisquito Creek to the south-southwest, and the Westside basin to the north-northwest. A relatively shallow water table aquifer overlies confined and semi-confined aquifers near the margins of the Bay, with most wells constructed to draw from the deeper portions. Recharge of the groundwater occurs through infiltration into streambeds and through percolation of rain on the valley floor. Well data from the California Department of Water Resources indicate that groundwater recharge in the EA Study Area increases from the hilly west to the flatter eastern portions of the City, and decreases with increasing depth.[18]

[17] Stanford University Habitat Conservation Plan, San Francisquito Creek Watershed. Accessed November 7, 2012 from: http://hcp.stanford.edu/sfcreek.html

[18] California Department of Water Resources, *California's Groundwater, Update 2003*, Bulletin 118, San Mateo Subbasin, February 27, 2004.

d. Climate

The EA Study Area experiences a coastal Mediterranean climate, which consists of long dry, relatively cool summers and wet, mild winters. The City receives approximately 15.5 inches of rain annually, primarily experienced from the five-month stretch between November and April.[19]

2. Water Quality

As previously discussed, the EA Study Area is within the San Francisquito Creek Watershed. More specifically, runoff from development within Menlo Park will eventually discharge to San Francisquito Creek, which ultimately discharges into South San Francisco Bay.

The beneficial uses of the surface water bodies in the EA Study Area have been designated in the Water Quality Control Plan for the San Francisco Bay Region (Basin Plan).[20] These potential and beneficial uses are summarized in Table 4.8-1.

TABLE 4.8-1 **DESIGNATED BENEFICIAL USES OF WATER BODIES IN MENLO PARK**

Water Body	Designated Beneficial Use
Surface Water	
South San Francisco Bay	COMM, EST, IND, MIGR, NAV, RARE, REC-1, REC-2, SHELL, SPWN, WILD
San Francisquito Creek	COLD, MIGR, SPWN, WARM, WILD, REC-1, REC-2
Groundwater	
Santa Clara Valley (San Mateo Subbasin)	MUN, PROC, IND, AGR (potential)

Source: San Francisco RWQCB, 2011. *Water Quality Control Plan for the San Francisco Bay Region*.

The potential and existing beneficial uses are as follows:

- AGR – Agricultural Supply
- COLD – Cold freshwater habitat

[19] Western Regional Climate Center, Palo Alto, California Monthly Total Precipitation (inches) (046646), www.wrcc.dri.edu, accessed September 29, 2011.

[20] San Francisco Bay Area Regional Water Quality Control Board (RWQCB). *Water Quality Control Plan for San Francisco Bay Area.* Accessed January 14, 2013. http://www.waterboards.ca.gov/sanfranciscobay/basin_planning.shtml.

- COMM – Commercial and sport fishing
- EST – Estuarine habitat
- IND – Industrial service supply
- MIGR – Fish migration
- MUN – Municipal and domestic supply
- NAV – Navigation
- PROC – Industrial process supply
- RARE – Preservation of rare and endangered species
- REC-1 – Water contact recreation
- REC-2 – Non-contact water recreation
- SHELL – Shellfish harvesting
- SPWN – Fish spawning
- WARM – Warm freshwater habitat
- WILD – Wildlife habitat

In accordance with Section 303(d) of the Clean Water Act, the State must present USEPA with a list of impaired water bodies that do not meet water quality standards. Listed impaired water bodies within Menlo Park are presented in Table 4.8-2.

Once a water body has been placed on the 303(d) list of impaired waters, states are required to develop a Total Maximum Daily Load (TMDL) to address each pollutant causing impairment. A TMDL defines how much of a pollutant a water body can tolerate and still meet water quality standards. TMDLs have been approved by USEPA for diazinon in San Francisquito Creek and mercury and PCBs in South San Francisco Bay.

The Basin Plan also contains water quality criteria for groundwater. Menlo Park is within the San Mateo Plain Subbasin of the Santa Clara Valley Groundwater Basin. Groundwater in this subbasin is generally characterized as calcium magnesium calcium carbonate water and the mineral content is very "hard," averaging 471 mg/l of calcium carbonate.[21] Some wells have reported concentrations of nitrate-nitrogen that exceed USEPA maximum contaminant levels (MCLs).

[21] California Department of Water Resources (DWR). *California's Groundwater Bulletin 118, Basins and Subbasins of the San Francisco Bay Hydrologic Region.* Accessed on January 13, 2013 at http://www.water.ca.gov/groundwater/bulletin118/san_francisco_bay.cfm.

TABLE 4.8-2 **SECTION 303(D) LIST OF IMPAIRED WATER BODIES IN MENLO PARK**

Water Body	Pollutant	Potential Source	Status of TMDL
San Francisquito Creek	Diazinon	Urban runoff/storm sewers	Approved (2007)
	Sedimentation/siltation	Nonpoint source	Planned (2013)
	Trash	Illegal dumping; urban runoff/storm sewers	Planned (2021)
South San Francisco Bay	Chlordane	Nonpoint source	Planned (2013)
	DDT	Nonpoint source	Planned (2013)
	Dieldrin	Nonpoint source	Planned (2013)
	Dioxin compounds	Atmospheric deposition	Planned (2019)
	Invasive species	Ballast water	Planned (2019)
	Furan compounds	Atmospheric deposition	Planned (2019)
	Mercury	Industrial and municipal point sources; resource extraction; atmospheric deposition; natural sources; nonpoint sources	Approved (2008)
	PCBs	Unknown nonpoint sources	Approved (2010)
	Selenium	Domestic use of groundwater	Planned (2019)

Source: State Water Resources Control Board. *2010 Integrated Report, Clean Water Act, Section 303(d) List*, Accessed on January 13, 2013, http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml.

Groundwater contamination can result from releases of hazardous materials from underground storage tanks or historical industrial activities. There are numerous RWQCB or Department of Toxic Substance Control (DTSC) hazardous waste cleanup sites within Menlo Park.[22] However, it does not appear that any of the potential housing or infill sites are underlain by contaminated groundwater, as discussed in more detail in Chapter 4.6, Hazards and Hazardous Materials. If groundwater dewatering activities are required

[22] State Water Resources Control Board (SWRCB). *Geotracker Database.* Accessed on January 13, 2013 at http://geotracker.waterboards.ca.gov/.

as part of the construction efforts, a more detailed assessment of the potential for contaminated groundwater to be present is warranted.

3. Flood Hazards Areas

FEMA prepares maps of the 100-year flood hazard area of U.S. communities. Areas within the 100-year flood hazard area are subject to 100-year flood, which means that in any given year, the risk of flooding in the designated area is 1 percent. Maps are also available for 500-year floods, which mean that in any given year, the risk of flooding in the designated area is 0.2 percent.

In some locations, FEMA also provides a measurement of base flood elevation for the 100-year flood, which is the minimum height of the flood waters during a 100-year event; base flood elevation is reported in feet above sea level. Depth of flooding is determined by subtracting the land's height above sea level from the base flood elevation. Areas within the 100-year flood hazard area that are financed by Federally-backed mortgages are subject to mandatory federal insurance requirements and building standards to reduce flood damage.

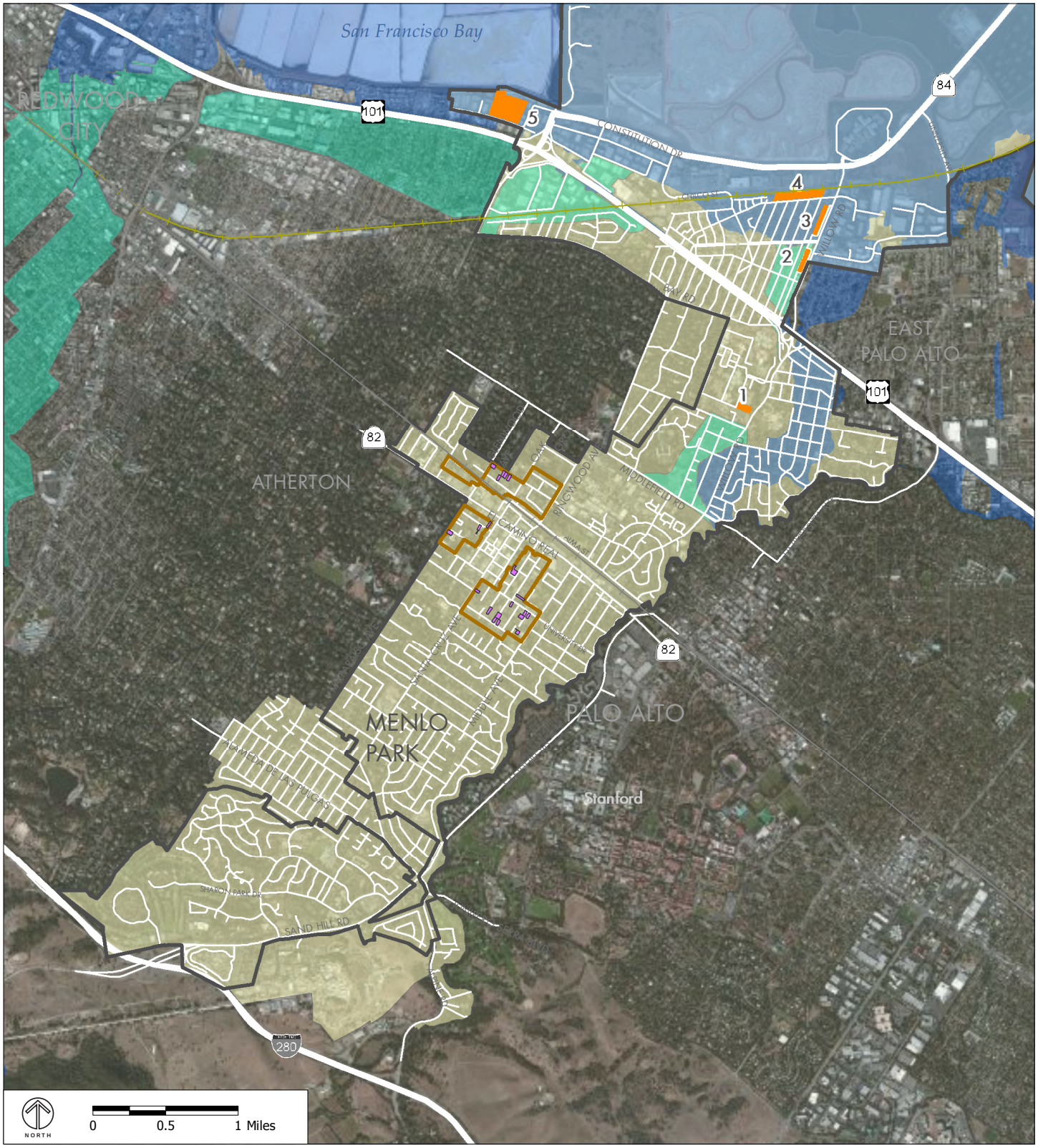
The northernmost portion of Menlo Park, including much of the area between Constitution Drive and Highway 101, is within the 100-year floodplain subject to tidal flooding from San Francisco Bay.[23] In addition, portions of Menlo Park between Middlefield Road and State Route 101 are within the 100-year floodplain due to overflow from San Francisquito Creek.[24]

There also are three smaller areas of Menlo Park that are subject to 500-year flood hazards. These are areas 1) northwest of San Francisquito Creek between Middlefield Road and Elm Street to approximately 400 feet west of Santa Monica Avenue, 2) south of the State Route 101 and Marsh Road interchange to approximately 450 feet south of the rail line, and 3) the area bounded by Ivy Drive to the north, Willow Road to the east, State Route 101 to the south, and Sevier Avenues to the east.

A map of the locations within Menlo Park that are within the 100-year and 500-year floodplain is shown on Figure 4.8-1. Only three of the potential housing sites are within the Special Flood Hazard Area (SFHA)

[23] Federal Emergency Management Agency (FEMA). Various *FIRM Maps Including 06081C0306E to 06081C309E. Accessed on January 16, 2013, http://map1.msc.fema.gov/.*

[24] San Francisquito Creek Joint Powers Authority (SFCJPA). *San Francisquito Creek Floodplain Mapping – 100-year Fluvial Flood Inundation Map.* Accessed on January 16, 2013 at http://sfcjpa.ehclients.com/documents/Corps_of_Engineers_100-year_floodplain_map.pdf.



Source: City of Menlo Park; The Planning Center | DC&E 2012; ESRI 2010; FEMA October 2012.

FEMA Special Flood Hazard Areas

- 100 Year Floodplain
- 500 Year Floodplain
- Lots with Additional Housing Unit Potential
- Infill Areas around Downtown
- Potential Sites to be Studied for Rezoning to Higher Density
- City Limits
- Sphere of Influence

FIGURE 4.8-1

FEMA SPECIAL FLOOD HAZARD AREAS

100-year floodplain: housing Sites 3, 4 and 5. Housing Site 2 (MidPen's Gateway Apartments at the 1200 block of Willow Road) is within the 500-year floodplain. Site 1 (Veterans Affairs Campus) is not within a 100-year or 500-year floodplain.

The San Francisquito Creek Joint Powers Authority (SFCJPA) in conjunction with the U.S. Army Corps of Engineers and the Santa Clara Valley Water District, are implementing improvements to provide 100-year flood protection for flood-prone reaches of San Francisquito Creek both upstream and downstream from State Route 101.[25] The goal is to eliminate the need for more than 5,400 properties to contribute to the National Flood Insurance Program because of overflows from San Francisquito Creek and San Francisco Bay tides. The SFCJPA is also working with CalTrans to replace the State Route 101 crossing over the creek to improve traffic flow and also increase the creek's capacity to accommodate the 100-year storm event. The construction of this project is scheduled to begin in 2014.[26]

The first portion of the San Francisquito Creek improvement project, which includes the section from San Francisco Bay to State Route 101, is scheduled to begin later this year; the Final EIR was completed in October 2012. The project will reduce flood risks along a flood-prone reach of the creek downstream of State Route 101 and will reduce flood risks from Bay tides and 50 years of future sea level rise. The following tasks will be completed:[27]

- Widen the creek to convey a 100-year storm flow, coupled with a 100-year tide and 25 inches of sea level rise.
- Excavate sediment that has built up over several decades and replace it with a marsh plan.
- Remove an abandoned levee to allow high creek flows into the Palo Alto Baylands south of the creek, thus reinstating a natural connection to the Bay for the first time in over 75 years.
- Construct floodwalls aligned to CalTrans' State Route 101 bridge over the creek in the area confined by homes and businesses.

[25] San Francisquito Creek Joint Powers Authority. *Projects Overview*. Accessed January 17, 2013 at http://sfcjpa.org/web/projects/projects-overview/.

[26] San Francisquito Creek Joint Powers Authority. *Projects Overview*. Accessed January 17, 2013 at http://sfcjpa.org/web/projects/projects-overview/.

[27] San Francisquito Creek Joint Powers Authority. *Projects Overview*. Accessed January 17, 2013 at http://sfcjpa.org/web/projects/projects-overview/.

Cities and unincorporated communities in San Mateo County, including Menlo Park, generate runoff that flows into the Bayfront Canal via the Atherton Channel and the six other drainage basins. Historically, flooding has occurred in the neighborhoods near the Bayfront Canal and Atherton Channel, particularly during storms that coincide with high tides.[28] This includes the vicinity of potential housing Site 5 (Haven Avenue). As configured as of 2013, the Bayfront Canal and Atherton Channel do not have enough detention capacity to prevent flooding in low lying areas. In addition, during storms that coincide with high tides, the Canal and Channel cannot discharge sufficient stormwater flows to the Bay because of tide gate limitations.

The Bayfront Canal Flood Management and Habitat Restoration Project will route flood flows from the Bayfront Canal and Atherton Channel into two of the managed ponds of the Ravenswood Pond Complex and the South Bay Salt Ponds Restoration project, the largest tidal wetland restoration project on the West Coast. When complete, this project will restore 15,100 acres of industrial salt ponds to tidal wetlands and other habitats and help mitigate the flooding problem.[29] High flows from the proposed configuration of the Canal will bypass around the Flood Slough tide gate and be directed into ponds to simultaneously mitigate widespread flooding in the Atherton Channel neighborhood and facilitate the development of a seasonal wetlands habitat. The Bayfront Canal Flood Management and Habitat Restoration Project is projected to be under construction in 2016.[30]

The City's storm drain system consists of 17 individual systems that serve 17 drainage areas, according to a study conducted in 2003 by BKF Engineers.[31] The area north of Middlefield Road drains to the Bay through either the Belle Haven Storm Drain system or through the City of East Palo Alto storm drain lines. The area south of Middlefield Road drains to either Atherton Channel on the northwest or San Francisquito Creek on the southeast. Significant portions of the system are not capable of providing

[28] Bay Area Integrated Regional Water Management Plan, 2013. Bayfront Canal Flood Management and Habitat Restoration Project. Accessed March 25, 2013 at http://bairwmp.org/projects/bayfront-canal-flood-management-and-habitat-restoration-project.

[29] Bay Area Integrated Regional Water Management Plan, 2013. Bayfront Canal Flood Management and Habitat Restoration Project. Accessed March 25, 2013 at http://bairwmp.org/projects/bayfront-canal-flood-management-and-habitat-restoration-project.

[30] City of Redwood City, XX, Stormwater Flood Management Grant Proposal. Accessed March 25, 2013 at http://wwwdwr.water.ca.gov/irwm/grants/docs/Archives/Prop1E/Submitted_Applications/P1E_Round1_SWFM/City%20of%20Redwood%20City/Att3_SWF_WorkPlan_1of1.pdf, page 3-10.

[31] BKF Engineers, 2003. *City-Wide Storm Drainage Study*.

conveyance of a 10-year storm event.[32] Common issues include undersized storm drain lines, bubble-up storm drain systems, and areas without storm drains. The City is currently conducting a study evaluating current deficiencies in the storm system design and limited flow capacity along Middlefield Road, and proposing alternatives to reduce flooding.[33]

4. Sea Level Rise

California Executive Order S-13-2008 states that all state agencies planning construction projects in areas vulnerable to sea level rise must consider a range of sea level rise scenarios for the years 2050 and 2100 to assess project vulnerability and to the extent feasible, reduce expected risks to sea level rise.[34] The Governor of California's Delta Vision Blue Ribbon Task Force adopted a sea level rise of 55 inches by 2100 for planning purposes. However, the San Francisco BCDC in the latest amendment to the Bay Plan (October, 2011), added new climate change findings and policies and has revised the 2100 sea level rise from 55 inches to up to 69 inches.[35] The BCDC has jurisdiction to regulate new development within 100 feet inland from the Bay shoreline. The existing BCDC policy is to require all projects within their jurisdiction to be built above the highest estimated tide and wave run up levels for the life of the project.[36]

Different scenarios and models used to predict sea level rise result in different estimates in the magnitude of sea level rise. Most shoreline damage from flooding will occur as a result of storm activity in combination with higher sea levels. The key factors that contribute to coastal flooding include high tides, storm surge, high waves, and high runoff rates from rivers and creeks.[37]

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[32] BKF Engineers, 2003. *City-Wide Storm Drainage Study*.

[33] City of Menlo Park, Public Works Department. *Middlefield Road Storm Drain Study.* Accessed January 17, 2013 at http://www.menlopark.org/departments/pwk/cip/.

[34] State of California. *Executive Order S-13-08.* Accessed on January 17, 2013 at http://gov.ca.gov/news.php?id=11036.

[35] San Francisco Bay Conservation and Development Commission (BCDC). *Resolution No. 11-08: Adoption of Bay Plan Amendment Adding New Climate Change Findings and Policies to the Bay Plan.* Accessed on January 17, 2013 at http://www.bcdc.ca.gov/proposed_bay_plan/10-01Resolution.pdf.

[36] San Francisco BCDC, 2011. *Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline.*

[37] San Francisco BCDC, 2011. *Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline.*

The Association of Bay Area Governments (ABAG) has produced a sea level rise scenario map for long range planning.[38] Figure 4.8-2 shows the projected sea level rise for the City of Menlo Park. The map indicates that four of the housing sites (Sites 2, 3, 4 and 5) are within the area vulnerable to a projected sea level rise of 55 inches. The impacted area extends just south of Ivy Drive.

5. Dam Failure Inundation

Several reservoirs in the area present the remote risk of downstream inundation in the event of a dam failure as the result of an earthquake or other catastrophic event. The California Emergency Management Agency has directed dam operators to delineate areas likely to be inundated in the event of a catastrophic dam failure.[39] According to the ABAG online dam failure inundation maps, portions of Menlo Park are within the Searsville and Searsville/Felt dam inundation zones.[40] Figure 4.8-3 shows the dam inundation zones from these dams. A small portion of one of the infill areas around downtown are on the edge of the dam inundation zone; none of the potential housing sites are within the dam inundation zones.

6. Seiche, Tsunami, and Mudflows

A tsunami is a large tidal wave generated by an earthquake, landslide, or volcanic eruption. Seiches are waves that oscillate in enclosed water bodies, such as reservoirs, lakes, ponds, or semi-enclosed bodies of water such as San Francisco Bay. Seiches may be triggered by moderate or large submarine earthquakes, or sometimes by large onshore earthquakes.

According to the CalEMA tsunami inundation map for emergency planning, Redwood Point Quadrangle, only the most northern portion of Menlo Park that consists mainly of sloughs and undeveloped land is within the tsunami inundation zone.[41] As shown on Figure 4.8-4, all of the potential housing sites and infill areas around downtown are outside of the tsunami inundation zone.

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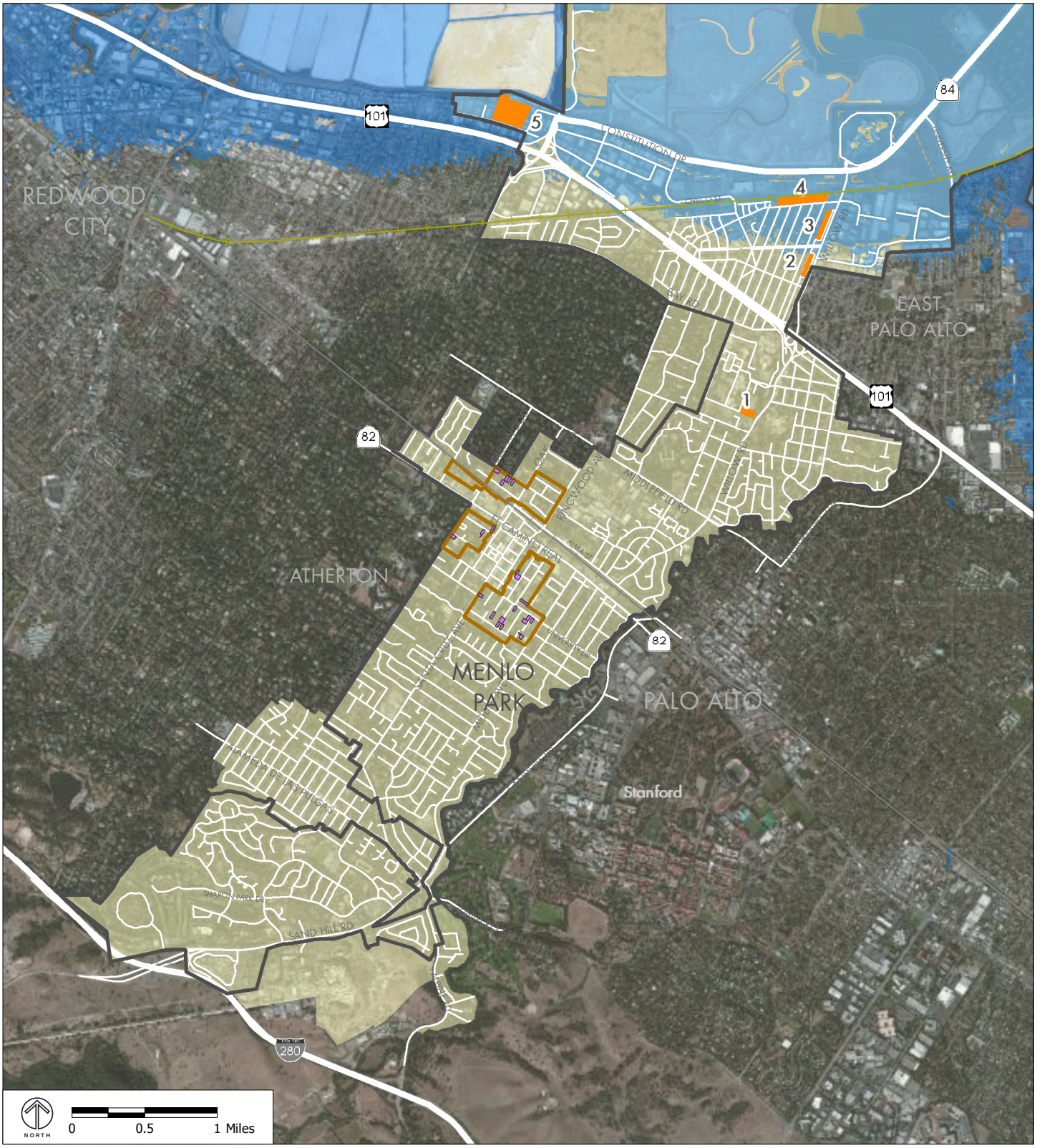
[38] Association of Bay Area Governments (ABAG). *Sea Level Rise Scenario Map for Long Range Planning.* Accessed for January 17, 2013 at http://quake.abag.ca.gov/searise/.

[39] California Emergency Management Agency (CalEMA). *Dam Inundation Mapping Regulations.* Accessed on January 17, 2013 at http://www.calema.ca.gov/hazardmitigation/pages/dam-inundation-program.aspx.

[40] Association of Bay Area Governments (ABAG). *Dam Failure Inundation Maps.* Accessed on January 17, 2013 at http://quake.abag.ca.gov/dam-failure/.

[41] CalEMA, 2009. *Tsunami Inundation Map for Emergency Planning, State of California – County of San Mateo, Redwood Point Quadrangle, Palo Alto Quadrangle.*

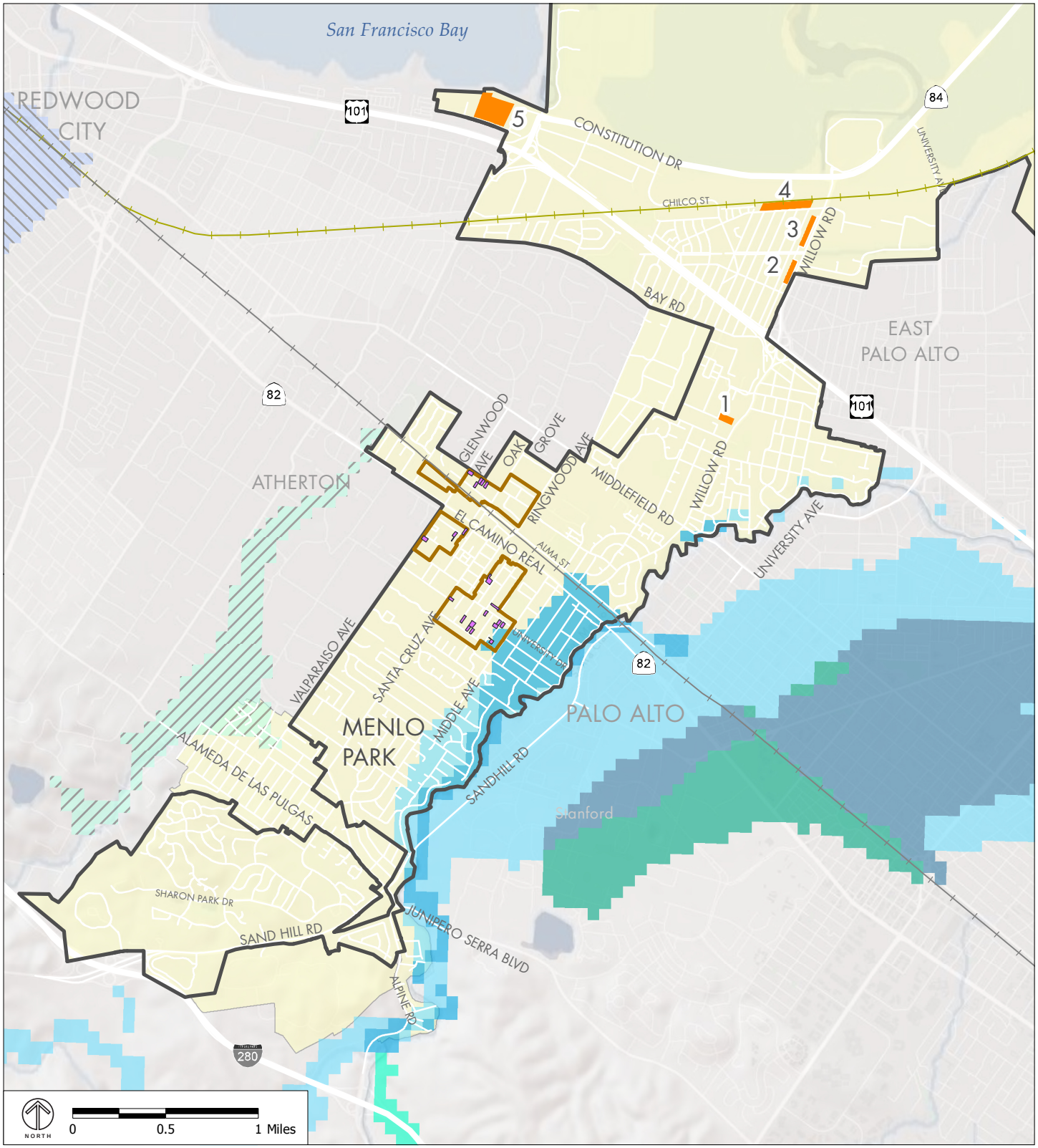


Source: City of Menlo Park; The Planning Center | DC&E 2012; ESRI 2010; USGS 2010.

- Area Potentially Exposed to an Approximate 55-inch Sea Level Rise
- Lots with Additional Housing Unit Potential
- Infill Areas around Downtown
- Potential Sites to be Studied for Rezoning to Higher Density
- City Limits
- Sphere of Influence

FIGURE 4.8-2

SEA LEVEL RISE



Source: City of Menlo Park; The Planning Center | DC&E 2012; ESRI 2010; ABAG 1995.

Dam Failure Inundation Areas

- BEAR GULCH
- FELT
- LAGUNITA
- LOWER EMERALD
- SEARSVILLE
- SEARSVILLE / FELT
- SEARSVILLE / LAGUNIT

- Lots with Additional Housing Unit Potential
- Potential Sites to be Studied for Rezoning to Higher Density
- Infill Areas around Downtown
- City Limits
- Sphere of Influence

FIGURE 4.8-3

DAM FAILURE INUNDATION ZONES

Source: City of Menlo Park; The Planning Center | DC&E 2012; ESRI 2010; CalEMA, CCGS, USC 2009.

Tusnami Inundation Zone
Lots with Additional Housing Unit Potential
Infill Areas around Downtown
Potential Sites to be Studied for Rezoning to Higher Density
City Limits
Sphere of Influence

FIGURE 4.8-4

TSUNAMI INUNDATION ZONE

Because there are no large bodies of water, such as reservoirs or lakes, within Menlo Park and only a very small portion of the City is within the tsunami inundation zone, there is no risk of seiches impacting the City or potential housing sites.

Mud and debris flows are mass movements of dirt and debris that occur after intense rainfall, earthquakes, and severe wildfires. The speed of a slide depends on the amount of precipitation, steepness of the slope, and alternate freezing and thawing of the ground. The majority of Menlo Park is relatively flat and the City is outside of the impacted zones for earthquake-induced landslides or rainfall-induced landslides.[42] Therefore, there is no expectation of mudflows or debris slides to occur within Menlo Park or the potential housing/infill sites.

C. Standards of Significance

The Plan Components would have a significant impact with regard to hydrology if they would:

1. Violate any water quality standards or discharge requirements.
2. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
3. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the amount of surface runoff in a manner which would result in substantial erosion, siltation, or flooding on- or off-site.
4. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
5. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, or place within a 100-year flood hazard area structures which would impede or redirect flood flows.

[42] Association of Bay Area Governments (ABAG). *Landslide Maps and Information: Earthquake Induced Landslides and Rainfall Induced Landslides.* Accessed on January 17, 2013 at http://quake.abag.ca.gov/landslides/.

6. Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of a levee or dam.
7. Expose people or structures to a significant risk of inundation by seiche, tsunami, or mudflow.

D. Impact Discussion

1. Violate any water quality standards or discharge requirements.

Development or redevelopment that is planned as part of the Plan Components could affect drainage patterns and increase the overall amount of impervious surfaces, thus creating changes to stormwater flows and water quality. Increasing the total area of impervious surfaces can result in a greater potential to introduce pollutants to receiving waters. Urban runoff can carry a variety of pollutants, such as oil and grease, metals, sediments, and pesticide residues from roadways, parking lots, rooftops, landscaped areas and deposit them into an adjacent waterway via the storm drain system. New construction could also result in the degradation of water quality with the clearing and grading of sites, releasing sediment, oil and greases, and other chemicals to nearby water bodies. However, future housing permitted by the Plan Components will be located on underutilized, infill sites, all of which have already been developed and currently have a high percentage of impervious surfaces.

Water quality in stormwater runoff is regulated locally by the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP), which include the C.3 provisions set by the San Francisco Bay RWQCB. Adherence to these regulations requires new development or redevelopment projects to incorporate treatment measures, an agreement to maintain them, and other appropriate source control and site design features that reduce pollutants in runoff to the maximum extent practicable. Many of the requirements consider Low Impact Development (LID) practices such as the use of onsite infiltration through landscaping and vegetated swales that reduce pollutant loading. Incorporation of these measures can even improve on existing conditions.

In addition, the potential housing will be required to comply with the NPDES Permit and implementation of the construction SWPPP that require the incorporation of BMPs to control sedimentation, erosion, and hazardous materials contamination of runoff during construction. Additionally, the City of Menlo Park Public Works Department requires development or redevelopment projects that replace or introduce more than 10,000 square feet of impervious surfaces to prepare a Hydrology Report that requires site design

measures to maximize pervious areas, source control measures to keep pollutants out of stormwater, use of construction BMPs, and post construction treatment measures.

The following goals and policies would ensure potential impacts to water quality would not occur with the implementation of the potential future development.

a. Current General Plan Land Use and Circulation Element

- Policy I-G-10: Extensive landscaping should be included in public and private development, including greater landscaping in large parking areas. Where appropriate, the City shall encourage placement of a portion of the required parking in landscape reserve until such time as the parking is needed. Plant material selection and landscape and irrigation design shall adhere to the City's Water Efficient Landscaping Ordinance.
- Policy I-A-3: Quality design and usable open space shall be encouraged in the design of all new residential developments.

While the Plan Components do promote new construction of housing units to meet the projected housing demand, it does not contain any policies that would directly or indirectly result in violations of water quality standards. Therefore, implementation of the Plan Component would have a *less-than-significant* impact on water quality.

2. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

Future residential development would result in an increase in impervious surfaces and the potential diversion of groundwater to surface water if short-term construction dewatering is required. Some areas of the EA Study Area have groundwater levels of only 5 to 10 feet below ground surface (bgs). These activities would result in a decrease in groundwater recharge to the San Mateo Groundwater Subbasin for which beneficial uses have been established by the San Francisco Bay Basin Plan.

However, the housing sites are very small in size relative to the size of the San Francisquito Creek Watershed and the San Mateo Groundwater Subbasin. In addition, implementation of low impact development (LID) guidelines that promote the use of permeable paving materials and on-site infiltration will increase the potential for groundwater recharge. Most of the water that supplies the EA Study Area is

obtained from the San Francisco Public Utilities Commission (SFPUC) stored in the Hetch-Hetchy Reservoir, which is surface water. Only a small amount of connections are served with local groundwater by the O'Connor Tract Co-operative Water Company that services parts of Menlo Park and East Palo Alto.

The use of site design features required by the SMCWPPP and the City of Menlo Park such as vegetated swales and landscaping will reduce the impact of increased impervious surfaces on groundwater recharge. Therefore, implementation of the Plan Components will have a *less-than-significant* impact with respect to groundwater supplies or groundwater recharge.

3. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the amount of surface runoff in a manner which would result in substantial erosion, siltation, or flooding on- or off-site.

New construction would involve construction and grading activities that may alter existing drainage patterns or could result in erosion or downstream sedimentation. However, none of the future development would require alteration of the course of an existing stream or river and the parcels are not located in Stream Conservation Areas (SCAs). Most of the future development sites are already developed or paved and new development on these sites would not create a substantial increase in the amount of impervious surfaces.

The new development or redevelopment that is planned for as part of the Plan Components would be subject to the NPDES construction permit requirements, including preparation of a SWPPP. In addition, the City's Municipal Code (Chapter 7.42, Storm Water Management Program), which requires preparation of a Grading and Drainage Plan and incorporation of erosion and sediment controls during construction, will further reduce the potential for substantial erosion or siltation and will ensure that runoff from the site is protective of the beneficial uses of receiving waters. Once constructed, the requirements for new development or redevelopment will include source control measures and site design measures that address stormwater runoff and would reduce the potential for erosion or siltation.

Changes in existing drainage patterns could increase the rate and/or amount of stormwater runoff, contributing to on-site or off-site flooding. However, the City of Menlo Park requires that runoff rates after project completion shall not exceed pre-project levels. Any increase in peak flow rates shall be handled on-site by retention to treat excess flow for the 10-year storm event. Any retained on-site stormwater would eventually be routed to existing storm drains. The Grading and Drainage Plans for each project would be reviewed by the City to ensure that on-site drainage, LID features, and retention basins are

adequate to prevent on-site or off-site flooding. As a result of implementation of these measures, the Plan Components would have a *less-than-significant* impact with respect to on-site or off-site erosion or flooding.

4. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

As discussed previously under Section D.3, an increase in impervious surfaces with development of the housing sites could result in an increase in stormwater runoff which could exceed the capacity of existing or planned stormwater drainage systems. Under existing conditions, portions of the City's storm drainage systems are not capable of containing the runoff from 10-year storm events.[43]

However, each of the housing sites involve parcels that have been developed and are already covered with a significant percentage of impervious surfaces. Therefore, post-development runoff rates should not be significantly different than pre-development rates. In addition, implementation of LID design guidelines and engineering review of drainage calculations and development plans by the Menlo Park Public Works Department would ensure that there are no significant increases in peak flow rates or runoff volumes. The City requires detention of stormwater runoff such that discharges do not exceed existing flow rates.

Development consistent with the Plan Components would not require significant expansions of the existing stormwater drainage infrastructure, because the majority of sites would be either infill projects or would be located within existing storm drainage systems. Because the City requires no net increase in stormwater flow rates, impacts associated with future development runoff would be *less than significant.*

5. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, or place within a 100-year flood hazard area structures which would impede or redirect flood flows.

Implementation of the Plan Components could result in the development of residential structures in existing FEMA-designated 100-year Special Flood Hazard Areas (SFHAs) or future zones of tidal inundation resulting from predicted mid-century sea level rise. As shown on Figure 4.8-1, the Plan Components would place future housing within the SFHA. The City of Menlo Park and San Mateo County have adopted local standards for construction in floodplain areas.[44]

[43] BKF Engineers, 2003. *City-Wide Storm Drainage Study, City of Menlo Park.*

[44] City of Menlo Park, Municipal Code Chapter 12.42, Flood Damage Prevention.

Future development within the 100-year flood zone would require the placement of fill to elevate structures above the 100-year floodplain elevation. In order for the future development to be considered outside of the floodplain and no longer subject to special flood hazard requirements, the applicant would have to submit an application to FEMA for a Letter of Map Revision – Fill (LOMR-F) after the fill has been placed. After FEMA has revised the FIRM to show that the future development is now outside of the SFHA, the City would no longer be required to apply the minimum NFIP floodplain management standards to structures built on the land and the mandatory flood insurance requirements would no longer apply. However, as part of its floodplain management strategy, to reduce possible loss of life and property in the event of a flood, the City would encourage compliance with as many of the standards as financially feasible.

Construction within SFHAs is governed by the City's Municipal Code Chapter 12, Section 12.42.51, Standards of Construction, which sets forth standards for development that would minimize flood hazard risks, including anchoring and flood-proofing; limitations on use for structures below the base flood elevation; use of materials and utility equipment resistant to flood damage; the requirement that electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities be designed and/or located to prevent water from entering or accumulating within the components during flood conditions; and the requirement that all new and replacement water supply and sanitary sewage systems be designed to minimize or eliminate infiltration of floodwaters into the system and discharge from systems into floodwaters. Compliance with these City Municipal Code requirements would reduce potential flood hazards to *less-than-significant* levels.

As noted in Section B.4, BCDC published sea level rise inundation maps for low-lying areas within San Francisco Bay. Four of the five potential housing Sites (2, 3, 4, and 5) are within the area vulnerable to a projected sea level rise of 55 inches, which is expected to occur by the year 2100. These tidal inundation predictions by BCDC relate to tidal flooding and storm surge, but do not incorporate coincident watershed flooding, which would increase flood hazards in areas affected by sea level rise and increases in tide levels. The individual and collective responses of Bay Area counties and municipalities to this flooding potential are in the early stages of development. However, the City of Menlo Park and San Mateo County are in the process of implementing policies and programs to adapt to the changing climate and to utilize estimates of sea level rise and incorporate data into mapping of areas subject to future inundation.

The following General Plan policies and programs would further reduce potential impacts due to flooding to a *less-than-significant* level.

a. Current General Plan Land Use and Circulation Element

- Policy I-H-10: The City shall continue to participate in the National Flood Insurance Program. To this end, the City shall work to keep its regulations in full compliance with standards established by the Federal Emergency Management Agency.

b. Amended General Plan Seismic Safety and Safety Element

- Policy S-1.5: New Habitable Structures. Require that all new habitable structures to incorporate adequate hazard mitigation measures to reduce identified risks from natural and human-caused hazards.
- Policy S-1.22: Flood Damage Prevention. Apply standards for any construction projects (new structures and existing structures proposed for substantial improvement) in areas of special flood hazard in accordance with FEMA and the Flood Damage Prevention Ordinance, including the use of flood-resistant construction materials and construction methods that minimize flood damage. Locate new essential public facilities outside of flood zones, such as City operations facilities, police and fire stations, and hospitals, to the extent feasible.
- Policy S-1.28: Sea Level Rise. Consider sea level rise in siting new facilities or residences within potentially affected areas.

6. Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of a levee or dam.

According to mapping compiled by ABAG, portions of Menlo Park are within the Searsville and Felt Dam inundation zones. As shown on Figure 4.8-3, a small portion of one of the infill areas around downtown is within the Searsville/Felt dam inundation zone. However, none of the potential housing sites are within the dam inundation zone. Dam inundation zones are based on the highly unlikely scenario of a total catastrophic dam failure occurring in a very short period of time. Existing state and local regulations address the potential for flood hazards as a result of dam failure. The Searsville and Felt dams are under the jurisdiction of the California Department of Water Resources, Division of Safety of Dams (DSOD), which conducts annual inspections and reviews all aspects of dam safety.

The inundation maps for the Searsville and Felt Dams were prepared in 1974.[45] Therefore, the currently mapped inundation zones may no longer be valid. The Searsville Dam has lost over 90 percent of its

[45] Stanford University, 1974. *Guide to the Flood (inundation) Studies for Searsville, Lagunita, and Felt Dams. SCM0331.*

original water storage capacity due to sedimentation and there are current proposals for its removal.[46] In addition, the following General Plan policies and programs would further reduce potential impacts due to dam inundation to a *less-than-significant* level.

a. Amended General Plan Seismic Safety and Safety Element

- Policy S-1.23: Potential Dam Inundation. Consider potential risks from dam inundation in the development approval process.
- Policy S-1.24: Dam Safety. Support programs by the California Division of Safety of Dams to retrofit or replace dams or to increase earthquake resistance of dams and mitigate impacts of dam failures. State efforts to inspect dams and evaluate dam safety requirements shall also be supported.
- Program S-1.L: Evaluate New Community Facilities Proposed in Dam Inundation Zones. Require that new community facilities located within dam inundation zones evaluate the potential for flooding and the impact on evacuation during the development approval process.

While none of the potential housing sites are within the dam inundation zone, as noted above a small portion of one of the infill areas around downtown is within the Searsville/Felt dam inundation zone and second units could be included in this zone; however, both of these locations would be developed on sites with existing housing. Nonetheless, the unlikely nature of dam failure, the regulatory oversight by the DSOD, and City policies to address the impact of flooding from dam inundation during the development process, the impact of flooding as a result of the failure of a dam or levee is considered to be *less than significant.*

7. Expose people or structures to a significant risk of inundation by seiche, tsunami, or mudflow.

According to the CalEMA tsunami inundation map for emergency planning, Redwood Point Quadrangle, only the most northern portion of Menlo Park that consists mainly of sloughs and undeveloped land, is within the tsunami inundation zone.[47] As shown on Figure 4.8-4, all of the potential housing sites and infill areas are outside of the tsunami inundation zone. Because there are no large bodies of water, such as reservoirs or lakes, within Menlo Park and only a very small portion of the City is within the tsunami inundation zone, there is no risk of tsunamis or seiches impacting the potential housing sites. In addition,

[46] Stanford University, 2007. *Searsville Lake: Position of the Jaspar Ridge Advisory Committee. – October 2007.*

[47] CalEMA, 2009. *Tsunami Inundation Map for Emergency Planning, State of California – County of San Mateo, Redwood Point Quadrangle, Palo Alto Quadrangle.*

the City is outside of the impacted zones for earthquake-induced landslides or rainfall-induced landslides.[48] Therefore, there is no expectation of mudflows or debris slides to occur within Menlo Park or at the potential housing sites. In addition, the following General Plan policies and programs would further reduce potential impacts due to tsunamis to a *less-than-significant* level.

a. Amended General Plan Seismic Safety and Safety Element

- Policy S-1.21: Flood and Tsunami Hazard Planning and Mapping. Consider the threat of flooding and tsunamis in planning and management practices to minimize risk to life, environment and property and maintain up-to-date tsunami hazard zones maps and flood maps as new information is provided by FEMA and other regional agencies. Modify land use plans in areas where tsunamis and flooding are hazards, and permit only uses that will sustain acceptable levels of damage and not endanger human lives in the event of inundation
- Policy S-1.28: Sea Level Rise. Consider sea level rise in siting new facilities or residences within potentially affected areas.

8. Cumulative Impacts

The geographic context used for the cumulative assessment of water quality and hydrology impacts is the San Francisquito Creek Watershed, which encompasses the entire EA Study Area. Cumulative impacts can occur when impacts that are significant or less than significant from a proposed project combine with similar impacts from other past, present, or reasonably foreseeable projects in a similar geographic area.

As discussed previously, the development of housing sites under the Plan Components would require conformance with State and local policies that would reduce hydrology and water quality impacts to *less-than-significant* levels. When applicable, any additional new development within the City would be subject, on a project-by-project basis, to independent CEQA review as well as policies in the Menlo Park General Plan, design guidelines, zoning codes, and other applicable City requirements that reduce impacts related to hydrology and water quality. More specifically, potential changes related to stormwater quality, stormwater flows, drainage, impervious surfaces, and flooding would be minimized via the implementation of stormwater control measures, retention, infiltration, and LID measures, and review by the City's Public Works Department to integrate measures to reduce potential flooding impacts.

[48] Association of Bay Area Governments (ABAG). *Landslide Maps and Information: Earthquake Induced Landslides and Rainfall Induced Landslides.* Accessed on January 17, 2013 at http://quake.abag.ca.gov/landslides/.

All cumulative projects would be subject to similar permit requirements and would be required to comply with City ordinances and General Plan policies, as well as numerous water quality regulations that control construction related and operational discharge of pollutants in stormwater. The water quality regulations implemented by the San Francisco Bay RWQCB take a basin-wide approach and consider water quality impairment in a regional context. For example, the NPDES Construction Permit ties receiving water limitations and basin plan objectives to terms and conditions of the permit, and the MS4 Permit works with all municipalities to manage stormwater systems to be collectively protective of water quality. For these reasons, impacts of residential development under the Plan Components on hydrology and water quality are not cumulatively considerable and the cumulative impact would be *less than significant.*

E. Impacts and Mitigation Measures

The future development under the Plan Components would not result in any significant hydrology or water quality impacts; therefore, no mitigation measures are necessary.