Volume 1 - EIR

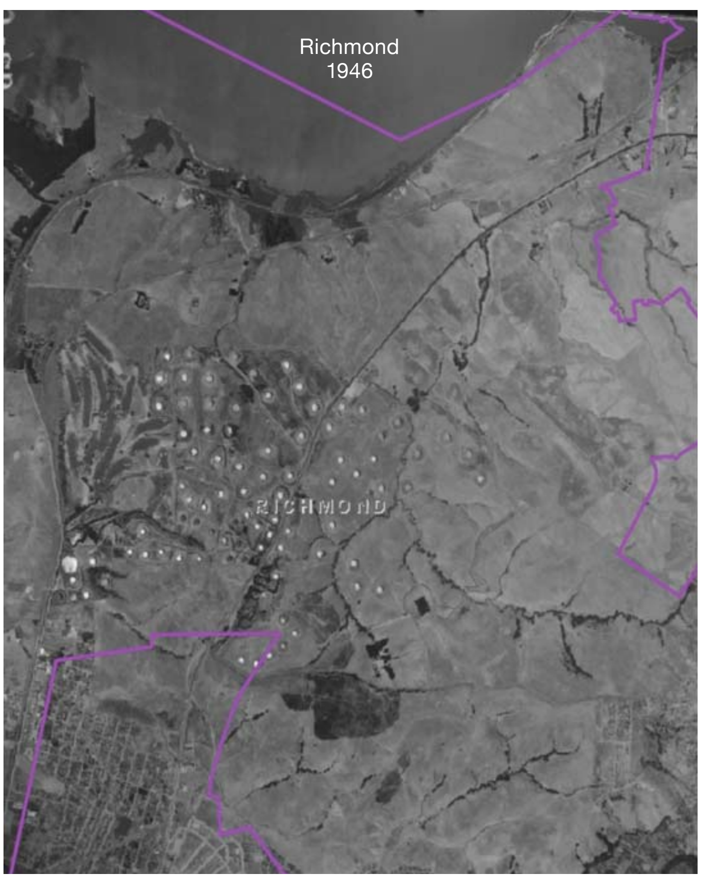
# EAST BAY MUNICIPAL UTILITY DISTRICT
# WEST OF HILLS NORTHERN PIPELINES PROJECT

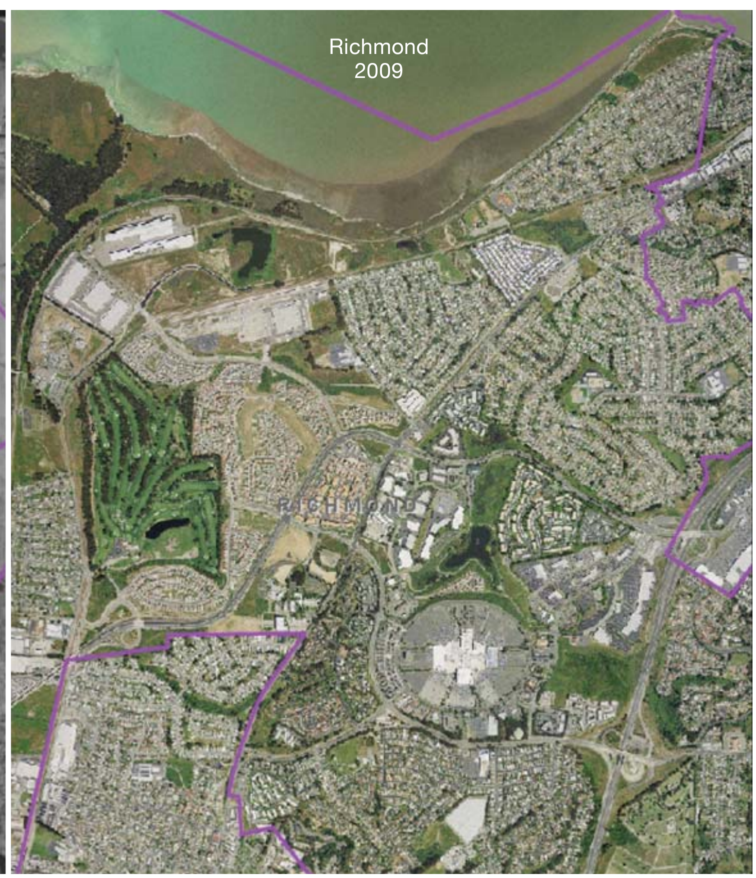
## Draft Environmental Impact Report

Prepared for
East Bay Municipal Utility District

May 2013

ESA



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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| μg/m$^3$ | micrograms per cubic meter |
| AB | Assembly Bill |
| ABAG | Association of Bay Area Governments |
| AC Transit | Alameda-Contra Costa Transit District |
| AADT | annual average daily traffic |
| ADT | average daily traffic |
| ARDTP | Archaeological Research Design and Treatment Plan |
| AASHTO | American Association of State Highway and Transportation Officials |
| APE | area of potential effects |
| ASCE | American Society of Civil Engineers |
| ASF | age sensitivity factor |
| ATCM | Air Toxics Control Measures |
| AWWA | American Water Works Association |
| BAAQMD | Bay Area Air Quality Management District |
| Basin Plan | Water Quality Control Plan for the San Francisco Bay Basin |
| BMPs | best management practices |
| BP | before present |
| °C | degrees Celsius |
| CAA | Clean Air Act |
| CAAQS | California Ambient Air Quality Standards |
| CalEMA | California Emergency Management Agency |
| Cal-EPA | California Environmental Protection Agency |
| CAL FIRE | California Department of Forestry and Fire Protection |
| Cal/OSHA | California Division of Occupational Safety and Health |
| Caltrans | California Department of Transportation |

| | |
|---|---|
| CAP | clean air plan |
| CARB | California Air Resources Board |
| CASQA | California Stormwater Quality Association |
| CBC | California Building Code |
| CCCCDD | Contra Costa County Community Development Department |
| CCCFCWCD | Contra Costa County Flood Control and Water Conservation District |
| CCH | California Consortium of Herbaria |
| CCR | California Code of Regulations |
| CCTA | Contra Costa Transportation Authority |
| CCTAWCAP | Contra Costa Transportation Authority West County Action Plan |
| CDFG | California Department of Fish and Game |
| CDFW | California Department of Fish and Wildlife |
| CDMG | California Division of Mines and Geology |
| CEC | California Energy Commission |
| CEQA | California Environmental Quality Act |
| CESA | California Endangered Species Act |
| CFC | chloroflourocarbons |
| CFR | Code of Federal Regulations |
| cfs | cubic feet per second |
| CGS | California Geological Survey |
| $CH_4$ | methane |
| CHHSL | California Human Health Screening Levels |
| CNDDB | California Natural Diversity Database |
| CNEL | community noise equivalent level |
| CNPS | California Native Plant Society |
| CO | carbon monoxide |
| $CO_2$ | carbon dioxide |
| $CO_2e$ | carbon-dixoide equivalent |
| COG | Councils of Government |
| CRLF | California red-legged frog |
| CUPA | Certified Unified Program Agency |
| CPUC | California Public Utilities Commission |

| | |
|---|---|
| CWA | Clean Water Act |
| CY | cubic yards |
| DA | Alameda County District Attorney |
| dB | decibel |
| dBA | A-weighted decibels (or decibels as measured on the A-weighting network) |
| DDT | dichlorodiphenyltrichloroethane |
| DPM | diesel particulate matter |
| DPR | California Department of Parks and Recreation |
| DPS | distinct population segments |
| DTSC | Department of Toxic Substances Control |
| EBMUD | East Bay Municipal Utility District |
| EAS | Extended Archaeological Survey |
| EIR | environmental impact report |
| ESA | environmental site assessment |
| ESL | environmental screening level |
| ESP | engineering standard practice |
| °F | degrees Fahrenheit |
| FEMA | Federal Emergency Management Agency |
| FESA | federal Endangered Species Act |
| FHSZ | fire hazards severity zones |
| g | gravity |
| FTA | Federal Transit Administration |
| GHG | greenhouse gases |
| GIS | geographic information system |
| GPS | global positioning system |
| $H_2S$ | hydrogen sulfide |
| HCM | highway capacity manual |
| HFC | hydroflourocarbons |
| HI | hazard index |
| HMBP | hazardous materials business plan |
| HNLs | hourly noise levels |

| | |
|---|---|
| hp | horsepower |
| HPD | historic properties directory |
| Hz | Hertz |
| I-80 | Interstate 80 |
| I-580 | Interstate 580 |
| I/O | inlet/outlet |
| in/sec | inches per second |
| IPCC | Intergovernmental Panel on Climate Change |
| LCFS | low carbon fuel standard |
| $L_{dn}$ | day-night average noise level |
| $L_{eq}$ | equivalent (steady-state) noise level |
| LID | low impact development |
| $L_{max}$ | maximum noise level |
| LOS | level of service |
| LSM | less than significant with mitigation |
| LUD | land use unit demand |
| LUP | Linear Underground/Overhead Project |
| LUST | leaking underground storage tank |
| MCE | maximum credible earthquake |
| MCLs | maximum contaminant levels |
| MEI | maximally exposed individual |
| mg | milligrams |
| MG | million gallons |
| MT | metric tons |
| mgd | million gallons per day |
| mg/Kg | milligrams per kilogram |
| mg/L | milligrams per liter |
| MM | Modified Mercalli |
| Mmax | maximum moment magnitude |
| MMRP | Mitigation Monitoring and Reporting Program |
| MMT | million metric tons |
| mph | miles per hour |

| | |
|---|---|
| MRZs | Mineral Resource Zones |
| MTBA | Migratory Bird Treaty Act |
| MTC | metropolitan transportation commission |
| MUTCD | Manual on Uniform Traffic Control Devices |
| Mw | moment magnitude |
| $N_2O$ | nitrous oxide |
| NAAQS | National Ambient Air Quality Standards |
| NAHC | Native American Heritage Commission |
| NAL | Numeric Action Level |
| NAVD | North American Vertical Datum of 1988 |
| NHPA | National Historic Preservation Act |
| $N/m^2$ | Newton per square meter |
| NMFS | National Marine Fisheries Service |
| NO | nitric oxide |
| $NO_2$ | nitrogen dioxide |
| NOI | notice of intent |
| NOP | notice of preparation |
| NOx | nitrogen oxides |
| NPDES | National Pollutant Discharge Elimination System |
| NPPA | Native Plant Protection Act |
| NRCS | National Resources Conservation Service |
| NTU | nephelometric turbidity unit |
| NWIC | California Historic Resources Information System – Northwest Information Center |
| $O_3$ | ozone |
| OHP | Office of Historic Preservation |
| OPR | California Office of Planning and Research |
| OSHA | Occupational Safety and Health Administration |
| PCB | polychlorinated biphenyl |
| PERP | Portable Equipment Registration Program |
| PFC | perflourocarbons |
| PGA | peak ground acceleration |

| | |
|---|---|
| PG&E | Pacific Gas and Electric Company |
| PM | particulate matter |
| $PM_{10}$ | particulate matter 10 microns in diameter or less |
| $PM_{2.5}$ | particulate matter 2.5 microns in diameter or less |
| ppm | parts per million |
| ppmv | parts per million by volume |
| ppmw | parts per million by weight |
| PPV | peak particle velocity |
| PRC | Public Resources Code |
| PRD | permit registration document |
| RCRA | Resource Conservation and Recovery Act |
| RMP | risk management plan |
| ROG | reactive organic gases |
| ROW | right-of-way |
| RPG | registered professional geologist |
| RPS | renewable portfolio standard |
| RWQCB | Regional Water Quality Control Board |
| SARA | Superfund Amendments and Reauthorization Act |
| SB | Senate Bill |
| $SF_6$ | sulfur hexafluoride |
| SFBAAB | San Francisco Bay Area Air Basin |
| SHPO | State Historic Preservation Office |
| $SO_2$ | sulfur dioxide |
| SLIC | spills, leaks, investigation, clean up |
| STLC | soluble threshold limit concentration |
| SU | significant and unavoidable |
| SVP | Society of Vertebrate Paleontology |
| SWPPP | Storm Water Pollution Prevention Plan |
| SWRCB | State Water Resources Control Board |
| TAC | toxic air contaminant |
| TCLP | toxicity characteristic leaching procedure |
| TMDL | total maximum daily load |

| | |
|---|---|
| TTLC | total threshold limit concentration |
| UC | University of California |
| UCMP | University of California Museum of Paleontology |
| UBC | Uniform Building Code |
| USC | University of Southern California |
| U.S.C. | United States Code |
| USA North | Underground Services Alert of Northern California |
| USACE | United States Army Corps of Engineers |
| USEIA | United States Energy Information Administration |
| USEPA | United States Environmental Protection Agency |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |
| UST | underground storage tank |
| UWMP | urban water management plan |
| V/C | volume to capacity |
| VOC | volatile organic compound |
| WOH | West of Hills |
| WOHNP | West of Hills Northern Pipeline |
| WRAP | Wildcat Creek Restoration Action Plan |
| WTP | water treatment plant |

# SUMMARY

## S.1 Introduction

This Draft Environmental Impact Report (EIR) assesses the potential impacts of the West of Hills Northern Pipelines Project (Project) proposed by the East Bay Municipal Utility District (EBMUD). **Figure S-1** identifies the Project location, as well as nearby cities and major roadways in the Project vicinity.

This document has been prepared in accordance with the California Environmental Quality Act (CEQA) Statue, Pub. Res. Code Sections 21000-21178, Statutes and Guidelines, 14 Cal. Regs. Section 15000-15387. EBMUD is the lead agency for this CEQA process. Written comments about the proposed Project or EIR should be directed to:

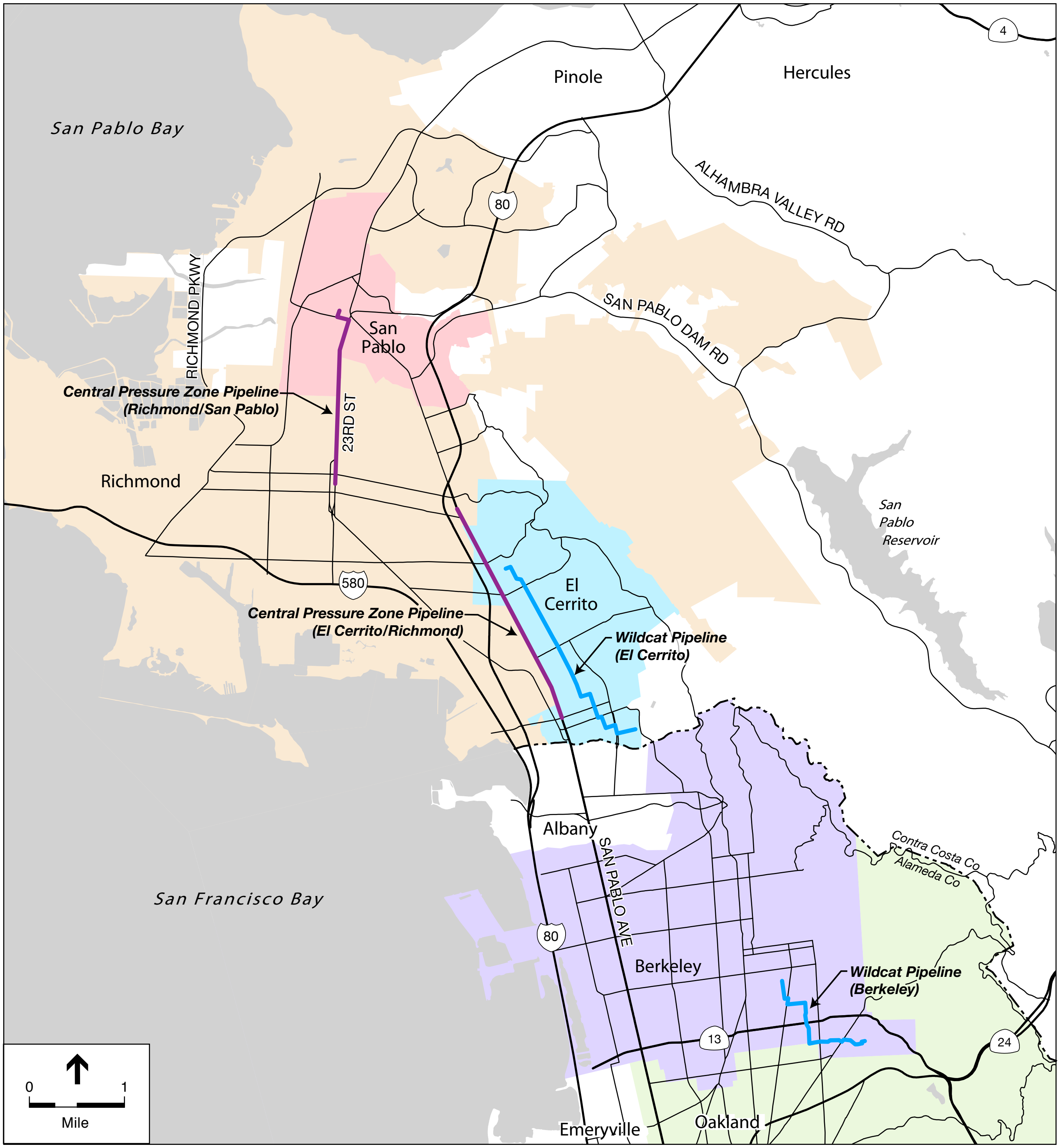
Timothy McGowan, Associate Civil Engineer, Project Manager
East Bay Municipal Utility District
375 Eleventh Street (Mail Slot 701)
Oakland, CA 94607
WOHNP@ebmud.com

## S.2 Background

The proposed Project includes the construction of four water transmission pipelines as part of the planned system of improvements under the *West of Hills Master Plan* at EBMUD. The proposed Project would correct existing transmission and storage operations deficiencies, meet future water demands, improve system reliability and water quality, and improve winter time redundancy to facilitate facility outages necessary to replace or upgrade aging infrastructure. The proposed pipelines are located in the city of Berkeley in Alameda County and the cities of El Cerrito, Richmond, and San Pablo in Contra Costa County, as shown in Figure S-1.

## S.3 Project Description

The proposed Project involves the construction and operation of four water transmission pipeline segments (see Figure S-1). The proposed pipeline routes are primarily located within existing city streets. The exact placement of the pipelines within selected roadways is not presently known for all segments.




SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure S-1**
Project Location

- ***Wildcat Pipeline (Berkeley).*** This proposed pipeline, 48-inches in diameter and approximately 1.5 miles long, would be located in the city of Berkeley, Alameda County. An alternative alignment for a portion of this pipeline, located in Benvenue Avenue, is under consideration and is evaluated in the EIR. Based on the analysis in this EIR, EBMUD has determined that the Benvenue Avenue alignment is the environmentally superior alignment and is the preferred alternative.
- ***Wildcat Pipeline (El Cerrito).*** This proposed pipeline, 36-inches in diameter and approximately 2.5 miles long, would be located in the city of El Cerrito, Contra Costa County.
- ***Central Pressure Zone Pipeline (El Cerrito/Richmond).*** This proposed pipeline, 36-inches in diameter and approximately 2.5 miles long, would be located in San Pablo Avenue in the cities of El Cerrito and Richmond, Contra Costa County.
- ***Central Pressure Zone Pipeline (Richmond/San Pablo).*** This proposed pipeline, 36-inches in diameter and approximately 1.9 miles long, would be located primarily in 23rd Street in the cities of Richmond and San Pablo, Contra Costa County. At San Pablo Creek, the pipeline would be constructed within an existing EBMUD utility corridor consisting of two EBMUD-owned properties (assessor parcels 411-282-002 and 412-300-001, totaling 0.28 acres) located between Brookside Drive and Road 20 in San Pablo. An alternative alignment at San Pablo Creek (near San Pablo Avenue) is under consideration and is evaluated in the EIR. This alternative alignment would be developed partly within a parcel owned by the City of San Pablo (assessor parcel 411-282-001).

For the most part, construction of the pipelines would be by conventional open trench construction methods. Where the Central Pressure Zone Pipeline (Richmond/San Pablo) crosses San Pablo Creek, EBMUD proposes to construct a pipe bridge, and tunneling (“jack and bore”) is proposed where the Central Pressure Zone Pipeline (Richmond/San Pablo) crosses Wildcat Creek. At Wildcat Creek, a portion of a park (assessor parcel 411-281-015) owned by the City of San Pablo may be used to locate the jacking pit for the jack and bore crossing of the creek.

Construction would typically occur between 8 a.m. and 7 p.m. Construction of both Wildcat Pipeline segments would occur over a 9 to 14 month period from approximately mid-2015 to mid-2017. Construction of both Central Pressure Zone Pipeline segments would occur over a 10 to 16 month period beginning in 2021.

# S.4 Summary of Impacts

**Table S-1** below is a summary of all significant impacts and required mitigations identified for the proposed Project, as well as impacts identified as less-than-significant impacts (including impacts identified as “not significant” or “no impact” in the analysis in Chapter 3 where mitigation is not required). For all significant impacts, the significance after mitigation is determined. The applicability of mitigation measures to the related impacts for each pipeline segments is noted as follows:

W.B = Wildcat Pipeline (Berkeley),
W.E = Wildcat Pipeline (El Cerrito),
C.E/R = Central Pressure Zone Pipeline (El Cerrito/Richmond), and
C.R/S = Central Pressure Zone Pipeline (Richmond/San Pablo).

**TABLE S-1**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] | | | | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| | | W.B | W.E | C.E/R | C.R/S | |
| **AESTHETICS** | | | | | | |
| **Impact 3.2-1:** Short-term visual effects experienced from nearby areas during project construction**.** | None Required. | | | | | |
| **Impact 3.2-2:** Short-term visual effects experienced from nearby areas due to nighttime construction lighting. | **Mitigation Measure AES-1: Reduce Nighttime Lighting.** To the extent practical, ensure that stationary lighting used during nighttime construction (if required) is of limited duration, shielded and directed downward or oriented such that the light source is not directed toward residential areas. | X | X | X | X | Less than Significant. |
| **Impact 3.2-3:** Tree removal may affect visual character. | **Mitigation Measure AES-2**: **Tree Replacement and Landscaping Restoration.** If construction of the Wildcat Pipeline (Berkeley) requires the removal of trees or landscaping within a public right-of-way, EBMUD will replant trees and restore landscaping consistent with the following guidelines:<br>• If any mature native tree (i.e., trees that are 6 inches in diameter at breast height [dbh] or ten inches aggregate dbh for multi-trunk trees) is removed, replanting will be with the same species at a 1:1 ratio. To allow for access to the pipeline, replanted trees will not be located within 20 feet of the pipeline.<br>• All non-native protected trees which are removed will be replaced at a 1:1 ratio with a non-invasive or native tree species.<br>• All disturbed plant, bush, and groundcover landscaping will be restored to pre-project conditions, using similar plants and materials.<br>Mitigation Measure BIO-1d. | X | | | X | Less than Significant. |
| **Impact 3.2-4:** Construction of a pipe bridge may affect the visual character at San Pablo Creek. | None. | | | | | Significant and Unavoidable. |
| **Impact 3.2-5:** Aboveground appurtenances may affect visual character along the pipeline routes. | None Required. | | | | | |
| **AIR QUALITY** | | | | | | |
| **Impact 3.3-1:** Activities associated with proposed construction would generate significant, short-term increases in criteria pollutant emissions, including suspended and inhalable particulate matter and equipment exhaust emissions. | **Mitigation Measure AIR-1a: Construction Mitigation Measures.** To limit the Project's construction-related dust and criteria pollutant emissions, the following BAAQMD-recommended *Basic Construction Mitigation Measures* will be included in the contractor specifications for the proposed Project:<br>• When moisture content is low enough to create dust, all exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) | X | X | X | X | Less than Significant. |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] | | | | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| | | W.B | W.E | C.E/R | C.R/S | |
| **AIR QUALITY (cont.)** | | | | | | |
| **Impact 3.3-1** (cont.) | will be watered two times per day or as needed to control dust. Areas may be rocked to minimize dust and water, covered, or sprayed with soil binder.<br>• All haul trucks transporting soil, sand, or other loose material off-site will be covered.<br>• All visible mud or dirt track-out onto adjacent public roads will be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.<br>• All vehicle speeds on unpaved roads will be limited to 15 miles per hour.<br>• All roadways, driveways, and sidewalks to be paved will be completed as soon as possible.<br>• Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage will be provided for construction workers at all access points.<br>• All construction equipment will be maintained and properly tuned in accordance with manufacturer's specifications. All equipment will be checked by a certified mechanic and determined to be running in proper condition prior to using the equipment at the construction site.<br>• A publicly visible sign with the telephone number and email address to contact EBMUD regarding dust complaints will be posted at the site. If dust exceeds specified limits, EBMUD would respond and take corrective action within 48 hours. | | | | | |
| | **Mitigation Measure AIR-1b: $NO_x$ Control** To reduce the Project's construction-related $NO_X$ emissions, if construction of the Wildcat (Berkeley) and Wildcat (El Cerrito) pipelines occurs at the same time, or if two pipeline construction headings are undertaken on either the Wildcat (Berkeley) or Wildcat (El Cerrito) pipelines, the Project's on-road haul truck fleet will be, on average, model year of 2010 or newer. | X | X | | | |
| **Impact 3.3-2:** Project construction could expose sensitive receptors to substantial pollutant concentrations. | None Required. | | | | | |
| **Impact 3.3-3:** Project construction activities would not create objectionable odors affecting a substantial number of people. | None Required. | | | | | |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] | | | | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| | | W.B | W.E | C.E/R | C.R/S | |
| **AIR QUALITY (cont.)** | | | | | | |
| **Impact 3.3-4:** Project operations would not violate air quality standards or contribute substantially to an existing air quality violation, expose sensitive receptors to substantial pollutant concentrations, or create objectionable odors. | None Required. | | | | | |
| **BIOLOGICAL RESOURCES** | | | | | | |
| **Impact 3.4-1:** The proposed Project could have a substantial adverse effect on special-status species during open-trench construction in Urban habitat. | None Required. | | | | | |
| **Impact 3.4-2:** The proposed Project could have a substantial adverse effect on special-status species in Riparian habitats during construction at creek crossings using jack and bore and pipe bridge methods. | **Mitigation Measure BIO-1a: General Protection Measures.**<br>EBMUD will ensure that the following general measures are implemented by the contractor(s) during construction to minimize or avoid impacts on biological resources:<br>• Removal of native and ornamental trees and shrubs will be minimized by locating staging areas away from vegetated areas and restricting construction areas in vegetated areas to the extent practical. No trees will be removed from private property.<br>• At the San Pablo Creek crossing, temporary fencing will be installed at the perimeter of the pipe bridge work area to protect trees on private property (see also description of exclusion fence, in Measure BIO-1b). The contractor will maintain the temporary fencing until all construction activities are completed. No construction activities, parking, or staging will occur beyond the fenced areas.<br>• The contractor will provide closed garbage containers for the disposal of all food-related trash items (e.g., wrappers, cans, bottles, food scraps). All garbage will be collected daily from the project site and placed in a closed container, from which garbage will be removed weekly.<br>• Construction personnel will not feed or otherwise attract fish or wildlife in the project area.<br>• If vehicle or equipment fueling or maintenance is necessary, it will be performed in the designated staging areas located at least 50 feet from the top of bank of watercourses. | | | | X | Less than Significant. |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] W.B | W.E | C.E/R | C.R/S | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| **BIOLOGICAL RESOURCES (cont.)** | | | | | | |
| **Impact 3.4-2** (cont.) | **Mitigation Measure BIO-1b: Riparian Protection Measures.**<br>• Prior to the start of pipe bridge construction at San Pablo Creek, silt fencing or other appropriate erosion control measures will be installed at the limit of the construction areas near the top of bank and extending to the limit of EBMUD property at Brookside Drive and private property on the north side of San Pablo Creek and along the limits of construction facing Wildcat Creek. Silt fencing will be at least three feet high, and with a bottom edge buried at least three inches, to contain sediment and potential spills within the work area.<br>• Construction contractor(s) will minimize the extent of the construction disturbance as much as feasible, especially within the drip lines of riparian trees and the bed and bank of San Pablo Creek by locating staging areas outside of riparian areas and restricting construction areas in riparian areas to the extent practical.<br>• A construction employee education program will be conducted prior to the initiation of ground disturbing activities at the San Pablo Creek pipe bridge construction area. The program will consist of a brief presentation by persons knowledgeable about California red legged frog, steelhead, western pond turtle, raptor and nesting bird biology and legislative protection to explain endangered species concerns to contractors and their employees. The program will include a description of the measures being taken to reduce impacts to these species during project construction and implementation. A fact sheet conveying this information will be prepared for distribution to the above-mentioned people and other Project-related personnel entering the San Pablo Creek riparian corridor. At a minimum, the program would include:<br>- Description and natural history of the species;<br>- Representative photographs;<br>- Species' legal status;<br>- Measures to prevent the spread of invasive, non-native species;<br>- Terms and conditions of any biological permits; and<br>- Penalties for not complying with terms and conditions.<br>**Mitigation Measure BIO-1c: Implement preconstruction surveys near Riparian habitat.**<br>During the breeding bird season (February 1 through August 31) and not more than two weeks before onset of construction (including equipment mobilization) of the tunnel beneath Wildcat Creek and the pipe bridge over San Pablo Creek a qualified biologist will conduct preconstruction surveys for nesting raptors and songbirds within 500 feet of the construction area. | | | | | |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

<table>
<tr><th rowspan="2">ENVIRONMENTAL IMPACT</th><th rowspan="2">MITIGATION MEASURES</th><th colspan="4">MITIGATION MEASURES APPLICABLE[a]</th><th rowspan="2">SIGNIFICANCE AFTER MITIGATION</th></tr>
<tr><th>W.B</th><th>W.E</th><th>C.E/R</th><th>C.R/S</th></tr>
<tr><td colspan="7">BIOLOGICAL RESOURCES (cont.)</td></tr>
<tr><td>Impact 3.4-2 (cont.)</td><td>• Surveys will include all potential habitats within 500 feet (for raptors) of activities and all on-site vegetation including bare ground within 250 feet of activities (for all other species).<br>• If construction activities occur only during the non-breeding season, between September 1 and January 31, no surveys will be required.<br>• Results of the surveys will be forwarded to CDFW (if results are positive for nesting birds) and avoidance procedures will be adopted, if necessary, on a case-by-case basis. These may include construction buffer areas or seasonal avoidance. Typical buffer distances are 250 feet for non-raptor species, and 500 feet for raptors but these may be adjusted through consultation with CDFW on a case by case basis.<br>Prior to removal of mature trees at San Pablo Creek, a pre-construction survey will be carried out by a qualified wildlife biologist using an acoustic detector. If signs of bat activity are detected, the biologist will make recommendations about how to minimize adverse effects to the bats, such as adjusting timing of tree removal, or the creation of a “no disturbance” buffer, if feasible.<br>Mitigation Measure BIO-1d: Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation for Riparian Habitats.<br>This measure would apply only to San Pablo Creek crossing, which is the only location where natural habitat would be directly impacted.<br>At least one month prior to construction and during the plant growing season (March-July), a qualified botanist performs preconstruction surveys of the construction area to collect vegetation composition data, vegetation structure (tree diameter size, etc.), and percent cover of plant species. Photo documentation will be used to show pre-project conditions.<br>Prepare and implement a vegetation restoration plan with detailed specifications for minimizing the introduction of invasive weeds and restoring all temporarily disturbed areas.<br>For the purpose of existing pipeline maintenance as well as proposed pipe bridge construction, trees removed at the alternative San Pablo Creek crossing on EBMUD land would not be replaced on-site. Shrubs and other plants will be re-planted on EBMUD land within the pipeline alignment. Replacement tree planting could occur on-site if the selected San Pablo Creek crossing is the eastern alternative adjacent to 23rd Street and Kennedy Plaza. However, to allow for access to the pipeline, replanted trees will not be located within 20 feet of the pipeline. Tree replacement will adhere to the following guidelines:</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] W.B | W.E | C.E/R | C.R/S | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| **BIOLOGICAL RESOURCES (cont.)** | | | | | | |
| **Impact 3.4-2** (cont.) | • If any mature native tree (i.e., trees that are 6 inches in diameter at breast height [dbh] or ten inches aggregate dbh for multi-trunk trees) is removed, replanting will be with the same species at a 1:1 ratio.<br>• All non-native protected trees which are removed will be replaced at a 1:1 ratio with a non-invasive tree species.<br>Non-native trees removed from a natural environment will be replaced with a native species that occurs in the area.<br>• Efforts will be made to plant replacement trees within the San Pablo Creek watershed. However if no ecologically appropriate sites are available within the watershed, EBMUD will work with local organizations to plant trees in adjacent watersheds on public lands.<br>• In lieu of tree replacement (if the western alternative crossing of San Pablo Creek is selected), EBMUD will fund riparian or upland restoration work by a local creek group (such as San Pablo Watershed Neighbors Education and Restoration Society (SPAWNERS) or Friends of Five Creeks) for the purposes of compensating for tree loss associated with the Project. In-lieu restoration work would be appropriate where restoration activities would provide greater benefit to protected trees than tree replacement. Examples of appropriate restoration work include invasive plant removal or actions to reduce exposure or risk of sudden oak death. The funded restoration work must provide habitat benefits commensurate with that lost through the removal of trees.<br>• Implementation of in-lieu restoration, especially tree planting, is recommended well in advance of construction of the Central Pressure Zone Pipeline (Richmond/San Pablo) because it would ensure that replacement trees are established and beginning to provide habitat values for wildlife by the time project construction is expected to commence. Planting would be carried out at streambank restoration sites elsewhere within the watershed.<br>If required, EBMUD will provide the vegetation restoration and replacement plan to the Corps, CDFW, RWQCB, and USFWS during the permitting process, as any vegetation to be removed may provide habitat for special-status species and may also be within areas under the jurisdiction of the Corps and RWQCB. The determination of mitigation requirement (i.e., extent of habitat loss) and accumulated habitat values for advance in-lieu restoration would be determined during the permitting process. The minimum avoidance, minimization, and restoration measures as well as success criteria to be included in the vegetation restoration plan are described below. | | | | | |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] W.B | W.E | C.E/R | C.R/S | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| **BIOLOGICAL RESOURCES (cont.)** | | | | | | |
| **Impact 3.4-2** (cont.) | *Invasive Weed Control Measures*<br>Invasive weeds such as Canary ivy, Himalayan blackberry, and Cape ivy readily colonize riparian soils that have been disturbed by grading or other mechanical disturbance. Although the project area has an extensive weed infestation and relatively few native species, EBMUD will incorporate the following measures into the construction plans and specifications for construction within riparian zones of San Pablo Creek and Wildcat Creek to permit restored riparian vegetation to become established and to prevent the spread of additional invasive species:<br>• Construction equipment will arrive at the project area washed and free of soil, seed, and plant parts to reduce the likelihood of introducing new weed species.<br>• Any imported fill material, soil amendments, gravel etc., required for construction and/or restoration activities that would be placed within the upper 12 inches of the ground surface will be free of vegetation and plant material.<br>• California Department of Food and Agriculture certified, weed-free, imported erosion-control materials (or rice straw in upland areas) will be used exclusively, as applicable (this measure concerns biological material and does not preclude the use of silt fences, etc.).<br>• The environmental awareness training program for construction personnel will include an orientation regarding the importance of preventing the spread of invasive weeds.<br>• The restoration plan will specify measures to remove and/or control weeds in the project area.<br>• No invasive species will be used in any restoration plantings.<br>*Minimum Restoration Measures*<br>Restoration areas are riparian areas within the project area that would be disturbed during Project-related construction activities but would subsequently be restored to their preconstruction conditions as defined by the success criteria described below. In order to restore these areas, EBMUD will ensure the following:<br>*Minimum Success Criteria*<br>Unless otherwise determined by the applicable resource agencies, the success criteria for restoring temporarily disturbed areas will be as follows:<br>• Tree replacement and re-vegetation will occur within the first year after the completion of construction. | | | | | |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] | | | | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| | | W.B | W.E | C.E/R | C.R/S | |
| **BIOLOGICAL RESOURCES (cont.)** | | | | | | |
| **Impact 3.4-2** (cont.) | • A qualified arborist or biologist will monitor newly planted trees at least twice a year for 5 years.<br>• Any trees planted as remediation for failed plantings will be planted as stipulated here for original plantings, and will be monitored for a period of 5 years following installation, or as otherwise determined by the applicable resource agencies.<br>• Where native vegetation is present and/or for erosion control purposes, all temporarily disturbed areas will be restored to approximate their baseline condition. Pre-construction baseline monitoring will be conducted to determine vegetative cover at the site. Revegetation success criteria will be based on the baseline monitoring and will stipulate that site cover of target weed species is equal to or less than the baseline condition.<br>• At the end of the 5 year monitoring period, vegetation within restoration areas will be functional, fully established, and self-sustaining as evidenced by healthy vegetative growth; observed increase in vegetative cover, canopy cover, and/or plant height; successful flowering, seed set, and/or vegetative reproduction over the 5-year monitoring period.<br>• Revegetation work will start within one year of construction completion.<br>• Restoration areas will be monitored for target invasive plants during the 5-year monitoring period, and they will be removed as necessary to support meeting the cover and vegetation composition success criteria.<br>• Monitoring and maintenance will continue until the minimum success criteria are met, or as otherwise determined by the applicable resource agencies. | | | | | |
| **Impact 3.4-3:** The proposed Project could have a substantial adverse effect on jurisdictional waters during construction. | Mitigation Measures BIO-1b, BIO-1d and HYD-1. | X | | | X | Less than Significant. |
| **Impact 3.4-4:** The proposed Project could have a substantial adverse effect on resident trout and other native fishes during construction, either by impeding movement or adversely affecting aquatic habitat. | Mitigation Measure HYD-1. | | | | X | Less than Significant. |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] | | | | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| | | W.B | W.E | C.E/R | C.R/S | |
| **BIOLOGICAL RESOURCES (cont.)** | | | | | | |
| **Impact 3.4-5:** The proposed Project could have a substantial adverse effect on wildlife corridors or wildlife nursery sites during construction. | None Required. | | | | | |
| **Impact 3.4-6:** Construction activities associated with the proposed Project could conflict with local policies or ordinances protecting biological resources. | Mitigation Measure AES-2, BIO-1a. | X | | | X | Less than Significant. |
| **Impact 3.4-7:** The proposed Project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. | None Required. | | | | | |
| **CULTURAL RESOURCES** | | | | | | |
| **Impact 3.5-1:** Construction of the proposed Project could cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines, Section 15064.5. | Mitigation Measure NOI-4. | X | X | X | X | Less than Significant. |
| **Impact 3.5-2:** Construction of the proposed Project could cause a substantial adverse change in the significance of an archaeological resource, including those determined to be a historical resource defined in Section 15064.5 or a unique archaeological resource defined in PRC 21083.2. | **Mitigation Measure CUL-1a: Retain a Qualified Archaeologist.**<br>A qualified archaeologist meeting the Secretary of the Interior's Qualification Standard will be retained by EBMUD prior to approximately 50% design phase (when the specific location of the alignments within the roadways have been established) to carry out the cultural resources mitigation measures contained herein.<br>**Mitigation Measure CUL-1b: Develop an Archaeological Research Design and Treatment Plan.**<br>A qualified archaeologist will prepare an Archaeological Research Design and Treatment Plan (ARDTP) that addresses, at a minimum, the following: the establishment of Environmentally Sensitive Areas; treatment and recovery of important scientific data contained within the portions of the historical resources located within the project Area of | X | X | X | X | Less than Significant. |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] W.B | W.E | C.E/R | C.R/S | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| **CULTURAL RESOURCES (cont.)** | | | | | | |
| **Impact 3.5-2** (cont.) | Potential Effects (APE); construction worker cultural resources sensitivity training; archaeological and Native American monitoring; inadvertent discovery protocols; and provisions for curation of recovered materials. The ARDTP will address the methods for subsurface investigation at each of the four historical resources (CA-CCO-432; CA-CCO-758; WOH-01; WOH-02) to determine whether the portions of the sites located within the project APE contribute to each of the sites' overall eligibility. The subsurface investigation will seek to identify whether the portions of the sites within the APE contain important scientific data (Criterion D/4) or other archaeological materials of traditional/cultural value to Native American tribes (Criteria A/1, B/2, and C/3). The ARDTP will include the specific methods that will be employed at each site location (i.e. the length and depth of excavation, the type of equipment utilized, the percent of area investigated at each site location). The investigation may include trenching in the APE adjacent to the visible site components and may be coordinated with potholing to confirm the location of existing utilities. The ARDTP will identify how the proposed program would preserve any significant historical information obtained and will identify the scientific/historic research questions applicable to the resources, the data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. The results of the investigation will be documented in a technical report that provides a full artifact catalog, analysis of items collected, results of any special studies conducted, and interpretations of the resource within a regional and local context. All technical documents are to be placed on file at the Northwest Information Center of the California Historical Resources Information System. The results report will also provide recommendations for archaeological and Native American monitoring in Environmentally Sensitive Areas of the proposed Project to the extent deemed appropriate by the qualified archaeologist who carried out the work described here.<br><br>**Mitigation Measure CUL-1c: Inadvertent Discovery of Cultural Resources.**<br><br>Following implementation of CUL-1b, if prehistoric or historic-period cultural materials that were not identified and studied in the ARDTP are unearthed during ground-disturbing activities, all work will halt within 100 feet of the find until a qualified archaeologist, defined as one meeting the Secretary of the Interior's Professional Qualification Standards for archaeology, can assess the significance of the find. Prehistoric materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks and artifacts; stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered-stone tools, such as hammerstones and pitted stones. Historic-period materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic | | | | | |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] | | | | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| | | W.B | W.E | C.E/R | C.R/S | |
| **CULTURAL RESOURCES (cont.)** | | | | | | |
| **Impact 3.5-2** (cont.) | refuse. If the find is determined to be potentially significant, the archaeologist, in consultation with the lead agency and appropriate Native American representative, will implement actions outlined in the ARDTP. | | | | | |
| **Impact 3.5-3:** Construction of the proposed Project could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. | **Mitigation Measure CUL-2a: Paleontological Resources Mitigation Program.**<br><br>Prior to ground disturbance, EBMUD will retain a qualified paleontologist or a California Registered Professional Geologist (California RPG) with appropriate paleontological expertise to carry out all mitigation measures related to paleontological resources. The qualified paleontologist or geologist will be available "on-call" to EBMUD throughout the duration of ground-disturbing activities.<br><br>**Mitigation Measure CUL-2b: Paleontological resources training.**<br><br>All construction forepersons and field supervisors conducting or overseeing subsurface excavations will be trained in the recognition of potential fossil materials prior to ground disturbing activities. A one hour pre-construction training on paleontological resources will also be provided to all other construction workers, but may include videotape of the initial training and/or the use of written materials rather than in person training by the qualified paleontologist. In addition to fossil recognition, the training will convey procedures to follow in the event of a potential fossil discovery.<br><br>**Mitigation Measure CUL-2c: Assessment and salvage of potential fossil finds.**<br><br>If potential fossils are discovered during construction, all earthwork or other types of ground disturbance in the immediate vicinity of the find will stop until the qualified paleontologist can assess the nature and importance of the find. Based on the scientific value or uniqueness of the find, the paleontologist may record the find and allow work to continue, or recommend salvage and recovery of the fossil. If treatment and salvage is required, recommendations will be consistent with current professional standards. If required, treatment for fossil remains may include preparation and recovery of fossil materials so that they can be housed in an appropriate museum or university collection.<br><br>**Mitigation Measure CUL-2d: Monitoring by a qualified Paleontologist during ground disturbing activities.**<br><br>If found to be warranted based on experience during construction, a qualified paleontologist, or paleontological monitor working under the supervision of a qualified paleontologist, will monitor ground-disturbing activities. This monitoring would consist of periodically inspecting disturbed, graded, and excavated surfaces, as well as soil stockpiles and disposal sites. The frequency of monitoring would be determined by the qualified paleontologist. If the monitor encounters a paleontological resource, he or she will assess the fossil, and record or salvage it as described in CUL-2c. | X | X | X | X | Less than Significant. |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] | | | | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| | | W.B | W.E | C.E/R | C.R/S | |
| **CULTURAL RESOURCES (cont.)** | | | | | | |
| **Impact 3.5-4:** Construction of the proposed Project could disturb any human remains, including those interred outside of formal cemeteries. | **Mitigation Measure CUL-3: Inadvertent Discovery of Human Remains.**<br>If potential human remains are encountered, all work will halt within 100 feet of the find and EBMUD will be contacted. EBMUD will contact the county coroner in accordance with PRC Section 5097.98 and Health and Safety Code Section 7050.5. If the coroner determines the remains are Native American, the coroner will contact the NAHC. As provided in PRC Section 5097.98, the NAHC will identify the person or persons believed most likely to be descended from the deceased Native American. The most likely descendent will make recommendations for means of treating, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98. | X | X | X | X | Less than Significant. |
| **ENERGY CONSERVATION** | | | | | | |
| **Impact 3.6-1**: Construction and operation of the proposed Project would result in less-than-significant consumption of energy. | None Required. | | | | | |
| **Impact 3.6-2:** The proposed Project would not result in a significant impact on local and regional energy supplies or on requirements for additional capacity. | None Required. | | | | | |
| **Impact 3.6-3:** The proposed Project would not result in a significant impact on peak and base period demands for electricity and other forms of energy. | None Required. | | | | | |
| **Impact 3.6-4:** Construction and operation of the proposed Project would not conflict with existing energy standards. | None Required. | | | | | |
| **Impact 3.6-5:** The proposed Project would not result in a significant impact related to transportation energy use or use of efficient transportation alternatives. | None Required. | | | | | |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] | | | | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| | | W.B | W.E | C.E/R | C.R/S | |
| **GEOLOGY AND SOILS** | | | | | | |
| **Impact 3.7-1:** Surface Fault Rupture | None Required. | | | | | |
| **Impact 3.7-2:** Seismic-related ground failure including liquefaction. | **Mitigation Measure GEO-1: Site-Specific Geotechnical Investigation.**<br>For the Central Pressure Zone Pipeline (Richmond/San Pablo), EBMUD will conduct a site-specific geotechnical investigation at the Wildcat and San Pablo Creek crossings under the direction of a geotechnical engineer before final design of the proposed pipelines. The investigation will evaluate subsurface conditions related to the potential for geological and seismic hazards, including ground shaking as well as liquefaction and related phenomena such as lateral spreading and settlement. The geotechnical report will include recommendations regarding the seismic design of the pipeline at the Wildcat Creek crossing and the pipe bridge at San Pablo Creek to comply with current seismic standards and to withstand geologic and seismic hazards. These recommendations will be included in the project design and incorporated into project construction specifications, for implementation. | | | | X | Less than Significant. |
| **Impact 3.7-3:** Seismic ground shaking. | Mitigation Measure GEO-1. | | | | X | Less than Significant. |
| **Impact 3.7-4:** Seismically induced landslides. | None Required. | | | | | |
| **Impact 3.7-5:** Erosion and loss of topsoil. | None Required. | | | | | |
| **Impact 3.7-6:** Unstable geologic unit. | Mitigation Measure NOI-4. | | | | X | Less than Significant. |
| **Impact 3.7-7:** Expansive soil. | Mitigation Measure GEO-1. | | | | X | Less than Significant. |
| **GREENHOUSE GAS EMISSIONS** | | | | | | |
| **Impact 3.8-1:** Project construction-related GHG emissions would not result in a significant impact on climate change or conflict with applicable greenhouse gas reduction plans, policies, or regulations. | None Required. | | | | | |
| **Impact 3.8-2**: Project operational GHG emissions would not result in a significant impact on climate change or conflict with applicable greenhouse gas reduction plans, policies, or regulations. | None Required. | | | | | |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] | | | | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| | | W.B | W.E | C.E/R | C.R/S | |
| **HAZARDS AND HAZARDOUS MATERIALS** | | | | | | |
| **Impact 3.9-2:** The Project would not result in significant hazards to the public or the environment through the routine transport, use, or disposal of hazardous materials. | None Required. | | | | | |
| **Impact 3.9-3:** The proposed Project could result in potential adverse effects related to the rupture of subsurface utilities). | **Mitigation Measure HAZ-1a: Identifying Buried Utilities.**<br>EBMUD and/or its construction contractor(s) will adhere to EBMUD Engineering Standard Practice 514, Identifying Buried Conflicts (EBMUD, 2008) which sets forth the requirements and guidelines for planning, design and construction to identify existing buried utilities/conflicts.<br>**Mitigation Measure HAZ-1b: Subsurface Utility Protection.**<br>While any excavation is open, EBMUD or its contractors will protect, support, or remove underground utilities as necessary to safeguard employees.<br>**Mitigation Measure HAZ-1c: Notification of Utility Damage.**<br>EBMUD or its contractors will notify local fire departments whenever damage to a gas utility results in a leak or suspected leak, or whenever damage to any utility results in a threat to public safety. EBMUD or its contractors will also contact utility owners if any damage occurs as a result of the Project and coordinate repair with approval of the owner. | X | X | X | X | Less than Significant. |
| **Impact 3.9-4:** The Project could expose construction workers and the public to naturally occurring asbestos. | **Mitigation Measure HAZ-2: Asbestos Dust Mitigation Plan.**<br>For the Wildcat Pipeline (Berkeley) and Central Pressure Zone Pipeline (El Cerrito/ Richmond), EBMUD or its contractor will conduct soil testing within areas of the pipeline alignments that are located within 100 feet of mapped ultramafic rock. This may be completed in conjunction with potholing conducted during the design phase. If ultramafic rock is found within the pipeline alignment, EBMUD or its contractor will submit notification of proposed construction activities to the BAAQMD and prepare an Asbestos Dust Mitigation Plan to be implemented in areas containing ultramafic rock. Additional measures, including air quality monitoring for fugitive asbestos dust, may be required by the BAAQMD. The contractor will implement all specified dust control measures and keep records of daily inspections and activities that document implementation of the plan. The plan will comply with BAAQMD criteria and address the following as applicable:<br>• Prevent and control visible track-out from the project site.<br>• Ensure adequate wetting or covering of active storage piles and disturbed surface areas. | X | | X | | Less than Significant. |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] | | | | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| | | W.B | W.E | C.E/R | C.R/S | |
| **HAZARDS AND HAZARDOUS MATERIALS (cont.)** | | | | | | |
| **Impact 3.9-4** (cont.) | • Control earthmoving activities by pre-wetting ground or suspending activities during windy periods.<br>• Ensuring that trucks hauling excavated materials are adequately wet and covered.<br>• Stabilize disturbed areas following construction by paving or establishing vegetative cover. | | | | | |
| **Impact 3.9-5:** The Project would use of hazardous materials within ¼ mile of a school. | None Required. | | | | | Less than Significant. |
| **Impact 3.9-6:** Exposure of people or structures to a significant risk of property loss, injury, or death involving wildfires. | None Required. | | | | | Less than Significant. |
| **HYDROLOGY AND WATER QUALITY** | | | | | | |
| **Impact 3.10-1:** Degradation of water quality as a result of erosion and sedimentation or a hazardous materials release during construction. | **Mitigation Measure HYD-1: Schedule Construction Activities at Harwood Creek, Wildcat Creek, and San Pablo Creek During the Dry Season.**<br>The SWPPP, to be submitted in accordance with the Construction General Stormwater Permit, will include a schedule for construction activities that specifies a timeline for earthmoving activities, hydroseeding, and stabilization of soils and slopes. Incorporate into contract specifications that, in addition to the requirements of the Construction General Stormwater Permit, the contractor will limit construction activities within the 100-year flood zones of Harwood Creek, Wildcat Creek, and San Pablo Creek to the dry season. The schedule will indicate that all earthmoving activities at these creeks will occur during the dry season (i.e., between June 1 and October 15), unless otherwise negotiated with the appropriate regulatory agencies. The construction schedule will also specify that all materials for soil stabilization be on-site by September 15 and that site stabilization be completed by October 15. | X | | | X | Less than Significant. |
| **Impact 3.10-2**: Degradation of water quality resulting from discharges during dewatering of trenches and discharges of treated water. | None Required. | | | | | |
| **Impact 3.10-3:** Alteration of drainage patterns and impedance or redirection of flood flows. | None Required. | | | | | |
| **Impact 3.10-4:** Flooding resulting from a pipeline rupture. | None Required. | | | | | |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] W.B | W.E | C.E/R | C.R/S | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| **NOISE** | | | | | | |
| **Impact 3.11-1:** Construction activities could expose people to noise during time periods that fall outside of ordinance time limits or to noise levels that exceed ordinance limits. | **Mitigation Measure NOI-1: Time Limits, Administrative Controls, and Source Controls.**<br>a. An acoustical consultant qualified in construction noise control analysis and design will prepare a Noise Control Plan for each pipeline. This plan will include noise controls for all construction activities to reduce the noise to the 75-dBA (Leq) ordinance daytime noise limit and 54-dBA (Leq) ordinance nighttime noise limit to the extent feasible. These limits may be increased if ambient noise levels are higher, consistent with applicable ordinances. Measures to reduce noise levels and disturbance from construction noise to be incorporated into the Noise Control Plan will include, but are not be limited to, the following:<br>***Time Limits***<br>b. All construction activities, including truck operations (e.g., haul trucks and concrete delivery trucks), will be limited to the daytime weekday hours (8:00 a.m. to 7:00 p.m.) to the extent feasible.<br>***Noise Level Reduction Measures***<br>c. Best available noise-control techniques (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) will be used for all equipment and trucks, as necessary.<br>d. Stationary noise sources (e.g., pumps, compressors) will be located as far from sensitive receptors as possible and practicable and within the specified construction time limits. If they must be located near receptors, adequate muffling (with enclosures) will be used. Enclosure openings or venting will face away from sensitive receptors. A registered engineer qualified in noise control analysis and design will design the enclosures.<br>If impact equipment (e.g., jackhammers) is used during demolition or construction activities, the construction contractor(s) will use hydraulically or electrically powered equipment wherever practical to avoid the noise associated with compressed-air exhaust from pneumatically powered tools. However, where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed-air exhaust will be used (a muffler can lower noise levels from the exhaust by up to about 10 dB). External jackets on the tools themselves will be used, where feasible, which could achieve a reduction of 5 dB. Quieter procedures, such as drilling rather than impact equipment, will be used whenever practical. | X | X | X | X | Significant and Unavoidable (Berkeley and Richmond)<br>No Impact (El Cerrito and San Pablo) |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] W.B | W.E | C.E/R | C.R/S | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| **NOISE (cont.)** | | | | | | |
| **Impact 3.11-1** (cont.) | e. An EBMUD contact person will be designated to respond to construction-related issues, including noise. The phone number and e-mail address of the liaison will be conspicuously posted at construction areas, on all advanced notifications, and on the EBMUD project website. This person will take steps to resolve complaints, including coordinating periodic noise monitoring, if necessary.<br>f. Residents located within 300 feet of project construction will be notified at least seven (7) days in advance of extreme noise-generating activities about the estimated duration of the activity. EBMUD will also send emails to individuals on the Project's mailing list to update them prior to noisy phases.<br>g. At pipeline tie-ins, in an effort to minimize the potential of the work extending beyond the above daytime time limits (8 a.m. and 7 p.m.), the contractor will be required to begin pipe-cutting operations for the hot-tapping connection prior to 9 a.m. or wait until the following morning in order to minimize the potential for pipe-cutting equipment to operate during the evening and nighttime hours. If pipe-cutting equipment must be operated during the nighttime hours at pipeline tie-ins, temporary noise barriers or noise enclosures will be used to minimize disturbance when construction occurs adjacent to residential uses. In addition, operation of trucks and noisier types of heavy equipment will be minimized to the extent feasible. | | | | | |
| **Impact 3.11-2:** Construction activities could result in substantial temporary noise increases that could interfere with activities at nearby noise-sensitive land uses. | **Mitigation Measure NOI-2: Additional Noise Attenuation Measures.**<br>The Noise Control Plan required by Mitigation Measure NOI-1 will also contain measures to reduce potential noise impacts on schools as well as reduce construction noise levels at the jack and bore pipeline crossing. These measures will include but not be limited to the following:<br>***Schools***<br>a. Coordinate with schools located within 250 feet of Project pipeline alignments to schedule construction activities in a manner that minimizes noise impacts on school activities to the extent feasible. The following list of schools within 250 feet of the Project will be confirmed during preparation of the Noise Control Plan.<br>• Willard Middle School (2425 Stuart Street, Berkeley)<br>• Windrush Elementary School (1800 Elm Street, El Cerrito)<br>• Keystone Montessori School (6639 Blake Street, El Cerrito)<br>• Harding School (7115 C Street, El Cerrito)<br>• St. John the Baptist School (11156 San Pablo Avenue, El Cerrito)<br>• Richmond High School (1250 23rd Street, Richmond) | X | X | X | X | Significant and Unavoidable. |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

<table>
<tr><th rowspan="2">ENVIRONMENTAL IMPACT</th><th rowspan="2">MITIGATION MEASURES</th><th colspan="4">MITIGATION MEASURES APPLICABLE[a]</th><th rowspan="2">SIGNIFICANCE AFTER MITIGATION</th></tr>
<tr><th>W.B</th><th>W.E</th><th>C.E/R</th><th>C.R/S</th></tr>
<tr><td colspan="7">NOISE (cont.)</td></tr>
<tr><td>Impact 3.11-2 (cont.)</td><td>Jack and Bore Pipeline Crossing<br>b. Noise barriers or enclosures will be used as necessary to ensure that noise from the boring jack power unit/generator does not exceed 70dBA (Leq) speech interference threshold for more than 10 consecutive work days at the closest noise-sensitive receptors.<br>Mitigation Measure NOI-3: Nighttime Construction Measures.<br>The Noise Control Plan required by Mitigation Measure NOI-1 will include a provision to provide alternative lodging for residents, if requested, that are adversely affected by nighttime pipeline tie-in construction or by nighttime construction at intersections when required by encroachment permit conditions; this measure would only be used if nighttime construction occurs. EBMUD will make a concerted attempt to notify residents located within 400 feet of potential nighttime project construction at least ten (10) days in advance. Notified residents may request alternative lodging for the night(s) of the potential nighttime construction from EBMUD; alternative lodging will consist of a standard room at a hotel located within 6 miles of the affected residence or as close as feasible. Alternative lodging will be provided and approved by EBMUD the day before the known nighttime construction would occur, or sooner, based upon the types of construction activities that may occur during the nighttime hours (10:00 p.m. to 7:00 a.m.).</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Impact 3.11-3: Construction activities could result in excessive groundborne vibration.</td><td>Mitigation Measure NOI-4: Vibration Limits<br>Construction practices will be utilized that do not generate vibration levels at the closest structures above the following thresholds:<br><table><tr><th>Category</th><th>Maximum Amplitude</th></tr><tr><td colspan="2">Cosmetic Damage – Residential and Commercial Buildings</td></tr><tr><td>Transient or Intermittent Sources</td><td>0.5 in/sec PPV</td></tr><tr><td>Continuous Vibratory Sources</td><td>0.4 in/sec PPV</td></tr><tr><td>All Vibratory Sources Located in Areas of Very High Liquefaction Susceptibility, as Depicted in Figure 3.7-4</td><td>0.1 g (peak acceleration), or 0.2 in/sec PPV at 30 Hz</td></tr></table></td><td>X</td><td>X</td><td>X</td><td>X</td><td>Less than Significant.</td></tr>
</table>

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] W.B | W.E | C.E/R | C.R/S | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| **NOISE (cont.)** | | | | | | |
| **Impact 3.11-3** (cont.) | The following measures, at a minimum, will be employed to ensure these thresholds are met:<br>***Pipeline, Tie-in, and Creek Crossing Construction***<br>a. Vibration monitoring will be conducted for the first 500 feet of pipeline construction for each segment to confirm vibration levels do not exceed the above vibration thresholds. If vibration levels exceed the limits of this mitigation measure, then construction practices will be modified (i.e. use smaller types of construction equipment, operate the equipment in a manner to reduce vibration, or use alternate construction methods), and monitoring will continue for an additional 200 feet or until construction practices meet the required vibration levels. The monitoring in this mitigation measure will be repeated if the construction methods change in a manner that would increase vibration levels, or when structures are closer to the limits of construction than previous vibration monitoring have confirmed is below the vibration thresholds.<br>b. Smaller vibratory compactors and/or non-compacting materials (i.e., some types of gravel) will be used to minimize vibration levels during repaving activities where needed to meet vibration limits.<br>c. Sheet piles will be installed with vibratory drivers instead of impact drivers where feasible. Impact sheet pile installation will be prohibited within 55 feet of the closest structures. Vibration monitoring will be conducted within 100 feet of any buildings where impact sheet pile installation occurs, and within 60 feet of any building where vibratory sheet pile installation occurs to ensure that the above applicable performance standard is not exceeded. If vibration levels exceed the applicable threshold, the contractor will use alternative construction methods.<br>d. For the pipe bridge supports, pile holes will be pre-drilled to minimize or avoid the use of impact pile drivers.<br>***Areas Susceptible to High/Very High Liquefaction Hazards***<br>e. Soil settlement and vibration monitoring will be conducted at the closest structures when vibratory equipment is operated in areas with High to Very High liquefaction susceptibility to ensure that the above performance standard is not exceeded.<br>***Preconstruction Surveys and Monitoring***<br>f. With permission and at the request of homeowners, EBMUD will conduct a preconstruction survey of homes, other sensitive structures, hardscaping, hillsides, and slide areas adjacent to the pipeline alignments, for potential effects due to vibration-generating activities. EBMUD will respond to any claims by inspecting the affected property promptly. Any new cracks or other changes in structures will be compared to preconstruction conditions and a determination made as to whether | | | | | |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] | | | | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| | | W.B | W.E | C.E/R | C.R/S | |
| **NOISE (cont.)** | | | | | | |
| **Impact 3.11-3** (cont.) | the proposed Project could have caused such damage. In the event that the Project is demonstrated to have caused the damage, EBMUD will coordinate with the owner to have the damage repaired to the pre-existing condition. | | | | | |
| **Impact 3.11-4**: Project operations would not result in a substantial permanent increase in ambient noise levels in the project vicinity or significant impacts related to the exposure of people to noise levels in excess of local noise ordinance limits. | None Required. | | | | | |
| **RECREATION** | | | | | | |
| **Impact 3.12-1**: Construction of the Project may disrupt access to parks and other recreational facilities. | None Required. | | | | | |
| **Impact 3.12-2**: Construction of the Project may result in the removal of trees and other park facilities. | **Mitigation Measure REC-1**: **Restoration of 23rd Street Pocket Park.**<br>If the jack and bore pit required for the Central Pressure Zone Pipeline (Richmond/San Pablo) crossing of Wildcat Creek is located in the City of San Pablo's park adjacent to 23rd Street, the pit and construction activities will be located to avoid trees to the extent feasible. After completion of construction activities, the park will be restored to pre-project conditions. Restoration will include replanting any trees or other vegetation and replacing any other park amenities (park benches, sidewalks, signage etc) that were removed during construction. To allow for access to the pipeline, replanted trees will not be located within 20 feet of the pipeline. | | | | X | Less than Significant. |
| **TRANSPORTATION AND TRAFFIC** | | | | | | |
| **Impact 3.13-1:** Closure of travel lanes during project construction would temporarily reduce roadway capacity and increase traffic delays on area roadways, causing temporary and intermittent conflicts with all modes of travel, but the effects would be of short duration and limited in magnitude. | **Mitigation Measure TRA-1:**<br>a. ***Intersection Traffic Control*****.** A flagger will be deployed at the Claremont Avenue/ Hillcrest Boulevard/Brookside Drive intersection to control westbound traffic during the p.m. peak period. This would minimize the impact of the pipeline installation project.<br>*b.* ***Intersection Traffic Control.*** *Flaggers will be deployed at the Richmond Street/Central Avenue and Richmond Street/Fairmount Avenue intersections to control traffic during peak periods.* | X | | | | Significant and Unavoidable for Wildcat Pipeline (El Cerrito) and Central Pressure Zone Pipeline (El Cerrito/ Richmond).<br>Less than Significant for other pipelines. |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] | | | | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| | | W.B | W.E | C.E/R | C.R/S | |
| **TRANSPORTATION AND TRAFFIC (cont.)** | | | | | | |
| **Impact 3.13-1** (cont.) | c. ***Intersection Traffic Control*.** Prohibit left-turns from San Pablo Avenue to 23rd Street or Road 20 during the p.m. peak period when construction activities require lane closures. This can be accomplished using cones and changeable message signs.<br>d. ***Intersection Traffic Control.*** *Prohibit left-turns from 23rd Street to Rheem Avenue during the p.m. peak period when construction activities require lane closures. This can be accomplished using cones and changeable message signs.* | | | | X | |
| **Impact 3.13-2:** Project construction would potentially have a significant impact on access, including access for emergency vehicles. | None Required. | | | | | |
| **Impact 3.13-3:** The proposed Project would not substantially increase hazards due to a design feature or incompatible uses. | None Required. | | | | | |
| **Impact 3.13-4**: Project construction would not substantially limit access to adjacent roadways and land uses due to construction within roadways. | **Mitigation Measure TRA-2:**<br>a. ***Advance Notification of Construction*.** Residents and business owners located within 300 feet of project construction will be notified in advance of activities requiring road closures about the estimated schedule and duration of the activity. EBMUD will also send emails to individuals on the Project's mailing list to update them prior road closures.<br>b. ***Road Blocks and Trenches*.** Road blocks will be removed and open trenches covered at the end of the work day on a daily basis to provide access to residents. However, a portion of the parking zones will be retained for the storage of construction equipment on a daily basis.<br>c. ***Sidewalk Access*.** Sidewalk access will be maintained on one side of the street during construction. | X | X | X | X | Significant and Unavoidable for Central Pressure Zone Pipeline (El Cerrito/ Richmond)<br>Less than Significant for other pipelines. |
| | d. **Alternate Parking Solutions for Residents.** In the City of Berkeley where their Residential Preferential Parking Program restricts street parking, EBMUD will request the City of Berkeley to provide temporary parking permits for residents to park in other nearby parking permit zones during construction, and EBMUD will, where feasible, work with the owners of parking facilities near the pipeline alignments to provide parking for residents affected by construction. | X | | | | |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] | | | | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| | | W.B | W.E | C.E/R | C.R/S | |
| **TRANSPORTATION AND TRAFFIC (cont.)** | | | | | | |
| **Impact 3.13-5:** Project construction would not substantially impair access to alternative transportation facilities (public transit, bicycle, or pedestrian facilities), although it would temporarily decrease the performance of such facilities. | **Mitigation Measure TRA-3:**<br>a. ***Notification of Transit Changes.*** EBMUD will coordinate with AC Transit to provide the notification to transit patrons. EBMUD will provide AC Transit with 14 days notice of bus stop closures. AC Transit will communicate alternate bus stop locations to their customers. | X | X | X | X | Significant and Unavoidable for Central Pressure Zone Pipeline (El Cerrito/ Richmond)<br>Less than Significant for other pipelines. |
| | b. ***AC Transit Coordination.*** EBMUD will coordinate with AC Transit to relocate bus stops and/or reroute affected transit services via parallel streets during construction. This would minimize the distance that bus patrons would need to walk to access the buses due to bus stops on affected streets being temporarily closed. | | X | | | |
| | c. ***AC Transit Coordination.*** EBMUD will coordinate with AC Transit to relocate bus stops and/or reroute affected transit services via parallel streets during construction along San Pablo Avenue. This would minimize the distance that bus patrons would need to walk to access the buses due to bus stops on San Pablo Avenue being temporarily closed.<br>d. ***Crosswalks.*** Where possible, the contractor will implement staged construction across the intersections along San Pablo Avenue to make either the north or south crosswalk available at any one time during construction. This would minimize the need for pedestrians to walk an entire block to use the adjacent crosswalk to cross San Pablo Avenue. | | | X | | |
| | *e.* ***Bicycle Traffic Management.*** The contractors will mount temporary "share the road" signs within the construction zone along San Pablo Avenue, or will apply for a temporary permit to allow cyclists to use the sidewalk to bypass the construction area where allowed by the local jurisdiction. | | | X | | |
| | f. ***Road Closure Notification.*** During Garvin Avenue and Hellings Avenue closures, notification will be provided through signing that pedestrians need to use alternative locations to cross 23rd Street.<br>*g.* ***Sidewalk Closure.*** Contractors will minimize or avoid closing multiple crosswalks at closely-spaced intersections at Dover Avenue, between Visalia Avenue and Lincoln Avenue, and between Grant Avenue and Clinton Avenue. | | | | X | |
| **CUMULATIVE IMPACTS** | | | | | | |
| **Impact C-1:** Cumulative impacts to scenic vistas and visual character. | Mitigation Measures AES-1 and BIO-1d. | X | X | X | X | Significant and Unavoidable. |
| **Impact C-2:** Cumulative air quality impacts. | Mitigation Measure AIR-1b. | X | X | X | X | Less than Significant. |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] | | | | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| | | W.B | W.E | C.E/R | C.R/S | |
| **CUMULATIVE IMPACTS (cont.)** | | | | | | |
| **Impact C-3:** Cumulative impacts on biological resources. | Mitigation Measures HYD-1, BIO-1a, BIO-1b, BIO-1c, BIO-1d | X | | | X | Less than Significant. |
| **Impact C-4:** Cumulative impacts on historical, archaeological, and paleontological resources. | Mitigation Measures CUL-1, CUL-2 and CUL-3. | X | X | X | X | Less than Significant. |
| **Impact C-5:** Cumulative impacts related to energy consumption and conservation. | None Required. | | | | | |
| **Impact C-6:** Cumulative impacts related to seismic hazards, soil erosion and topsoil, unstable geologic units, and expansive soils, and changes to topography. | Mitigations Measures GEO-2 and NOI-4. | | | | X | Less than Significant. |
| **Impact C-7:** Cumulative impacts related to GHG emissions. | Mitigation Measure AIR-1 | X | X | X | X | Less than Significant. |
| **Impact C-8:** Cumulative impacts related to hazards and hazardous materials. | Mitigation Measures HAZ-1a-cand HAZ-2. | X | X | X | X | Less than Significant. |
| **Impact C-9:** Cumulative impacts on hydrology and water quality. | Mitigation Measure HYD-1 | X | | | X | Less than Significant. |
| **Impact C-10:** Cumulative increases in construction noise and vibration in the vicinity of proposed pipelines. | Mitigation Measures NOI-1, NOI-2, NOI-4.<br>**Mitigation Measure C-1: Coordinated Noise Control Plan During Construction**<br>EBMUD will prepare a coordinated Noise and Vibration Control Plan that outlines noise and vibration controls to ensure that where feasible the 70-dBA speech interference threshold is not exceeded during the daytime hours (7 a.m. to 10 p.m.) for more than two consecutive weeks at one location without at least a one week break between projects and vibration thresholds listed in Mitigation Measure NOI-4 (Vibration Limits) are not exceeded when combined noise and vibration effects from cumulative projects are considered. At locations like the tie-in locations where the Project activities will extended beyond two weeks, EBMUD will attempt to coordinate with the cumulative projects to provide a week long gap between the construction activities. | X | X | X | X | Less than Significant. |
| **Impact C-11:** Cumulative impacts to parks or other recreational facilities. | Mitigation Measure REC-1. | | | | X | Less than Significant. |

**TABLE S-1 (Continued)**
**SUMMARY OF IMPACTS AND MITIGATION MEASURES**

| ENVIRONMENTAL IMPACT | MITIGATION MEASURES | MITIGATION MEASURES APPLICABLE[a] | | | | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|---|---|
| | | W.B | W.E | C.E/R | C.R/S | |
| **CUMULATIVE IMPACTS (cont.)** | | | | | | |
| **Impact C-12:** Cumulative impacts related to increases in traffic and traffic hazards, access, and parking. | Mitigation Measures TRA-1a through 1d, 2a through 2d and 3a through 3g.<br>**Mitigation Measure C-2: Coordinated Traffic Control Plan During Construction**<br>Prior to construction, EBMUD will develop a Coordinated Transportation Management Plan in coordination with the appropriate local government departments in Berkeley, El Cerrito, Richmond, and San Pablo to address the transportation impact of the overlapping construction projects within the vicinity of the West of Hills Project. The coordinated transportation management plan will include, but not be limited to, the following requirements:<br>• Coordination of individual traffic control plans for the project and nearby projects.<br>• Coordination between the contractor and EBMUD in developing circulation and detour plans that include safety features (e.g., signage and flaggers).<br>• Protocols for updating the transportation management plan to account for delays or changes in the schedules of individual projects. | X | X | X | X | Less than Significant. |

a Abbreviations for pipeline alignments: Wildcat Pipeline (Berkeley) – W.B; Wildcat Pipeline (El Cerrito) – W.E; Central Pressure Zone Pipeline (El Cerrito/Richmond) – C.E/R; Central Pressure Zone Pipeline (Richmond/San Pablo) – C.R/S

# S.5 Analysis of Project and Design Alternatives

Alternatives considered in the alternatives analysis were drawn from EBMUD planning reports prepared for the West of Hills area, suggestions made in response to the Notice of Preparation (NOP) and at public meetings held for the West of Hills Northern Pipelines Project, and EIR preparers (based on the environmental impacts described in Chapter 3). A range of alternatives were considered, and those that did not meet most of the basic project objectives or did not avoid or substantially lessen the Project's potential environmental impacts were found to be infeasible and eliminated from further consideration. Based on the potential to reduce potentially significant impacts, the following alternative alignments were chosen for further review:

- ***Wildcat Pipeline (Berkeley)***. An alternative alignment *(*Alternative 3), was selected for the potential to reduce construction related traffic, noise, vibration and air quality related impacts in residential areas by utilizing Telegraph Avenue (a predominately commercial corridor) to a greater extent.
- ***Wildcat Pipeline (El Cerrito)***. An alternative alignment *(*Alternative 2), was selected for the potential to reduce construction related traffic impacts along Richmond Street (a travel corridor) by using parallel streets that carry less traffic.
- ***Central Pressure Zone Pipeline (El Cerrito/Richmond)***. An alternative alignment *(*Alternative 3), was selected for the potential to reduce construction related traffic impacts along San Pablo Avenue by using parallel streets that carry less traffic.
- ***Central Pressure Zone Pipeline (Richmond/San Pablo)***. An alternative alignment *(*Alternative 2), was selected for the potential to reduce construction related traffic impacts along 23rd Street by using parallel streets that carry less traffic.

A comprehensive discussion and analysis of alternatives is included in Chapter 4 of this EIR, Project Alternatives.

This EIR also evaluates optional alignments for portions of two pipelines. These optional alignments are described in Chapter 2, and evaluated in Chapters 3 through 7:

- ***Wildcat Pipeline (Berkeley)***. This EIR evaluates two parallel alignments for a portion of the proposed pipeline within the city of Berkeley – one along Hillegass Avenue and one along Benvenue Avenue.
- ***Central Pressure Zone Pipeline (Richmond/San Pablo)***. This EIR evaluates two locations of a proposed pipe bridge across San Pablo Creek – the proposed alignment within an existing EBMUD utility corridor, and an optional alignment adjacent to San Pablo Avenue.

# S.6 Issues Raised During Public Outreach/Notice of Preparation Scoping Review Period

EBMUD conducted three community meetings in November 2011, to discuss the proposed Project and to solicit public input. **Appendix A** of this EIR presents a description of public outreach efforts. These meetings provided direction for the development of alternatives and the scope of effects to be considered in the EIR.

A variety of issues and concerns were raised in the community outreach process, including issues related to construction scheduling/duration, street repaving, traffic/access during construction, proposed alignments, creek crossings, potential for pipeline leakage and potential for conflicts with other utility lines. These issues were considered during preparation of the Draft EIR and informed the scope of the analysis and the selection of alignments analyzed as project alternatives. **Table S-2** provides a summary of issues raised and where the issue is addressed in the Draft EIR.

**TABLE S-2**
**SUMMARY OF ISSUES RAISED BY THE COMMUNITY AND AGENCIES REGARDING THE SCOPE OF THE EIR**

| Issue Raised in Scoping Comments | Chapter or Section where Addressed/Response |
|---|---|
| Project Description | |
| Describe how EBMUD will repave affected streets after construction is completed. | 2.7 Construction |
| Describe where in the street the pipeline would be located. | The exact location of the pipelines will be determined during the final design of the Project and depends upon where other existing utilities are located in the street. Occasionally, unforeseen conditions may require alignment adjustments. |
| Describe how deep the trench and pipe would be. | 2.7 Construction |
| Describe the soil excavations for the Project. | 2.7 Construction |
| Describe the types of vehicles that would be used, including the types of tires used. | Construction equipment required is identified in Section 2.7 Construction. Equipment would use rubber tires, metal tracks and steel rollers. |
| Describe how the route was determined. | 4. Project Alternatives |
| Describe whether the pipelines would cross over sewer laterals. | Usually the pipeline would go under the laterals. In some cases the sewer lateral will be very deep and the pipelines will be able to cross over the lateral. |
| Project Schedule | |
| The construction period shown for the Wildcat Pipelines (mid-2015 to mid-2017) suggests a much slower rate of progress than described by EBMUD. | 2.7 Construction |
| Describe effects on construction schedule if the pipeline and/or trench needed to be deeper than predicted. | The construction schedule takes into account a range of production rates to account for such variables. See Section 2.7 for details on the construction schedule. |
| Alternative Pipeline Routes | |
| Consider an alternative pipeline alignment to Hillegass Avenue such as Benvenue or Telegraph Avenues. | This EIR fully evaluates the option of using Benvenue Avenue instead of Hillegass Avenue. See Section 2.4 Project Location. Other alternatives are addressed in Chapter 4. Project Alternatives. |
| Analyze alternative alignments to the same level as the preferred alternative. | 4. Project Alternatives |
| The EIR should review more than one alternative and should consider community input. | 4. Project Alternatives |

**TABLE S-2 (Continued)**
**SUMMARY OF ISSUES RAISED BY THE COMMUNITY AND AGENCIES REGARDING THE SCOPE OF THE EIR**

| Issue Raised in Scoping Comments | Chapter or Section where Addressed/Response |
|---|---|
| **Alternative Pipeline Routes (cont.)** | |
| An alignment down Richmond Street in El Cerrito would impact the community. | 3. Environmental Setting, Impacts, and Mitigation Measures<br>4. Project Alternatives |
| Due to its heavy traffic, construction in Richmond Street in El Cerrito would shift traffic to smaller streets. | 3.13 Transportation and Traffic<br>4. Project Alternatives |
| The Wildcat Pipeline (El Cerrito) should go down San Pablo Avenue (instead of the proposed route). | Due to the location of the required tie-in points, routing the Wildcat Pipeline (El Cerrito) in San Pablo Avenue would significantly increase the pipeline length. See Chapter 4. Project Alternatives, for a discussion of alternative routes analyzed. |
| **Construction Impacts** | |
| If the Project requires long workdays, workers could become tired and cut corners, potentially resulting in impacts. | EBMUD will conduct construction inspections to ensure that quality is maintained throughout the Project. Contractors have to pay overtime cost which provides an incentive to work standard days, but longer days can provide flexibility and allow some tasks to be done more efficiently. |
| Describe how the Project would affect the roundabout at Hillegass Avenue and Webster Street in Berkeley. | 3.2 Aesthetics |
| Address how air quality impacts will be mitigated throughout the Project. | 3.3 Air Quality |
| Address how noise impacts will be mitigated throughout the Project and how the Project will comply with Berkeley and Oakland noise ordinances. | 3.11 Noise |
| **Resident Access and Parking** | |
| Consider working with the City of Oakland to allow Berkeley residents to park on nearby Oakland streets during construction. | 3.13 Transportation and Traffic |
| Describe how long access would be affected for each block and residence in the project area. | 2.7 Construction |
| Consider working with the owner of the parking structure at Regent and Webster Streets in Berkeley to allow Permit Area A residents to park for free between 5 pm and 9 am on construction days. | 3.13 Transportation and Traffic<br>4. Alternatives |
| It is unreasonable to ask or expect residents to leave their houses with their cars before construction begins each day. | |
| Analyze potential impacts on access to homes and mobility near construction sites for people with disabilities. | |
| Provide an on-site contact to help residents with access to homes and vehicles during construction. | |
| Describe effects on emergency access during construction. | |
| Consider working with cities to provide on-street parking flexibility in permit areas for residents on affected streets. | |
| Describe how access to Woolsey Street in Berkeley would be affected given the barricade at Hillegass Avenue. | |
| Work with cities to implement existing and/or planned parking enforcement to ease parking congestion. | |

**TABLE S-2 (Continued)**
**SUMMARY OF ISSUES RAISED BY THE COMMUNITY AND AGENCIES REGARDING THE SCOPE OF THE EIR**

| Issue Raised in Scoping Comments | Chapter or Section where Addressed/Response |
|---|---|
| School Impacts | |
| Analyze and mitigate potential disruption impacts of construction near Willard School during the school year, including access for special needs students. | Construction of pipeline segments directly in front of schools would be completed during traditional school breaks (i.e., summer break or winter holiday break).<br>For further details see:<br>2.7 Construction<br>3.11 Noise<br>3.13 Transportation and Traffic |
| Willard Park hosts after-school programs and a summer camp, with buses serving both. | |
| Pipeline construction could affect school bus and special education bus routes along Hillegass Avenue and potentially other streets. | |
| Many schools are located in commuting distance of the El Cerrito segment of the Project, including El Cerrito High School, Fairmont, Harding, and St. Jerome's; Lincoln Avenue is a major route for pedestrians and cars accessing El Cerrito High. | (see response to school impacts above) |
| Traffic | |
| Caltrans may require a Transportation Management Plan or construction traffic impact study prior to construction. | 2.11 Permits and Approvals<br>3.13 Transportation and Traffic |
| The Project may require Caltrans encroachment permits and require traffic mitigation measures to be incorporated into construction plans. | |
| The Project may require Caltrans transportation permits for movement of oversized loads on state roadways. | |
| The Project would result in wear and tear on roads as a result of trucks. | 3.13 Transportation and Traffic |
| Address how traffic impacts will be mitigated throughout the Project. | |
| Will the bicycle routes remain open? If not, will there be detour routes for bicyclists? | |
| Pipeline Hazards | |
| If the Project would cross gas lines, describe the potential safety hazards. | 2. Project Description<br>3.9 Hazards and Hazardous Materials |
| Describe how the Project would avoid existing utilities. | 2. Project Description<br>3.9 Hazards and Hazardous Materials |
| The water table is high along the alignment; address how soils and the water table would be studied before construction begins and how impacts related to this issue would be minimized. | 2. Project Description<br>3.7 Geology and Soils<br>3.10 Hydrology and Water Quality |
| There is poor soil stability in the project area (Berkeley). | 3.7 Geology and Soils |
| Analyze the potential impacts related to seasonal flooding in Harwood Creek in Berkeley. | 3.10 Hydrology and Water Quality |
| Flooding Hazards | |
| Address how EBMUD will prevent a water line break during and after construction, and during seismic events. | 2. Project Description<br>3.7 Geology and Soils |
| Analyze the potential of a water line break during or after construction and the potential flooding effects on homes downhill. | 3.10 Hydrology and Water Quality |
| The Project could interfere with homeowners pumping water from their cellars into the street. | |

**TABLE S-2 (Continued)**
**SUMMARY OF ISSUES RAISED BY THE COMMUNITY AND AGENCIES REGARDING THE SCOPE OF THE EIR**

| Issue Raised in Scoping Comments | Chapter or Section where Addressed/Response |
|---|---|
| **Water Supply Impacts** | |
| How would water supply or water pressure in the project area be affected by the Project? | 2. Project Description |
| **Coordination of Work** | |
| Coordinate with other utilities to make repairs concurrently with project construction. | EBMUD coordinates construction activities with other utilities throughout the planning process, and with affected cities through the encroachment permit process. |
| Construction projects should be grouped to minimize impacts from construction and reduce paving maintenance. | |
| Consider using "low-noise asphalt" and/or permeable paving. | EBMUD would restore the paving section to its original condition using traditional asphalt material. Permeable paving requires drain rock and drainage facilities to be installed underneath the road section that are beyond the scope of repairing a trench section. |
| **Pipeline Operation and Maintenance** | |
| Analyze operational impacts related to testing, monitoring, scheduled maintenance, and emergency repairs of the proposed pipelines. | 3.2 Aesthetics<br>3.3 Air Quality<br>3.4 Biological Resources<br>3.9 Hazards and Hazardous Materials<br>3.10 Hydrology and Water Quality<br>3.11 Noise<br>3.12 Recreation<br>3.13 Transportation and Traffic |
| **Public Outreach** | |
| EBMUD should e-mail information about Project impacts to residents. | For Project status updates and to be added to the mailing list please contact:<br>Michelle Blackwell, Community Affairs Representative II<br>Email: mblackwe@ebmud.com<br>Phone: (510) 287-2053 |
| Describe future public outreach and availability of Project information and maps. | Section 1.2 California Environmental Quality Act Process |

In accordance with Sections 15063 and 15082 of the CEQA Guidelines, EBMUD prepared a NOP for this EIR. The NOP provided a general description of the proposed Project, a review of the proposed Project location, and a preliminary list of potential environmental impacts. The NOP was published on February 27, 2012 and the required 30-day review/comment period expired on March 29, 2012. The NOP is attached as **Appendix B**.

## S.7 Resources Not Evaluated Further in the EIR

Pursuant to Sections 15128 and 15083 (a) of the CEQA Guidelines, this EIR analyzed only those effects identified as potentially significant in the Initial Study prepared for the proposed Project. These effects include: Aesthetics/Visual Quality; Air Quality, Biological Resources; Cultural Resources; Geology/Soils, Greenhouse Gas Emissions, Hazards/Hazardous Materials, Hydrology/Water Quality, Noise and Vibration; Population/Housing, Transportation/Traffic and Energy.

Effects found to not be significant and excluded from this EIR include Agriculture Resources, Land Use/Planning, Mineral Resources, Public Services, and Utilities/Service Systems.

## S.8 Organization of the EIR

This Draft EIR has been organized into the following chapters:

1. **Introduction.** This chapter discusses the CEQA process and the purpose of the EIR.

2. **Project Description.** This chapter provides an overview of the West of Hills Northern Pipelines Project, describes the need for and objectives of the Project, and describes the proposed construction process in detail.

3. **Environmental Setting, Impacts, and Mitigation Measures.** This chapter presents a description of the physical and regulatory setting of the West of Hills Northern Pipelines Project, describes impacts that could result from implementation of the Project, and identifies measures to mitigate those impacts. In order of occurrence, the resource sections addressed include:

   - Aesthetics
   - Air Quality
   - Biological Resources
   - Cultural Resources
   - Energy
   - Geology and Soils
   - Greenhouse Gas Emissions
   - Hazards and Hazardous Materials
   - Hydrology and Water Quality
   - Noise
   - Recreation
   - Transportation and Traffic

4. **Project Alternatives.** This chapter presents an overview of the alternatives development and evaluation process including alternatives of the proposed Project and the "No Project" alternative.

5. **Cumulative Impacts, Growth Inducement and Other Topics Required by CEQA.** This chapter identifies and describes the potential for the West of Hills Northern Pipelines Project, in combination with other projects in the vicinity, to contribute to significant cumulative impacts.

6. **Growth Inducement Potential and Secondary Effects of Growth.** This chapter discusses the growth-inducing impacts of the proposed Project and characteristics that directly or indirectly foster growth.

7. **Significant and Unavoidable Impacts and Irreversible Environmental Changes.** This chapter identifies significant and unavoidable impacts and irreversible environmental changes resulting from implementation of the proposed Project.

8. **Report Preparers.** This chapter identifies those involved in preparing this Draft EIR.

# CHAPTER 1
# Introduction

## 1.1 Purpose of the EIR

EBMUD, as the lead agency, has prepared this Draft EIR for the West of Hills Northern Pipelines Project (Project) in compliance with CEQA Statutes[1] and the CEQA Guidelines[2]. An EIR is a public document that identifies and evaluates the potential environmental effects of a project, recommends mitigation measures to lessen or eliminate adverse impacts, and examines feasible alternatives to a project. The impact analyses in this report are based on a variety of sources; references for these sources are listed at the end of each technical section. The information contained in this EIR and public comments on the content of this EIR will be reviewed and considered by the EBMUD Board of Directors prior to the ultimate decision to approve, disapprove, or modify the proposed Project.

## 1.2 California Environmental Quality Act Process

### 1.2.1 Public Scoping/Notice of Preparation

EBMUD conducted three community meetings in November 2011, to discuss the proposed Project and to solicit public input. Appendix A of this EIR presents a description of public outreach efforts. These meetings provided direction for the development of alternatives and the scope of effects to be considered in the EIR.

A variety of issues and concerns were raised in the community outreach process, including issues related to construction scheduling/duration, street repaving, traffic/access during construction, proposed alignments, creek crossings, potential for pipeline leakage and potential for conflicts with other utility lines. These issues were considered during preparation of the Draft EIR and informed the scope of the analysis and the selection of alignments analyzed as project alternatives.

In accordance with Sections 15063 and 15082 of the CEQA Guidelines, EBMUD prepared a NOP for this EIR. The NOP provided a general description of the proposed Project, a review of the project location, and a preliminary list of potential environmental impacts. The NOP was

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1 Public Resources Code 21000-21177.

2 California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387.

published on February 27, 2012 and the required 30-day review/comment period expired on March 29, 2012. The NOP is attached as Appendix B.

## 1.2.2 Resources Not Further Evaluated in this EIR

Section 15128 of the CEQA Guidelines addresses Effects Not Found To Be Significant.

> "An EIR shall contain a statement indicating the reasons that various possible significant effects were found not to be significant and were therefore not discussed in detail in the EIR. Such statement may be contained in an attached copy of an initial study."

Section 15083 Early Public Consultation

> "(a) Scoping has been helpful to agencies in identifying the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in an EIR and in eliminating from detailed study issues found not to be important."

Pursuant to Sections 15128 and 15083 (a) of the CEQA Guidelines, this EIR analyzed only those effects identified as potentially significant in the Initial Study prepared for the proposed Project. These effects include: Aesthetics/Visual Quality; Air Quality, Biological Resources; Cultural Resources; Geology/Soils, Greenhouse Gas Emissions, Hazards/Hazardous Materials, Hydrology/Water Quality, Noise and Vibration; Population/Housing, Transportation/Traffic and Energy.

Effects found to not be significant and excluded from this EIR include Agriculture Resources, Land Use/Planning, Mineral Resources, Public Services, and Utilities/Service Systems. The Initial Study is available on EBMUD's website at: http://www.ebmud.com/about-ebmud/news/project-updates/west-hills-northern-pipelines-project.

## 1.2.3 Draft EIR

This Draft EIR will be made available to local, state, and federal agencies and to interested organizations and individuals who may want to review and comment on the report. The Notice of Availability of this Draft EIR will also be sent directly to every agency, person, or organization that commented on the NOP or requested to be informed of project activities during the three public outreach meetings. This notice will identify the time and location of public meetings where EBMUD will summarize the findings of the Draft EIR.

The publication of the Draft EIR marks the beginning of a mandatory 45-day public review period. During the review period, written comments should be emailed, mailed or hand delivered to:

> Timothy McGowan, Associate Civil Engineer, Project Manager
> East Bay Municipal Utility District
> 375 Eleventh Street (Mail Slot 701)
> Oakland, CA 94607-4240
> WOHNP@ebmud.com

## 1.2.4 Final EIR

Written comments received on this Draft EIR will be addressed in a Response to Comments document that together with this Draft EIR will constitute the Final EIR. The Response to Comments document will also set forth any changes to the Draft EIR analysis and mitigation measures resulting from public and agency input.

The EBMUD Board of Directors will consider certification of the Final EIR at a regularly scheduled Board meeting in Fall 2013, and as part of this process will adopt findings in accordance with CEQA. Upon certification, EBMUD may proceed with project approval actions, including design and construction of the proposed Project.

CEQA requires that the lead agency neither approve nor implement a project without determining whether the project's significant environmental effects have been reduced to a less-than-significant level, essentially "eliminating, avoiding, or substantially lessening" the expected impacts. If the lead agency approves a project that will result in the occurrence of significant environmental impacts that have not been mitigated to a less-than-significant level, the agency must state the reasons for its action in writing. This Statement of Overriding Considerations must be included in the record of project approval.

## 1.2.5 Mitigation Monitoring and Reporting

CEQA requires lead agencies to adopt a Mitigation Monitoring and Reporting Program (MMRP) incorporating those changes to the project that have been adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment. The CEQA Guidelines do not require that the specific reporting or monitoring program be included in the EIR. However, throughout this EIR, proposed mitigation measures have been clearly identified and presented in language that will facilitate establishment of a monitoring program.

Furthermore, comments received during the public review period on the mitigation measures and their implementation will also be considered for inclusion in the MMRP. EBMUD will comply with all adopted measures in the MMRP. Project design and construction mitigation measures will generally be included in the contract specifications and drawings and monitored by EBMUD staff to ensure completion.

# CHAPTER 2
# Project Description

## 2.1 Overview

The West of Hills Northern Pipelines Project involves the construction and operation of four new transmission pipeline segments in the cities of Berkeley, El Cerrito, Richmond, and San Pablo (**Figure 2-1**). These proposed pipelines would increase water transmission capacity to customers located in parts of north Oakland, Berkeley, Albany, El Cerrito, Richmond, San Pablo, Pinole, Hercules, and the unincorporated communities of West Contra Costa including Crockett.

The proposed pipeline segments are:

- **Wildcat Pipeline (Berkeley).** A 48-inch diameter pipeline, approximately 1.5 miles long, located in the city of Berkeley, Alameda County.

- **Wildcat Pipeline (El Cerrito).** A 36-inch diameter pipeline, approximately 2.5 miles long, located in the city of El Cerrito, Contra Costa County.

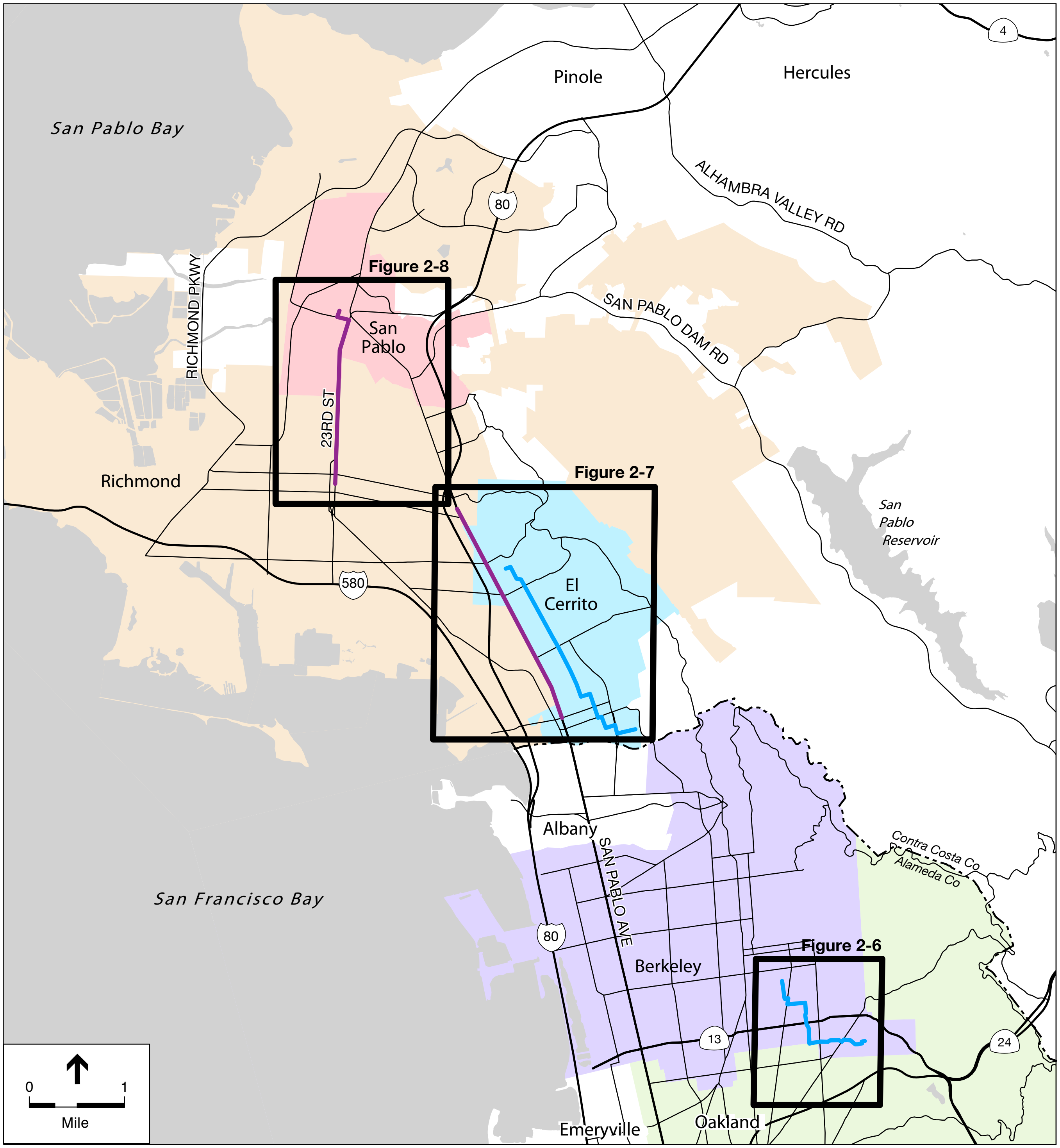
- **Central Pressure Zone Pipeline (El Cerrito/Richmond).** A 36-inch diameter pipeline, approximately 2.5 miles long, located in the cities of El Cerrito and Richmond, Contra Costa County.

- **Central Pressure Zone Pipeline (Richmond/San Pablo).** A 36-inch diameter pipeline, approximately 1.9 miles long, located in the cities of Richmond and San Pablo, Contra Costa County.

This EIR evaluates the construction and operation of these proposed pipelines at a project level of detail.

## 2.2 Project Background

The West of Hills Northern Pipelines Project involves expanding the transmission of treated water north from the EBMUD's Claremont Tunnel (which delivers treated water from the Orinda Water Treatment Plant) through Berkeley, El Cerrito, San Pablo, and Richmond. This section discusses EBMUD's water service operations and describes the facilities involved in the proposed Project.




SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-1**
Project Location

## 2.2.1 Service Area

EBMUD provides water service to 20 incorporated cities and 15 unincorporated areas in Alameda and Contra Costa Counties. The water is conveyed to customers via a network of raw water reservoirs, aqueducts, water treatment plants (WTPs), transmission mains, and distribution facilities stretching from the foothills of the Sierra Nevada to the San Francisco Bay Area (**Figure 2-2**). The Oakland-Berkeley Hills divide EBMUD's service area into two major geographical areas: the West of Hills and East of Hills service areas. The West of Hills service area spans from the city of Crockett to portions of the city of Hayward (EBMUD 2010).

## 2.2.2 Overview of Existing Water System Operations

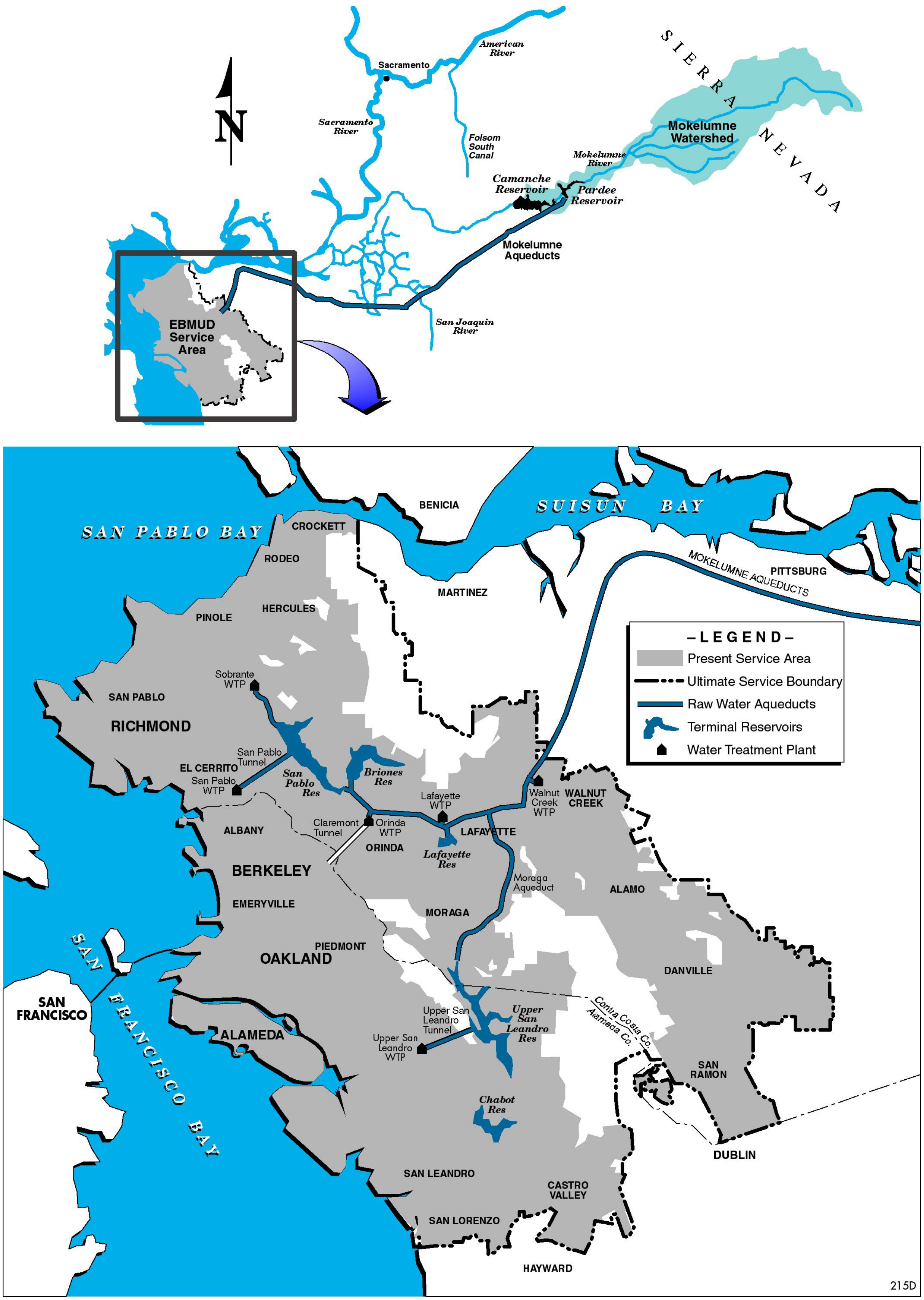
### Water Supply

EBMUD's principal water source is the Mokelumne River watershed, a 575-square mile area of the Sierra Nevada foothills in Alpine, Amador, and Calaveras Counties. Mokelumne River water is stored at the Pardee and Camanche Reservoirs, about 40 miles northeast of the city of Stockton. Raw water flows by gravity via the Mokelumne Aqueducts from Pardee Reservoir to the Bay Area. Additional water (less than 10 percent of total supply) comes from local watersheds in Alameda and Contra Costa Counties. During droughts, EBMUD is able to draw on water from the Sacramento River via the Freeport Regional Water Project, which connects to the Mokelumne Aqueducts (EBMUD 2011).

### Water Treatment

EBMUD operates five WTPs: the Walnut Creek, Lafayette, Orinda, Sobrante, and Upper San Leandro WTPs. EBMUD also owns a sixth WTP, the San Pablo WTP, a facility used only during planned outages of key facilities such as the Claremont Tunnel. **Figure 2-3** depicts the service area boundaries for the five WTPs (based on summer demand conditions) as well as the major transmission mains that carry treated water. The Orinda, Sobrante, and Upper San Leandro WTPs serve the West of Hills area. There is substantial overlap in the service areas of the Sobrante, Orinda, and Upper San Leandro WTPs as well as between the service areas of the Lafayette and Orinda WTPs. This overlap notwithstanding, on any given day, production from one WTP could offset some or all of the production from another depending on actual demands and daily operation choices. In the late spring, summer, and fall, all but the San Pablo WTP would normally be operated to safely meet demands (EBMUD 2010).

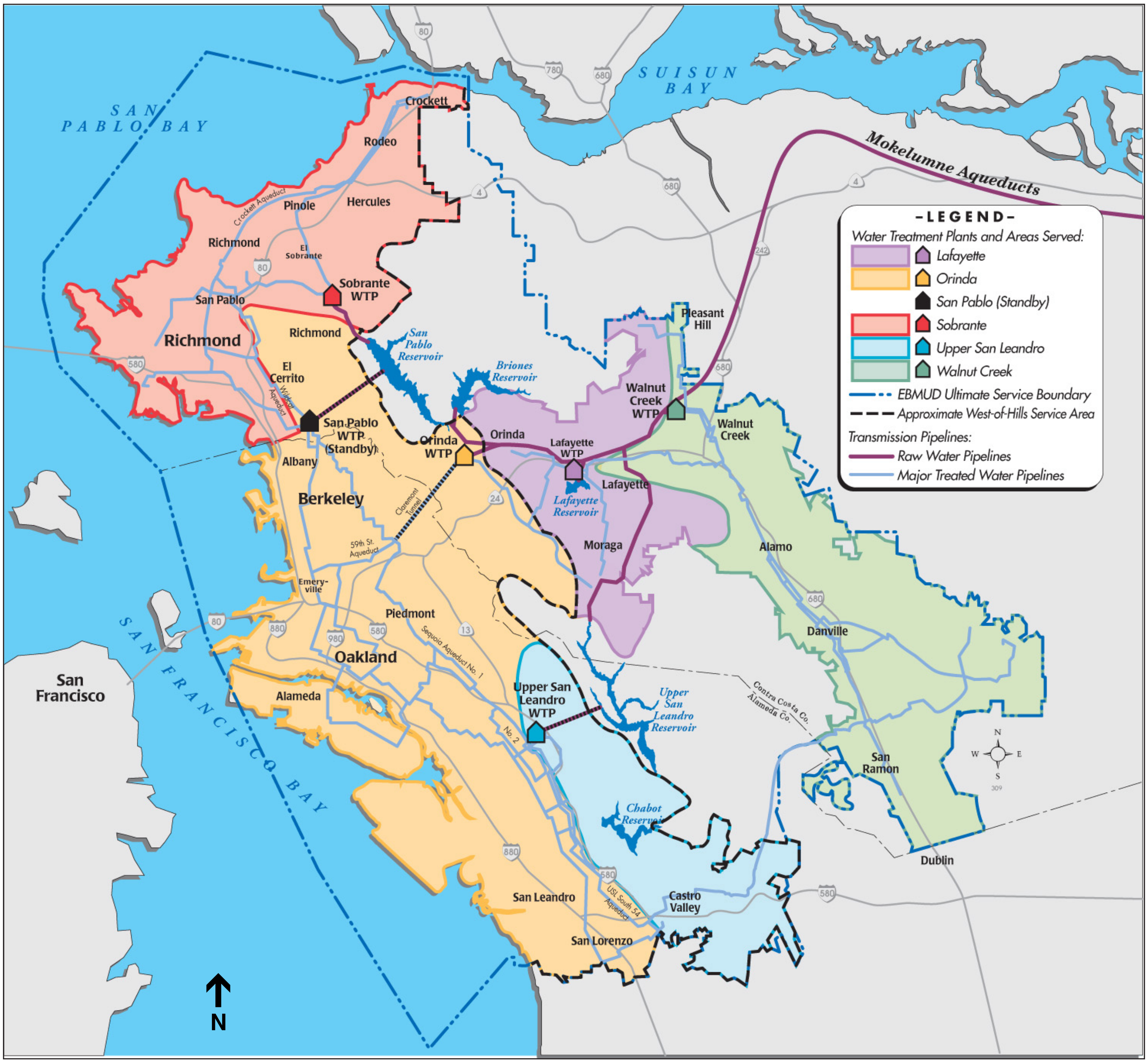
During the winter, the Orinda WTP has sufficient capacity to serve the entire West of Hills distribution system because water consumption decreases as customers significantly reduce landscape irrigation and reduce other outdoor use. As the water demand decreases, first the Upper San Leandro WTP and then the Sobrante WTP are taken off-line, because the water treatment costs are significantly lower at the Orinda WTP given its direct gravity discharge into the distribution system owing to its plant elevation. EBMUD takes the Upper San Leandro WTP off-line when system demands in the West of Hills service area decrease to about 160 mgd and takes the Sobrante WTP off-line when demand drops to about 145 mgd (EBMUD 2010).




SOURCE: EBMUD

EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-2**
EBMUD Service Area




NOTE: Represents summer demand conditions.

SOURCE: EBMUD

EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-3**
Water Treatment Plant Service Areas

The three WTPs that serve the West of Hills area are described below (EBMUD 2010):

- **Orinda Water Treatment Plant.** The Orinda WTP treats water directly from Pardee Reservoir via the Lafayette Aqueducts, and provides treated water to the West of Hills service area via the Claremont Tunnel. The Orinda WTP also serves the Lamorinda area via the Los Altos Pumping Plant.
- **Sobrante Water Treatment Plant.** The Sobrante WTP treats water from San Pablo Reservoir, a local terminal reservoir, and provides treated water to the northern part of the West of Hills service area (Pinole, Hercules, Richmond, El Sobrante, Rodeo, and Crockett).
- **Upper San Leandro Water Treatment Plant.** The Upper San Leandro WTP treats water from the Upper San Leandro Reservoir, a local terminal reservoir, and provides treated water to the southern part of the West of Hills service area (San Leandro, Castro Valley, and south Oakland).

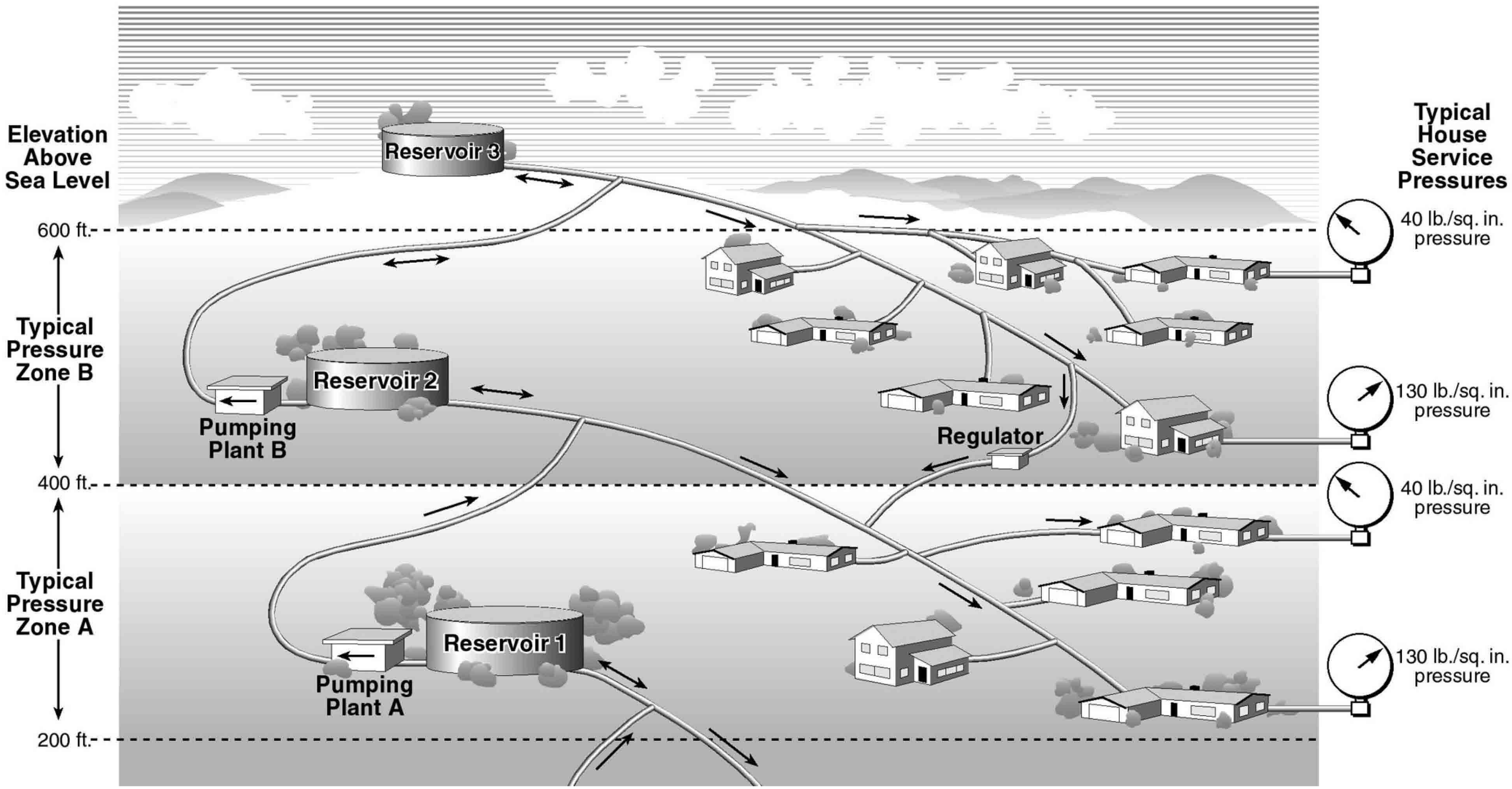
## Treated Water Transmission and Distribution

The WTPs, tunnels, and transmission mains shown in Figures 2-2 and 2-3 constitute the backbone of the EBMUD water treatment and transmission system. After passing through the WTPs, water is distributed to customers throughout EBMUD's service area via a network of transmission and distribution pipelines. This water distribution network contains approximately 4,150 miles of distribution pipelines, 140 pumping plants, and 170 distribution reservoirs (EBMUD 2011). The various units of the service area served by these facilities are called "pressure zones." A typical pressure zone diagram is shown in **Figure 2-4**.

The Central, Aqueduct, and Upper San Leandro Pressure Zones are shown in **Figure 2-5** and are all gravity fed pressure zones. The Aqueduct Pressure Zone serves customers located at an elevation between 100 and 200 feet above sea level, and it receives all of its water from the Orinda WTP via the Claremont Tunnel (the sole means of water conveyance between the Orinda WTP and the West of Hills distribution system). The Upper San Leandro Pressure Zone serves customers located at an elevation between 100 and 275 feet above sea level. During the spring, summer, and fall, the Upper San Leandro Pressure Zone receives all of its water from the Upper San Leandro WTP. During the winter, water is pumped into the Upper San Leandro Pressure Zone through the Fontaine Pumping Plant from the Aqueduct Pressure Zone. The Central Pressure Zone serves customers located at an elevation of 0 to 100 feet above sea level. The Central Pressure Zone receives water from all three WTPs in the warm weather periods (EBMUD 2010).

### *Water Transmission in the West of Hills Area*

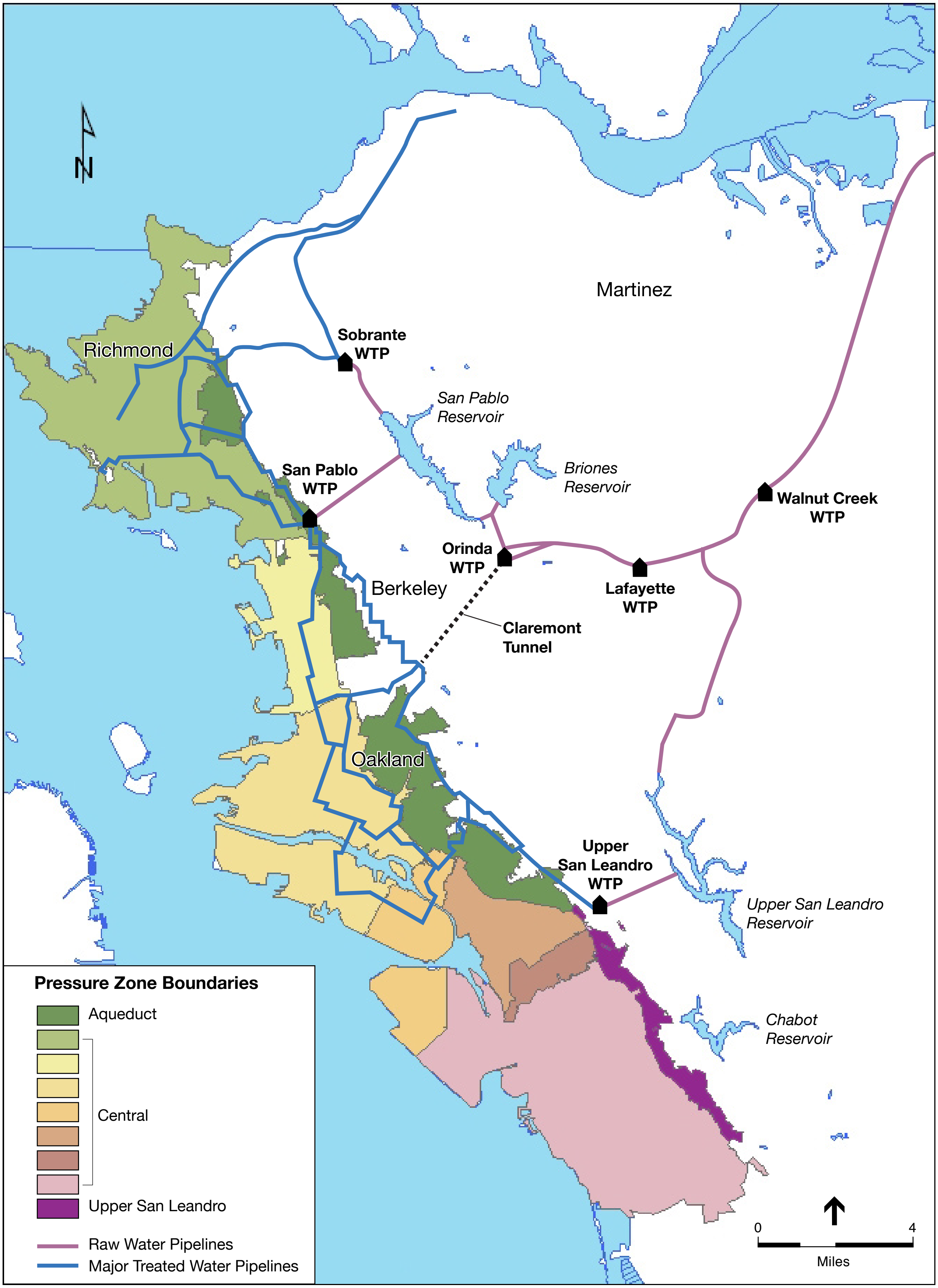
There are five primary water transmission mains in the West of Hills area: the Wildcat Aqueduct, 59th Street Aqueduct, Sequoia Aqueduct, South 54 Aqueduct, and South 30 Aqueduct. The West of Hills Northern Pipelines Project would expand transmission capacity north of the Claremont Tunnel, which is currently provided by the existing Wildcat Aqueduct. The Wildcat Aqueduct extends from the Claremont Tunnel to the Crockett Pumping Plant in San Pablo and supplies water to nine pumping plants and three rate control stations. Two rate control stations (San Pablo and Road 20) supply water to the Central Pressure Zone, and one rate control station (Webster) supplies water to the Claremont Pressure Zone. The largest pumping plant on the Wildcat




SOURCE: EBMUD

EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-4**
Pressure Zone Diagram




SOURCE: EBMUD

EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-5**
West of Hills Pressure Zone Boundaries

Aqueduct is the Crockett Pumping Plant (19.2 mgd); because it is located farthest north, the Crockett Pumping Plant cannot achieve its rated capacity with the current transmission pipelines when the other pumping plants and rate control stations are taking water out of the Wildcat Aqueduct (EBMUD 2010). This is one of several current system deficiencies and primarily related to the decades of demand growth to the north.

# 2.3 Project Need

The West of Hills Northern Pipelines Project is needed to ensure continued reliable water service to customers located west of the Oakland-Berkeley Hills and north of the Claremont Tunnel terminus in Berkeley. The customers served include parts of north Oakland, Berkeley, Albany, El Cerrito, Richmond, San Pablo, Pinole, Hercules and Crockett. The purpose of the West of Hills Northern Pipelines Project is to correct existing deficiencies in water transmission and storage operations, meet projected future water demands, improve system reliability and water quality maintenance challenges, and facilitate repair and replacement of aging infrastructure.

## 2.3.1 Transmission Capacity to Northern West of Hills Area

Some of the major facilities serving the northern West of Hills area have been in service for many decades, during which time the surrounding land use has changed substantially. EBMUD system operators currently face several challenges in moving sufficient water northward from the Claremont Tunnel to the northern West of Hills area, and a number of these are addressed by this Project:

- **Inefficient Pumping Plant Operations.** Pumping plants located along the Wildcat Aqueduct draw water from the pipeline to serve higher-elevation pressure zones located in the hilly portions of Berkeley, El Cerrito, Richmond, Pinole, Hercules and unincorporated Contra Costa County. Currently, the Wildcat Aqueduct does not provide adequate flow at the required pressure to allow for the efficient operation of these pumping plants, meaning that the quantity of water being pumped during a given period of time is less than the design capacity of the pumping plant. This problem is currently acute at the Crockett Pumping Plant because of its position at the northern end of the Wildcat Aqueduct, and it is projected to worsen as water demand increases.

- **Inability to Refill North Reservoir.** During winter months when the Sobrante WTP is off-line, the North Reservoir is filled by water flowing north from the Orinda WTP via the Wildcat Aqueduct. Similar to the Crockett Pumping Plant, North Reservoir is located at the northern end of the Wildcat Aqueduct, and likewise suffers from low water pressure in the Wildcat Aqueduct during certain operational modes. EBMUD standard engineering practice generally calls for maintaining water levels within the uppermost one-third of the reservoir to ensure sufficient water for operations, customer service pressures, and for fire flow. During the winter months, the system cannot adequately fill North Reservoir. This problem is projected to worsen as water demand increases.

- **Pressure Swings.** The low pressure that currently occurs in the northern portion of the Wildcat Aqueduct as the result of high water demand is inconsistent. During periods of lower water demand, when less water is diverted from the Wildcat Aqueduct, the water pressure in the Aqueduct Pressure Zone increases due to lower total flow. Currently, these

> pressure swings can be greater than 30 pounds per square inch (psi) which can create inconsistent pressures for customers. Without additional transmission capacity, the areas affected by pressure swings would expand resulting in increased areas of low pressure and larger pressure fluctuations due to increased water demand. As noted, these variable pressures adversely impact both customers and pumping operations.

The proposed Wildcat Pipeline (Berkeley) and Wildcat Pipeline (El Cerrito) would increase transmission capacity to the northern West of Hills area. The proposed Central Pressure Zone Pipeline (El Cerrito/Richmond) would connect two existing pipelines and transmit additional needed water northward during maximum daytime demand and also during winter operations when the Sobrante WTP is off-line. The proposed Central Pressure Zone Pipeline (Richmond/ San Pablo) would connect two existing pipelines and transmit water southward (from the Sobrante WTP) during the summer and also northward during winter operations when the Sobrante WTP is off-line and (EBMUD 2012).

## 2.3.2 Future Water Demands

EBMUD projects that, despite planned increased levels of water conservation and recycling, potable water demand in its service area will increase; consequently, the operational deficiencies described above will worsen.

To correct these existing transmission capacity problems stated above and ensure the ability to meet projected water demand increases, the West of Hills Northern Pipelines Project has been sized using EBMUD's 2040 Demand Study to accommodate projected increases in water demand due to planned changes in land use within EBMUD's service area (EBMUD 2012). The 2040 Demand Study demand projections are based on an evaluation of water consumption by land use within EBMUD's service area as set forth by the local jurisdictions that EBMUD serves. Water use factors for each land use category (in gallons per day per acre) were calculated using actual water usage data for base year 2005 which were normalized for climate factors. Then demand projections were calculated by applying water usage factors to future land use projections within the service area, as determined from the most recent county and city general plans along with consultations with county and city staffs. Demand projections used in sizing major facilities were then adjusted to account for future planned recycled water and water conservation programs. Land use projections in the general plans were developed during a period of economic expansion, so although water demand projections reflect development planned for the general plans at that time, the timing of development and the associated rate of demand increases may be realized more slowly than the 2040 Demand Study projection. The West of Hills Northern Pipelines Project has been designed to support a future West of Hills maximum day demand up to 315 mgd (EBMUD, 2011).

## 2.3.3 System Reliability

The southern portion of the Wildcat Aqueduct was constructed in 1929 and the northern portion was constructed in 1935. The Wildcat Aqueduct is in continuous use and lacks redundancy in this part of the service area, limiting EBMUD's ability to conduct periodic maintenance and inspections. This pipeline is generally the only source of water for much of Berkeley, Albany, Kensington and the El Cerrito hills. It is only possible to take it out of service for maintenance during the winter when water demand is lower, and portable pumps are required to serve areas that are cut off during a pipeline outage. Because there are few valves on the Wildcat Aqueduct, several thousand feet of pipeline must be taken out of service for even minor maintenance activities.

The West of Hills Northern Pipelines Project would improve system reliability by providing additional transmission capacity, which in turn would allow for more flexible operation of the system pumping plants and rate control stations. The new pipelines would allow existing portions of the Wildcat Aqueduct to be taken out of service in the areas where they are parallel to the new pipeline segments In addition, the additional transmission capacity would allow EBMUD to continue taking the Sobrante WTP off-line for maintenance activities during the winter when water demands are typically lower.

# 2.4 Project Objectives

**Table 2-1** identifies the specific objectives of the Project.

**TABLE 2-1**
**PROJECT OBJECTIVES**

| Category | Project Objectives |
|---|---|
| Operations | ▪ Correct existing pumping deficiencies in accordance with EBMUD standards to improve pumping efficiency and reservoir filling operations<br>▪ Maintain water service pressures and reduce unacceptable swings in water pressure to the extent practicable<br>▪ Maximize the useful life of existing facilities in a manner that maximizes water quality |
| Reliability | ▪ Provide reliable water transmission infrastructure that meets long-term operational and maintenance needs and improves overall efficiency |
| Environmental | ▪ Locate pipelines to avoid areas of geologic hazards and high-priority utilities (high-pressure gas and fuel pipelines) to the extent practicable<br>▪ Minimize length of pipelines to reduce community disruption to the extent practicable |
| Economics | ▪ Minimize life-cycle costs (capital, operating, and maintenance) to EBMUD customers<br>▪ Maximize the useful life of existing facilities in a manner that reduces costs for customers |

## 2.4.1 Who Benefits

The communities that would directly benefit from the continued reliable and cost effective water services advanced by the proposed Project are parts of north Oakland, Berkeley, Albany, El Cerrito, Richmond, San Pablo, Pinole, Hercules, and the unincorporated communities of West Contra Costa including Crockett. (Figure 2-5). Indirectly, any party that does business or has family in the above communities benefits.

# 2.5 Project Location

The proposed pipeline routes, shown in Figure 2-1, are located in the city of Berkeley in Alameda County and the cities of El Cerrito, Richmond, and San Pablo in Contra Costa County. EBMUD screened several potential routes for each of the four pipelines before identifying a preferred route for each pipeline. Screening criteria used in the evaluation included geotechnical considerations (liquefaction potential, active faults, and landslide areas); traffic levels; the number of customers and schools affected, the presence and condition of other utilities (gas, fuel, sewer, and water lines); roadway widths; required construction methods; and cost. Detailed aerial maps of the pipeline alignments are provided in Section 2.13, below.

## 2.5.1 Wildcat Pipeline (Berkeley)

The preferred alignment of the Wildcat Pipeline (Berkeley) is about 8,200 feet long and located in the city of Berkeley (**Figure 2-6**). The southeastern terminus of the proposed alignment is at the intersection of Parkside Drive and Nogales Street, where the Wildcat Pipeline (Berkeley) would connect to an existing 54-inch diameter pipeline. The majority of the alignment is located along The Uplands, Woolsey Street, Hillegass Avenue, Stuart Street, Telegraph Avenue, Ward Street, and Dana Street. The western terminus of the proposed alignment is at the intersection of Dana Street and Parker Street, where the Wildcat Pipeline (Berkeley) would connect to an existing 48-inch diameter transmission pipeline.

### Benvenue Avenue Option

Instead of routing the portion of the Wildcat Pipeline (Berkeley) along Hillegass Avenue, the pipeline could be routed along Benvenue Avenue between Woolsey Street and Stuart Street (Figure 2-6). This EIR evaluates the Benvenue Avenue Option at an equal level of analysis within the specific resource chapters. Based on the analysis in this EIR, EBMUD has determined that the Benvenue Avenue alignment is the environmentally superior alignment and is the preferred alternative (see the discussion in Chapter 4).

## 2.5.2 Wildcat Pipeline (El Cerrito)

The preferred alignment of the Wildcat Pipeline (El Cerrito) is about 13,500 feet long and located in the city of El Cerrito (**Figure 2-7**). The southern terminus of the alignment is at the intersection of Lynn Avenue and San Carlos Avenue where the Wildcat Pipeline (El Cerrito) would connect to an existing 48-inch diameter transmission pipeline in San Carlos Avenue. The proposed alignment proceeds north along Ashbury Avenue, C Street, Behrens Street, Fairmount Avenue, Norvell Street, Lincoln Avenue, Richmond Street and Elm Street to the intersection of Hill Street and Liberty Street, where the Wildcat Pipeline (El Cerrito) would connect to an existing 36-inch diameter transmission pipeline in Liberty Street.

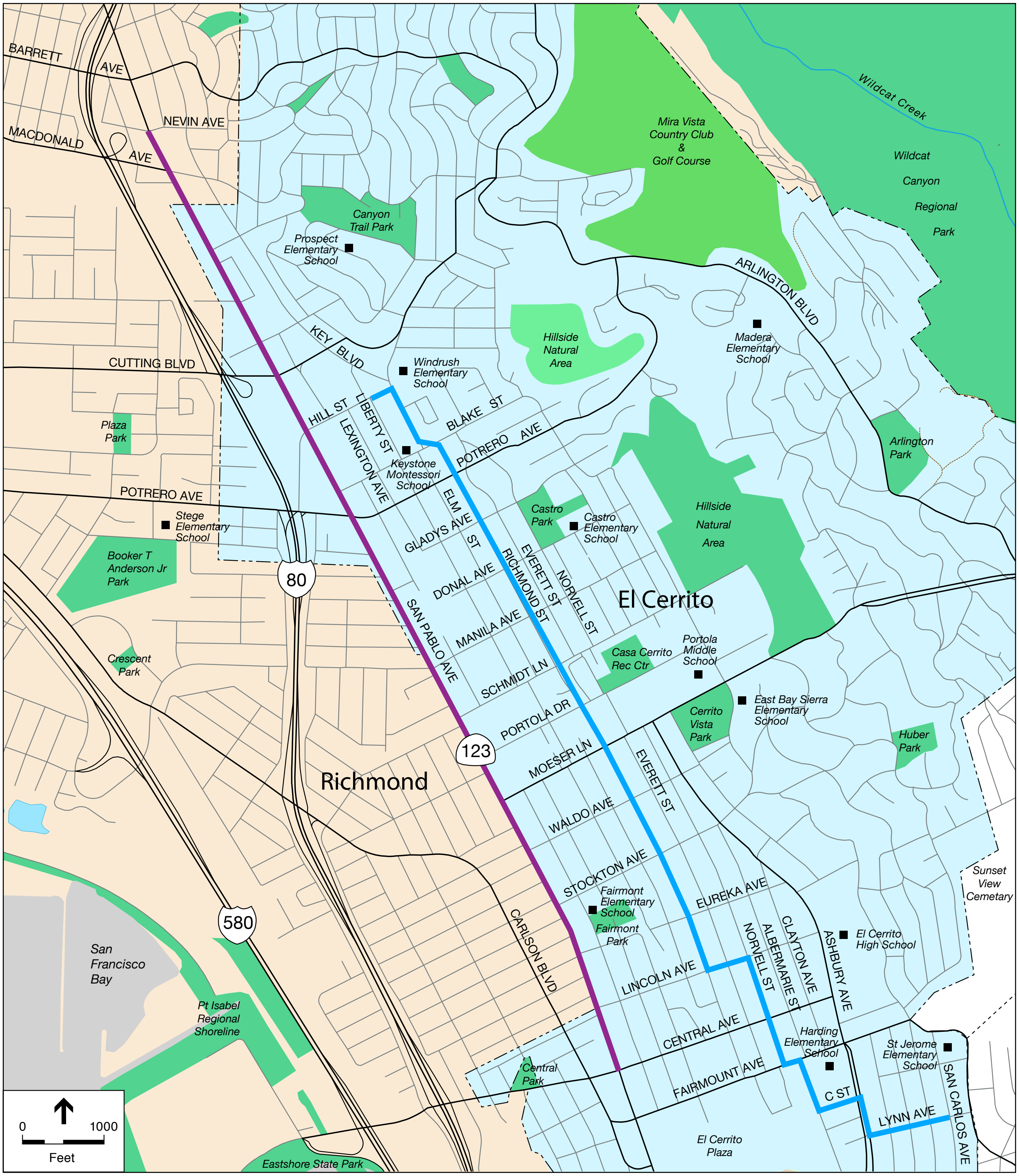

Wildcat Pipeline (Berkeley)

Alternative Alignment (Benvenue Ave)

SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-6**
Wildcat Pipeline (Berkeley)




Wildcat Pipeline (El Cerrito)

Central Pressure Zone Pipeline (El Cerrito/Richmond)

SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-7**
Wildcat Pipeline (El Cerrito) and
Central Pressure Zone Pipeline (El Cerrito)

## 2.5.3 Central Pressure Zone Pipeline (El Cerrito/Richmond)

The preferred alignment of the Central Pressure Zone Pipeline (El Cerrito/Richmond) is about 13,000 feet long and located along San Pablo Avenue in the cities of El Cerrito and Richmond (Figure 2-7). The southern terminus of the alignment is at the intersection of San Pablo Avenue and Central Avenue in the city of El Cerrito where it would connect to the existing 36-inch Central Pressure Zone transmission pipeline in Central Avenue. The proposed alignment proceeds proceed north to the intersection of San Pablo Avenue and Nevin Avenue in the city of Richmond, where the Central Pressure Zone Pipeline (El Cerrito/Richmond) would connect to an existing 36-inch diameter transmission pipeline in Nevin Avenue.

## 2.5.4 Central Pressure Zone Pipeline (Richmond/San Pablo)

The preferred alignment of the Central Pressure Zone Pipeline (Richmond/San Pablo) is about 10,200 feet long and located in the cities of Richmond and San Pablo (**Figure 2-8**). The southern terminus of the alignment is at the intersection of 23rd Street and Nevin Avenue in the city of Richmond where the Central Pressure Zone Pipeline (Richmond/San Pablo) would connect to an existing 36-inch diameter transmission pipeline. The proposed alignment proceeds north along 23rd Street to Brookside Road, crosses San Pablo Creek via a pipe bridge within an existing EBMUD utility corridor consisting of two EBMUD-owned properties (Assessor's Parcel Numbers [APN] 411-282-002 and 412-300-001, totaling 0.28 acres), and ends at the intersection of Road 20 and 21st Street in the city of San Pablo, where the Central Pressure Zone Pipeline (Richmond/San Pablo) would connect to an existing 48-inch diameter transmission pipeline (**Figure 2-9**). Where the pipeline alignment crosses Wildcat Creek, construction would be accomplished by jack and bore (described in Section 2.7.2 below). The jacking pit would be located within a park owned by the City of San Pablo that is located on 23rd Street on the north side of Wildcat Creek.

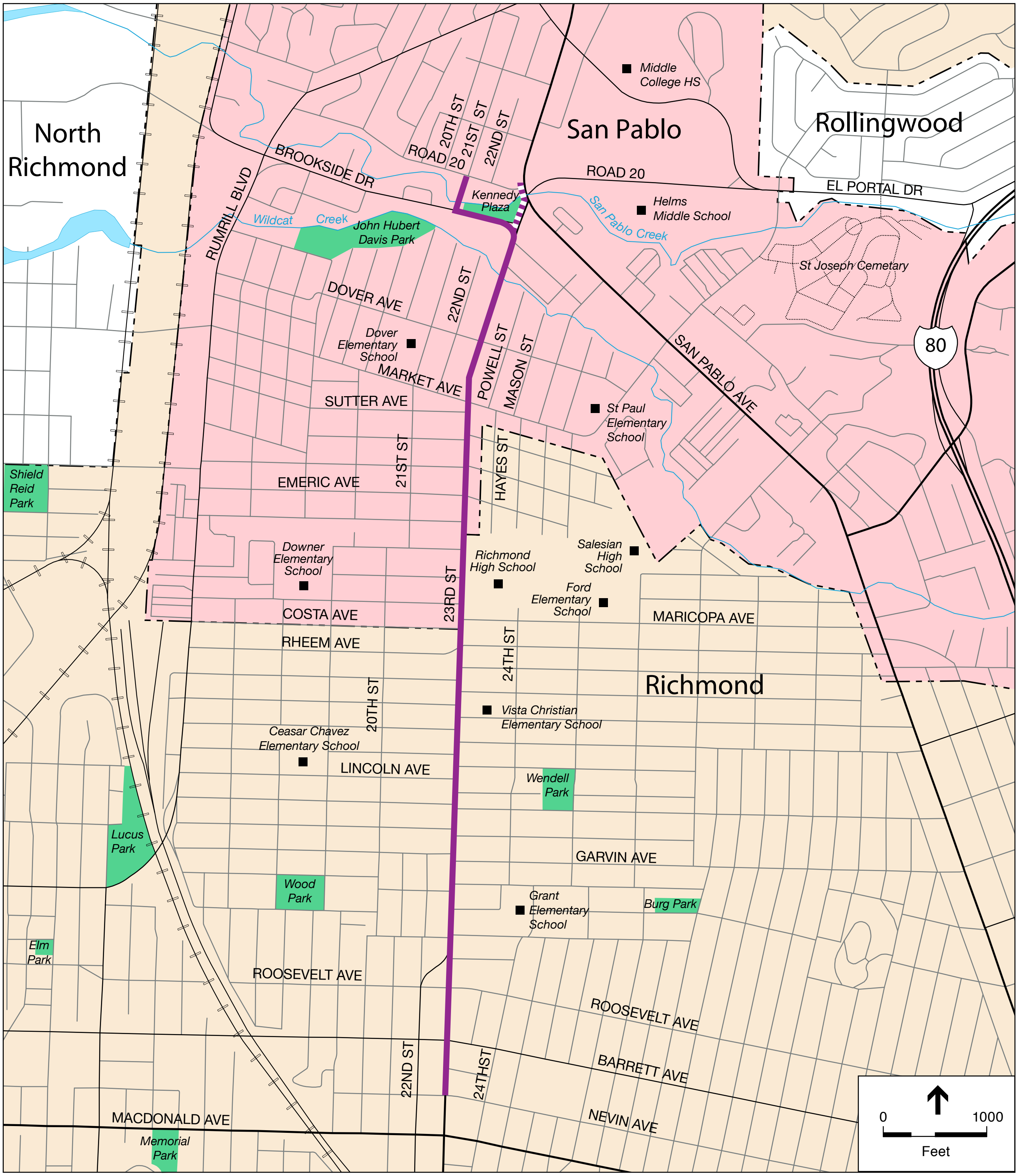
### San Pablo Avenue Option

An alternative crossing of San Pablo Creek is under consideration, and is evaluated at an equal level of detail in this EIR. This alternative consists of a pipe bridge spanning the creek adjacent to San Pablo Avenue within the park at Kennedy Plaza, which is owned and maintained by the City of San Pablo (APN 411-282-001). The Central Pressure Zone Pipeline (Richmond/San Pablo) would end underground near the intersection of Road 20 and San Pablo Avenue where it would connect to an existing 48-inch diameter transmission pipeline (Figure 2-9).

# 2.6 Project Design

## 2.6.1 Pipeline Diameter and Material

The Wildcat Pipeline (Berkeley) would be a 48-inch diameter pipeline, while the remaining pipelines would each have a diameter of 36-inches. All four pipelines would be constructed of mortar-lined and plastic- or mortar-coated welded steel pipeline.



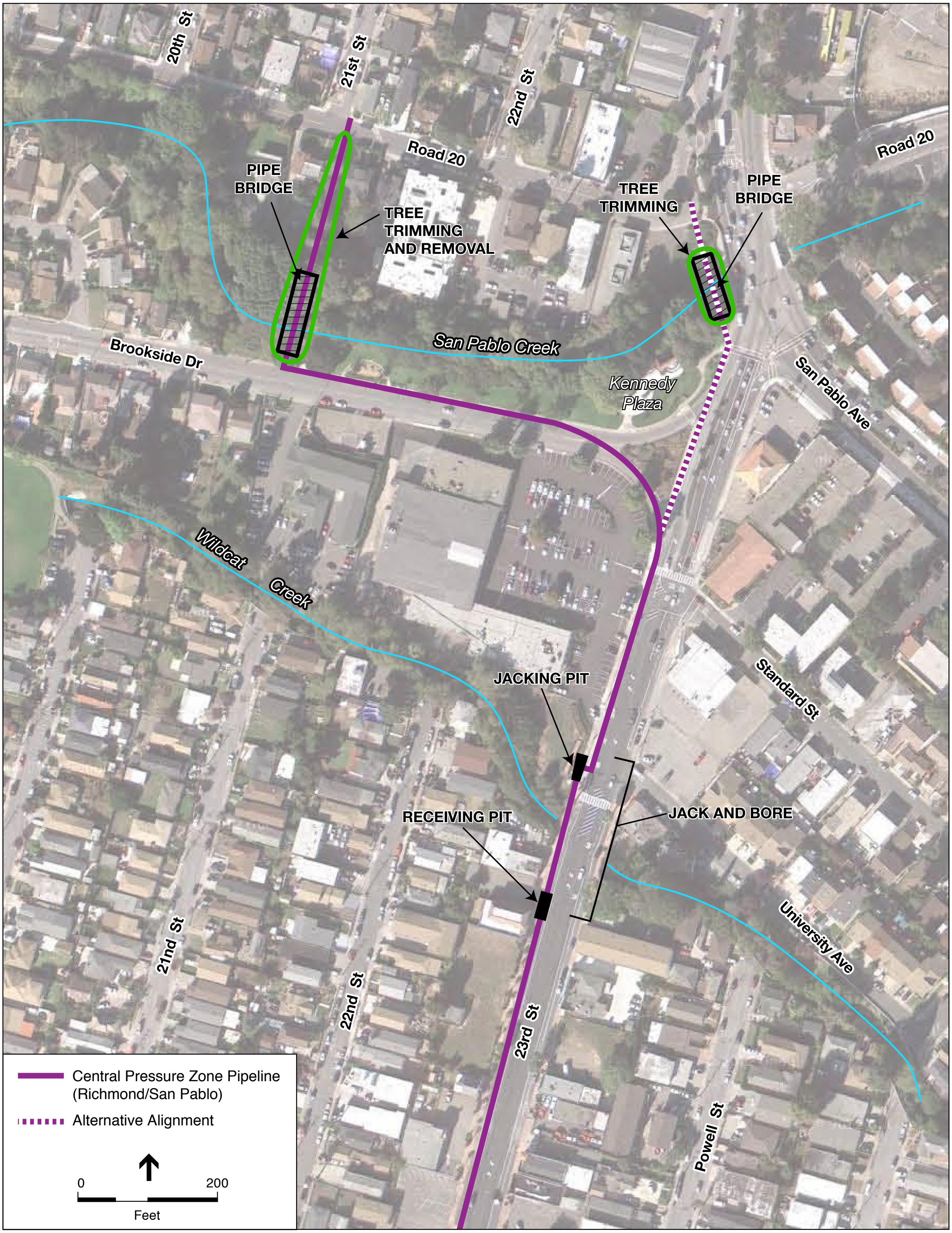

Central Pressure Zone Pipeline (Richmond/San Pablo)

Alternative Alignment

SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-8**
Central Pressure Zone Pipeline (Richmond/San Pablo)




SOURCE: ESA; Google Maps

EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-9**
Creek Crossings - Central Pressure Zone Pipeline (Richmond/San Pablo)

## 2.6.2 Appurtenances

**Figure 2-10**
Typical Air Valve

The pipelines would have air valves at high points and certain sharp grade breaks and blowoffs at low points. Air valves are required to have above-grade vents and protected by a cage. The above-grade vents would consist of an approximately 2-inch-diameter air valve and associated piping, anchored on an approximately 2.5-foot by 1.5-foot concrete pad, and enclosed by an approximately 2-foot-wide by 1-foot-tall stainless steel mesh cage (**Figure 2-10**). Test stations would be included as required.

Test stations are used to monitor the cathodic protection system, which controls corrosion of the buried pipelines. Wires attached to two pipeline segments (or attached to a segment of pipeline and a corrosion protection device called an anode) are brought to the surface to allow technicians to test the electrical current. Three types of test stations are used by EBMUD. By preference a conduit attached to a standard plastic marker post (4-in x 4-in x 6-ft high) is used in off road applications and a water meter box is used for side walk installations. If neither of these options is available, the test station is installed in the street under a valve pot cover.

Blow-offs or pumping tees are similar to fire hydrants without the hydrant body on top. Blow-offs are small pipeline connections to the bottom of the pipeline at low points in the alignment and allow EBMUD to pump the water out of the pipeline. Blow-offs are not surge or pressure protection devices that automatically dump water into creeks. Blow-offs are manually operated with a hose connected to the end to direct the flow of water to a proper disposal route or to a tanker truck. Blow-offs are installed below the ground surface with access provided by a manhole, meter box or valve pot cover within a sidewalk or street.

Inline valves would be installed every 1,000 to 4,000 feet to allow portions of the pipelines to be isolated from the water distribution system for maintenance or repair. Inline valves would also be placed at the connection points between the new pipelines and the existing water distribution system. A bypass valve would be installed at each inline valve location. Bypass valves are required because the water pressure on a closed 36-inch or 48-inch inline valve is too great to manually open when one side of the valve is depressurized. The bypass valve would be a smaller valve that can be manually opened and allows water to fill into the empty side of the pipe and equalize the water pressure on both sides of the inline valve. Both inline valves and bypass valves are buried with the pipeline. The only above ground feature is a metal lid, known as a valve pot, that is flush with the street pavement and covers the valve operating stem.

Where a pipeline is located outside of a street in a landscaped area, the location of the pipeline would be indicated with flat fiberglass marker posts approximately 4-feet high and 4-inches wide (**Figure 2-11**).

**Figure 2-11**
Typical Marker Post

# 2.7 Construction

## 2.7.1 Schedule, Duration, Work Hours, and Staging

### Schedule

The West of Hills Northern Pipelines Project would be bid and constructed as two separate projects:

1) The Wildcat Pipelines Improvements Project, anticipated to be constructed from mid-2015 to mid-2017.

2) The Central Pressure Zone Pipelines Project, anticipated to be constructed between 2021 and 2022. The timing of construction of the Central Pressure Zone Pipelines Project is based on projected increases in water demand expected to manifest in the West of Hills area by 2025.

### Work Hours

Typical construction hours would be between 8:00 a.m. and 7:00 p.m. on weekdays, except for pipeline tie-ins as noted below. Work could periodically occur at night at traffic intersections when required by encroachment permit conditions to minimize traffic impacts. If required, it is expected that nighttime intersection work would only occur at arterial streets such as San Pablo Avenue in El Cerrito and Richmond, and Ashby Avenue in Berkeley.

Connecting the ends of the new pipelines to the existing pipeline network would involve continuous operation of a hot-tapping machine for at least 5 to 7 hours to cut into the wall of the existing pipe. While it is expected that this connection could be accomplished within one day, construction would need to continue until the connection is complete to reduce the potential for service disruptions. As a result, it is assumed that the tie-ins would require one 24-hour construction period to accomplish each connection. Pipeline dewatering pumps may need to be operated continuously (24 hours per day, 7 days per week) for up to one month at some locations.

### Duration

The overall estimated construction duration for each pipeline project includes six months for mobilization and demobilization. Pipeline construction in front of schools, where tree removal would occur, and potentially at creek crossings would be scheduled to occur during certain times of the year as follows:

- Construction of pipeline segments directly in front of schools would be completed during traditional school breaks (i.e., summer break or winter holiday break).
- Tree removal would be scheduled to occur between September 1 and January 31 (i.e., outside bird nesting season) or after pre-construction nesting bird surveys confirm that tree removal would not impact nesting birds during the breeding season.
- Permits associated with construction activities at creek crossings could contain seasonal restrictions.

During construction of the two Wildcat and two Central Pressure Zone Pipelines Projects, it is anticipated that the two segments of each pipeline project may be constructed concurrently; for example, both the Wildcat Pipeline (Berkeley) and the Wildcat Pipeline (El Cerrito) would be under construction at the same time. It is possible that construction of pipeline segments with seasonal restrictions, as mentioned above (e.g., segments in front of schools), would also occur at the same time as construction on other portions of the pipeline; thus, as many as three portions could be under construction simultaneously.

The duration of pipeline construction at any one location would depend on the production rate, which is the number of feet per day of pipeline that a crew could install based on factors such as construction technique, work hours, width of the construction corridor, and site conditions (such as cross streets and traffic control requirements and the presence of other utilities). **Tables 2-2** through **2-5** contain estimates of the production rates and durations of pipeline construction for the various segments of each proposed pipeline. The open trench method of pipeline construction is described in more detail below.

### Staging

Construction staging for all of the alignments would generally be provided within roadways directly adjacent to the pipeline routes. While most excavated soil and other materials would be hauled off-site for disposal or storage on a daily basis, staging areas would provide short-term storage of heavy equipment, piping, and other materials, as well as parking for project construction workers.

## 2.7.2 Construction Activities

A majority of the pipelines would be installed in the ground using open-trench construction. Near the northern terminus of the Central Pressure Zone Pipeline (Richmond/San Pablo), the jack and bore method would be used for the crossing of Wildcat Creek and a pipe bridge would be used for the crossing of San Pablo Creek. These construction methods are described below. In 2006, the Contra Costa County City-County Engineering Advisory Committee and a coalition of utility agencies developed the Utility Trench Master Permit Conditions to provide a uniform approach to utility trench work within the public right of way for all jurisdictions within Contra Costa County. The Utility Trench Master Permit Conditions provide direction on agency coordination, work timing, and pavement repair. EBMUD would follow the conditions laid out in the Utility Trench Master Permit for trench work undertaken for this Project.

**TABLE 2-2**
**WILDCAT PIPELINE (BERKELEY) CONSTRUCTION DETAILS**

| Segment | Streets | From | To | Length (ft.) | Road Closures[1] | Construction Method | Estimated Production Rate (linear ft./day)[2] | Approximate Duration (weeks)[3] |
|---|---|---|---|---|---|---|---|---|
| 1 | Dana Street<br>Ward Street<br>Telegraph Avenue<br>Stuart Avenue | Parker Street & Dana Street | Hillegass Avenue & Stuart Street | 2,550 | Dana Street<br>Ward Street<br>Stuart Street | Open Trench | 80 - 200 | 3 - 6 |
| 2 | Hillegass Avenue | Hillegass Avenue & Stuart Street | Hillegass Avenue & Russell Street | 640 | Hillegass Avenue | Open Trench | 80 - 200 | 1 - 2 |
| 3 | Hillegass Avenue | Hillegass Avenue & Russell Street | Hillegass Avenue & Woolsey Street | 1,700 | Hillegass Avenue | Open Trench | 80 - 200 | 2 - 4 |
| 4 | Claremont Avenue<br>Woolsey Street | Hillegass Avenue & Woolsey Street | The Uplands & Claremont Avenue | 2,100 | Woolsey Street | Open Trench | 80 - 200 | 2 - 5 |
| 5 | Parkside Drive<br>The Uplands | The Uplands & Claremont Avenue | Parkside Drive & Nogales Street | 1,240 | Parkside Drive<br>The Uplands | Open Trench | 80 - 200 | 1 - 3 |
| Flushing, Pressure Testing, Chlorination | **Entire Pipeline** | | | 0 | N/A | N/A | N/A | 4 |
| Two Hot Tap Connections | Dana Street at Parker Street<br>Nogales Street at Parkside Drive | | | 0 | Dana St. at Parker St.; Parker St. at Dana St; Nogales St. at Parkside Dr.;<br>Parkside Dr. at Nogales St. | Hot Tap | N/A | 5<br>(2.5 weeks at each location) |
| Final Paving | All affected segments | | | 8,230 | Affected streets | Paving | 700 | 2 |
| **Total** | | | | **8,230** | | | | **20 - 32[4]** |

NOTES:

1 Only the portions of roads under construction would be closed. Remaining segments of the pipeline alignment would remain open.
2 The production rate is subject to variation due to site conditions (access, existing utilities, and traffic).
3 Durations do not include down-time, mobilization, and demobilization.
4 Total durations may not add up due to rounding. Construction periods may overlap thereby reducing overall duration.

**TABLE 2-2 (Continued)**
**WILDCAT PIPELINE (BERKELEY) BENVENUE AVENUE OPTION CONSTRUCTION DETAILS**

| Segment | Streets | From | To | Length (ft.) | Road Closures[1] | Construction Method | Estimated Production Rate (linear ft./day)[2] | Approximate Duration (weeks)[3] |
|---|---|---|---|---|---|---|---|---|
| 1 | Dana Street<br>Ward Street<br>Telegraph Avenue<br>Stuart Avenue | Parker Street & Dana Street | Hillegass Avenue & Stuart Street | 2,550 | Dana Street<br>Ward Street<br>Stuart Street | Open Trench | 80 - 200 | 3 - 6 |
| 2 | Stuart Street, Benvenue Avenue | Benvenue Avenue & Russell Street | Stuart Street & Hillegass Avenue | 920 | Benvenue Avenue | Open Trench | 80 - 200 | 1 - 2 |
| 3 | Benvenue Avenue | Benvenue Avenue & Russell Street | Benvenue Avenue & Woolsey Street | 1,690 | Benvenue Avenue | Open Trench | 80 - 200 | 2 - 4 |
| 4 | Claremont Avenue<br>Woolsey Street | Benvenue Avenue & Woolsey Street | The Uplands & Claremont Avenue | 1,800 | Woolsey Street | Open Trench | 80 - 200 | 2 - 5 |
| 5 | Parkside Drive<br>The Uplands | The Uplands & Claremont Avenue | Parkside Drive & Nogales Street | 1,240 | Parkside Drive<br>The Uplands | Open Trench | 80 - 200 | 1 - 3 |
| Flushing, Pressure Testing, Chlorination | Entire Pipeline | | | 0 | N/A | N/A | N/A | 4 |
| Two Hot Tap Connections | Dana Street at Parker Street<br>Nogales Street at Parkside Drive | | | 0 | Dana St. at Parker St.; Parker St. at Dana St; Nogales St. at Parkside Dr.;<br>Parkside Dr. at Nogales St. | Hot Tap | N/A | 5<br>(2.5 weeks at each location) |
| Final Paving | All affected segments | | | 8,200 | Affected streets | Paving | 700 | 3 |
| **Total** | | | | **8,200** | | | | **20 - 32**[4] |

NOTES:
1 Only the portions of roads under construction would be closed. Remaining segments of the pipeline alignment would remain open.
2 The production rate is subject to variation due to site conditions (access, existing utilities, and traffic).
3 Durations do not include down-time, mobilization, and demobilization.
4 Total durations may not add up due to rounding. Construction periods may overlap thereby reducing overall duration.

**TABLE 2-3**
**WILDCAT PIPELINE (EL CERRITO) CONSTRUCTION DETAILS**

| Segment | Street | From | To | Length (ft.) | Road Closures[1] | Construction Method | Estimated Production Rate (linear ft./day) | Approximate Duration (weeks)[2] |
|---|---|---|---|---|---|---|---|---|
| 1 | Hill Street<br>Elm Street<br>Richmond Street | Hill Street & Liberty Street | Richmond Street & Schmidt Lane | 4,500 | Entire Alignment except Key Route Blvd. Between Lynn Avenue and C Street | Open Trench | 80 - 200 | 5 - 11 |
| 2 | Richmond Street | Schmidt Lane | Lincoln Avenue | 4,220 | | | | 4 - 10 |
| 3 | Lincoln Avenue<br>Norvell Street<br>Fairmount Avenue<br>Behrens Street<br>C Street<br>Ashbury Avenue<br>Lynn Avenue | Richmond Street & Lincoln Avenue | Lynn Avenue & San Carlos Avenue | 4,830 | | | | 5 - 12 |
| Flushing, Pressure Testing, Chlorination | Entire Pipeline | | | 0 | N/A | N/A | N/A | 4 |
| Two Hot Tap Connections | San Carlos Avenue at Lynn Avenue<br>Liberty Street at Hill Street | | | 0 | Lynn Ave. at San Carlos Ave.; San Carlos Ave. at Lynne Ave.; Hill St. at Liberty St.; Liberty St. at Hill St. | Hot Tap | N/A | 5<br>(2.5 weeks at each location) |
| Final Paving | All affected segments | | | 13,550 | Affected streets | Paving | 700 | 4 |
| **Total** | | | | **13,550** | | | | **25 - 47**[3] |

NOTES:
1 Only the portions of roads under construction would be closed. Remaining segments of the pipeline alignment would remain open.
2 Durations do not include down-time, mobilization, and demobilization.
3 Total durations may not add up due to rounding. Construction periods may overlap thereby reducing overall duration.

**TABLE 2-4**
**CENTRAL PRESSURE ZONE PIPELINE (EL CERRITO/RICHMOND) CONSTRUCTION DETAILS**

| Segment | Street | From | To | Length (ft.) | Lane/ Road Closures[1] | Construction Method | Estimated Production Rate (linear ft./day) | Approximate Duration (weeks)[2] |
|---|---|---|---|---|---|---|---|---|
| 1 | San Pablo Avenue | Nevin Avenue | Hill Street | 4,130 | 2 Travel Lanes & 1 Parking Lane Closed | Open Trench | 80 - 200 | 4 - 10 |
| 2 | San Pablo Avenue | Hill Street | Potrero Avenue | 1,200 | | | | 1 - 3 |
| 3 | San Pablo Avenue | Potrero Avenue | Schmidt Lane | 2,620 | | | | 3 - 7 |
| 4 | San Pablo Avenue | Schmidt Lane | Central Avenue | 4,970 | | | | 5 - 12 |
| Flushing, Pressure Testing, Chlorination | Entire Pipeline | | | 0 | N/A | N/A | N/A | 4 |
| Two Hot Tap Connections | San Pablo Avenue at Nevin Avenue<br>San Pablo Avenue at Central Avenue | | | 0 | 2 Travel Lanes & 1 Parking Lane Closed | Hot Tap | N/A | 5 (2.5 weeks at each location) |
| Final Paving | All affected segments | | | 12,920 | Affected streets | Paving | 350[3] | 7 |
| **Total** | | | | **12,920** | | | | **30 - 49**[4] |

NOTES:

1 Only the portions of lanes and roads under construction would be closed. Remaining segments of the pipeline alignment would remain open.
2 Durations do not include down-time, mobilization, and demobilization.
3 10 to 14-inch AC paving is assumed for San Pablo Avenue (compared to 6-inch AC along the other alignments) therefore a slower paving rate of 350 ft/day is assumed for the Central Pressure Zone Pipelines (El Cerrito/Richmond).
4 Total durations may not add up due to rounding. Construction periods may overlap thereby reducing overall duration.

**TABLE 2-5**
**CENTRAL PRESSURE ZONE PIPELINE (RICHMOND/SAN PABLO) CONSTRUCTION DETAILS**

| Segment | Street / Phase | From | To | Length (ft.) | Lane/Road Closures[1] | Construction Method | Estimated Production Rate (linear ft./day) | Approximate Duration (weeks)[2] |
|---|---|---|---|---|---|---|---|---|
| 1 (San Pablo Creek Crossing) | Abutment Construction | | | N/A | None | Pipe Bridge | N/A | 2 |
| | Bridge Delivery/ Erection | | | N/A | | | N/A | 2 days |
| | Pipeline Installation | | | 95 | | | 50 | 2 days |
| 2 (Wildcat Creek Crossing) | Pits Excavation | | | N/A | None | Jack and Bore | N/A | 2 |
| | Casing Installation | | | 170 | | | 10 | 3 |
| | Pipeline Installation | | | 170 | | | 50 | 1 |
| | Pits Backfill | | | N/A | | | N/A | 4 |
| 3 and 4 | EBMUD ROW X574 Road 20 | Road 20 | Brookside Drive | 975 | Road 20 Brookside Drive | Open Trench | 80 - 200 | 1 - 2 |
| 5 and 6 | 23rd Street | Brookside Drive | Nevin Avenue | 8,910 | 2 Travel Lanes & 1 Parking Lane Closed | Open Trench | 80 - 200 | 9 - 22 |
| Flushing, Pressure Testing, Chlorination | Entire Pipeline | | | 0 | N/A | N/A | N/A | 4 |
| Two Hot Tap Connections | Road 20 at 21st Street<br>23rd Street at Nevin Avenue | | | 0 | Road 20 at 21st St.; 21st St at Road 20; 23rd St. at Nevin Ave. (2 Travel Lanes & 1 Parking Lane Closed) | Hot Tap | N/A | 5 (2.5 weeks at each location) |
| Final Paving[3] | All affected segments | | | 9,580 | Affected streets | Paving | 700 | 3 |
| **Total** | | | | **9,845** | | | | **36 - 51[4]** |

NOTES:

1 Only the portions of roads under construction would be closed. Remaining segments of the pipeline alignment would remain open.
2 Durations do not include down-time, mobilization, and demobilization.
3 Length of paving excludes creek crossings where existing pavement would not be affected.
4 Total durations may not add up due to rounding. Construction periods may overlap thereby reducing overall duration.

**TABLE 2-5 (Continued)**
**CENTRAL PRESSURE ZONE PIPELINE (RICHMOND/SAN PABLO) SAN PABLO AVENUE OPTION CONSTRUCTION DETAILS**

| Segment | Street / Phase | From | To | Length (ft.) | Lane/Road Closures[1] | Construction Method | Estimated Production Rate (linear ft./day) | Approximate Duration (weeks)[2] |
|---|---|---|---|---|---|---|---|---|
| 1 (San Pablo Creek Crossing) | Abutment Construction | | | N/A | None | Pipe Bridge | N/A | 2 |
| | Bridge Delivery/ Erection | | | N/A | | | N/A | 2 days |
| | Pipeline Installation | | | 100 | | | 50 | 2 days |
| 2 (Wildcat Creek Crossing) | Pits Excavation | | | N/A | None | Jack and Bore | N/A | 2 |
| | Casing Installation | | | 170 | | | 10 | 3 |
| | Pipeline Installation | | | 170 | | | 50 | 1 |
| | Pits Backfill | | | N/A | | | N/A | 4 |
| 3 and 4 | 23rd Street, San Pablo Avenue, Parcels 411-282-001 & 412-300-010 | Road 20 | Brookside Drive | 475 | | Open Trench | 80 - 200 | 1 |
| 5 and 6 | 23rd Street | Brookside Drive | Nevin Avenue | 8,910 | 2 Travel Lanes & 1 Parking Lane Closed | Open Trench | 80 - 200 | 9 - 22 |
| Flushing, Pressure Testing, Chlorination | Entire Pipeline | | | 0 | N/A | N/A | N/A | 4 |
| Two Hot Tap Connections | Road 20 adjacent to San Pablo Avenue<br>23rd Street at Nevin Avenue | | | 0 | Road 20 adjacent to San Pablo Avenue (1 travel lane)<br>23rd St. at Nevin Ave. (2 Travel Lanes & 1 Parking Lane Closed) | Hot Tap | N/A | 5 (2.5 weeks at each location) |
| Final Paving[3] | All affected segments | | | 9,385 | Affected streets | Paving | 700 | 3 |
| **Total** | | | | **9,655** | | | | **36 - 50** |

NOTES:
1 Only the portions of roads under construction would be closed. Remaining segments of the pipeline alignment would remain open.
2 Durations do not include down-time, mobilization, and demobilization.
3 Length of paving excludes creek crossings where existing pavement would not be affected.
4 Total durations may not add up due to rounding. Construction periods may overlap thereby reducing overall duration.

**Table 2-6** presents the construction characteristics for the Project.

**TABLE 2-6**
**PIPELINE CONSTRUCTION CHARACTERISTICS**

| Design Specification | Description |
|---|---|
| Minimum Construction Easement Width | 25 feet for 36-inch diameter pipe<br>30 feet for 48-inch diameter pipe |
| Minimum Cover over Top of Pipe | 42 inches |
| Minimum Trench Width | 56 inches for 36-inch diameter pipe<br>68 inches for 48-inch diameter pipe |
| Pavement Restoration | In accordance with the Utility Master Permit Conditions, the structural section would match the existing structural section and would extend 12 inches beyond each edge of trench or to curb line if the edge of trench is within 2 feet of the curb. |

SOURCE: EBMUD 2012

## Open Trench Method

The main pipeline construction technique that would be used for both the Wildcat Aqueduct and Central Pressure Zone Pipeline Projects would be open trench (also known as “cut and cover”) technique. **Figure 2-12** provides a schematic representation of how open trench construction would progress along the alignments. Open trench construction involves:

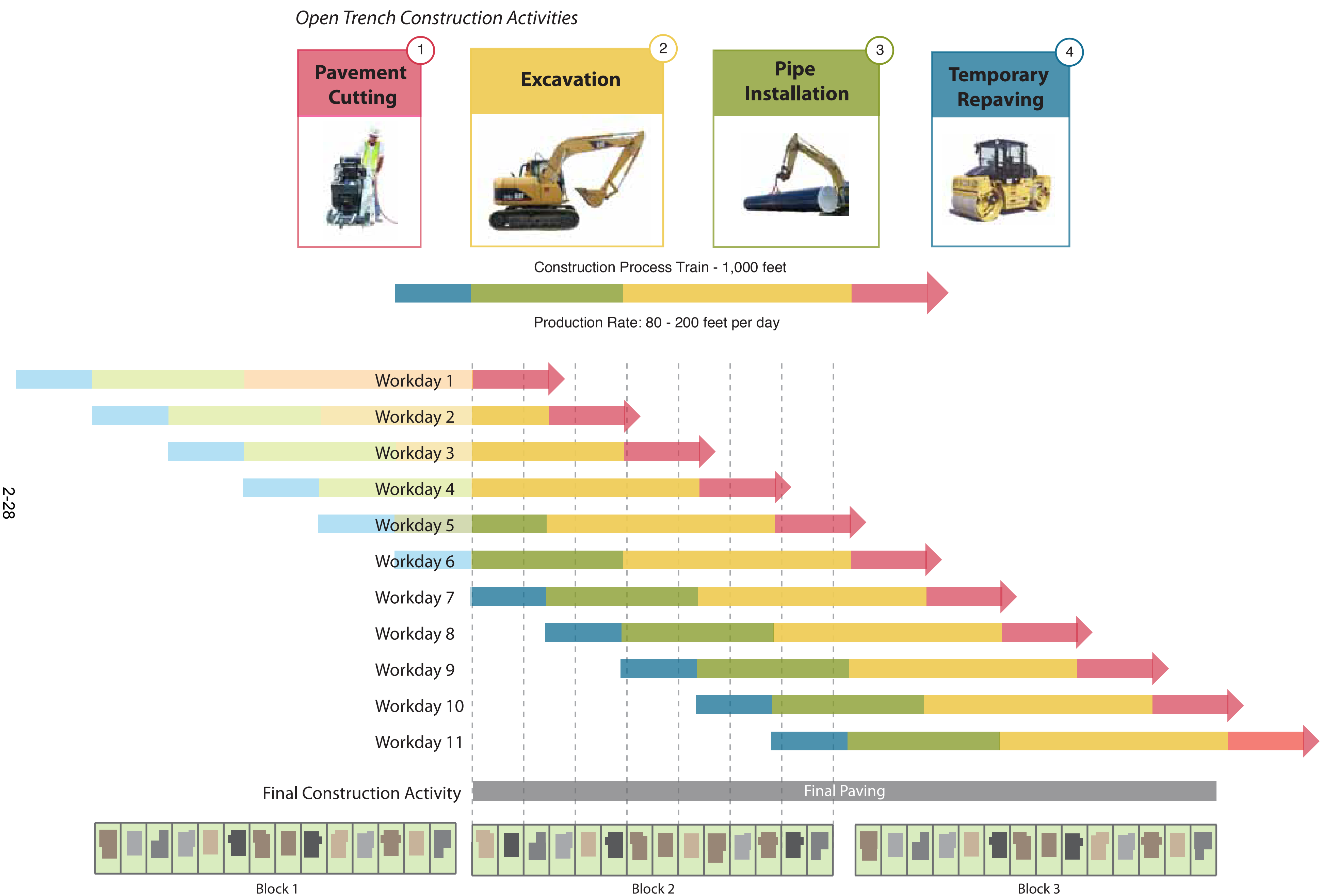
- Utility locating/potholing
- Sawcutting the pavement
- Excavating a trench
- Removing and stockpiling the soils
- Installing the pipeline
- Backfilling the trench
- Repaving

### *Construction Corridor*

A minimum construction corridor width of 25 to 30 feet (depending on pipe diameter) would be needed to accommodate pipe storage and to allow trucks and equipment access along the trench. In some areas where the pipeline would need to be installed at greater depth to avoid other utilities, a wider trench and construction easement of up to 40 feet would be required. Other construction activities, such as the installation of pipeline connections, could also require larger excavations.

### *Construction in Streets, Open Space*

Open trench construction in public roadways would require closure of at least one travel lane, depending on roadway width and size of the pipeline and trench, full closure will be required in some reaches. Most spoils would be hauled off-site, and some new materials would be imported for backfilling. Where the existing soil characteristics are acceptable, some trench spoils would be used to backfill around the pipe instead of being hauled off-site and new material imported. The trench spoils may be mixed with cement to improve its soil characteristics for backfilling the pipe.




SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-12**
Typical Progression of Open Trench Construction

### *Construction Details*

Refer to the tables in **Appendix C** for the following information for each of the four pipelines:

- Pipe length and diameter by street
- Construction production rate (feet per day, unpaved and paved areas) and duration by street
- Daily excavation and fill quantities
- Worker and truck vehicle trips per day

### *Equipment*

Typical construction equipment associated with installation of the pipelines would include: pavement saws, jack hammers, excavators, backhoes, dump trucks, front-end loaders, forklifts, flatbed delivery trucks, mobile concrete batch plants, soil-cement mixing machines, paving equipment (asphalt and/or concrete trucks, rollers), water trucks, and vibratory compactors. Staging areas would be located adjacent to or in the vicinity of the pipeline corridors.

## Jack and Bore Method

The jack and bore method would be used to install approximately 170 linear feet of pipeline near the northern terminus of the Central Pressure Zone Pipeline (Richmond/San Pablo) for the crossing of Wildcat Creek. This method (illustrated in **Figure 2-13**) requires:

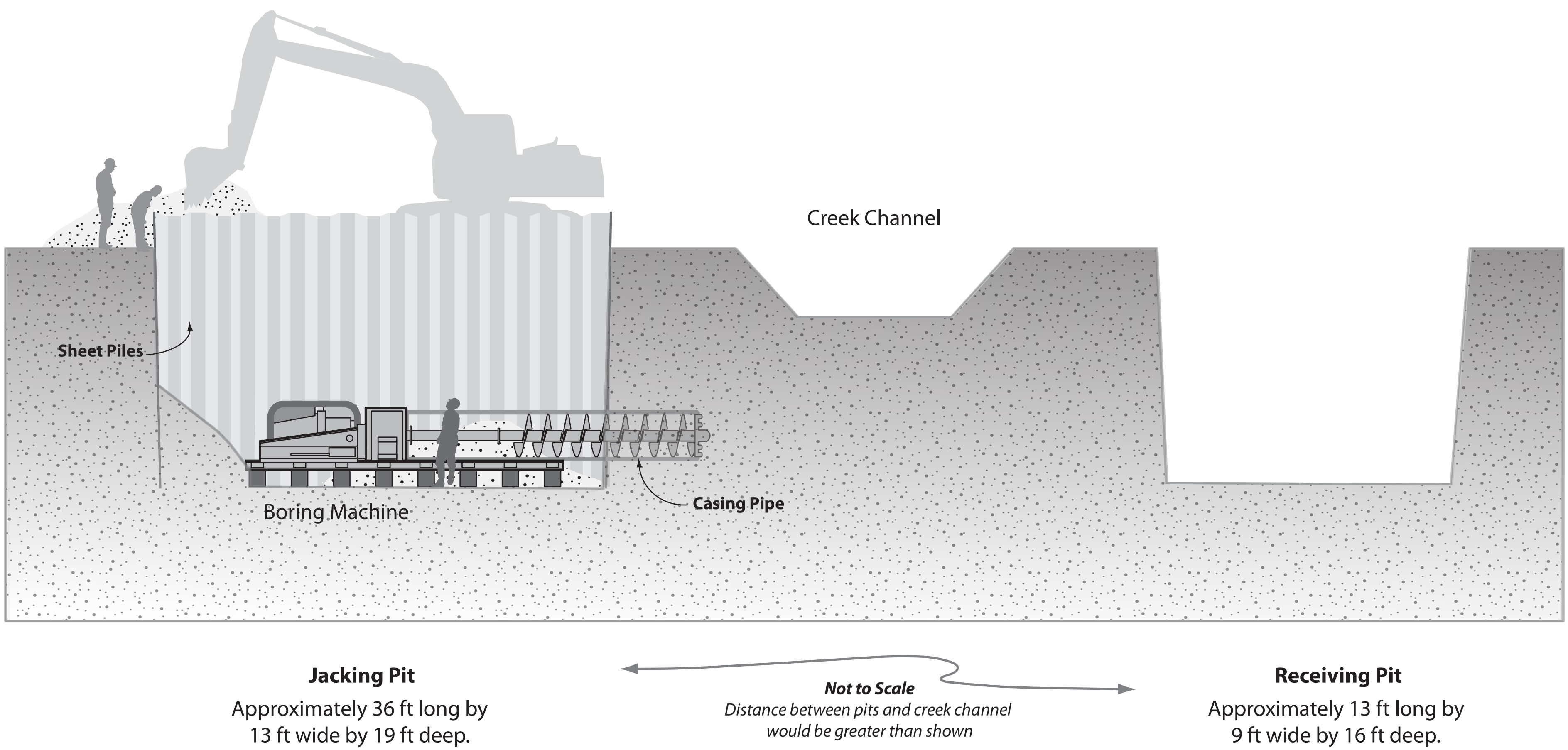
- Excavating a temporary jacking and receiving pit
- Constructing a temporary jacking platform in the jacking pit
- Drilling or jacking a casing pipe through the earth under the creek
- Installing the new pipeline in the casing pipe
- Connecting the new pipeline-to-pipeline segments on either end of the crossing
- Backfilling the jacking and receiving pit

### *Construction Corridor*

This process would require the excavation of an approximately 36-foot-long by 13-foot-wide by 19-foot-deep jacking pit and an approximately 13-foot-long by 9-foot-wide by 16-foot-deep receiving pit. Vibratory or impact driven sheet piles would be used to ensure the stability of the pit walls. Soil removed from the pits would either be stockpiled and reused, or loaded directly into dump trucks and hauled away for disposal. If existing soil is not adequate for backfilling, new backfill material would be imported.

### *Construction Details*

The jacking pit would be located north of Wildcat Creek directly adjacent to 23rd Street on a parcel of land owned by the city of San Pablo (APN 411-281-015), which is currently being developed into a park. The receiving pit would be located on the south side of Wildcat Creek within the west side parking lane of 23rd Street between 2013 and 2001 23rd Street.




SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488
**Figure 2-13**
Typical Jack & Bore Construction

The jacking pit would be located north of Wildcat Creek directly adjacent to 23rd Street within a portion of a park owned by the city of San Pablo (APN 411-281-015). The receiving pit would be located on the south side of Wildcat Creek within the west side parking lane of 23rd Street between 2013 and 2001 23rd Street. Soil removed from the pits would either be stockpiled and reused, or loaded directly into dump trucks and hauled away for disposal. If existing soil is not adequate for backfilling, new backfill material would be imported.

#### Equipment

Typical construction equipment associated with the jack and bore method would include: horizontal boring machine or auger, hydraulic jack, excavators, backhoes, dump trucks, front-end loaders, forklifts, flatbed delivery trucks, paving equipment (asphalt and/or concrete trucks, rollers), water trucks, and vibratory compactors. Staging areas would be located adjacent to or in the vicinity of the jacking and receiving pits.

### *Alternative Wildcat Creek Crossing*

The city of San Pablo is in the preliminary process of assessing the existing culvert crossing of Wildcat Creek on 23rd Street to address flood control issues. If the city of San Pablo replaces the existing culvert crossing of Wildcat Creek on 23rd Street, it may be possible to construct the pipeline within a new roadway bridge.

## Pipe Bridge Method

The Central Pressure Zone Pipeline (Richmond/San Pablo) would cross San Pablo Creek by pipe bridge at one of two alignments – the proposed alignment utilizes an existing EBMUD utility corridor between Brookside Drive and Road 20 in San Pablo, while the San Pablo Avenue option would be developed in the park at Kennedy Plaza owned by the city of San Pablo. A similar design would be used at either location.

If the pipe bridge is constructed within the EBMUD utility corridor, the pipe bridge would be at elevation of about 48 feet[1] at the bridge footings, 51 feet at the bridge deck and 55 feet at the top rail of the bridge. Under the San Pablo Avenue Option, the pipe bridge would be at approximately 50 feet at the bridge footings, 53 feet at the bridge deck and 57 feet at the top rail. In comparison, the elevation of the current San Pablo Avenue bridge is approximately 52 feet at the bridge deck and 45 feet at the bottom of the bridge.

The bridge footings would be located above the ordinary high water mark and the 100-year floodplain of the creek and the footings would be appropriately anchored. Wetlands would be avoided to the extent practical. The bridge would be constructed of steel and concrete, with the pipe installed on a supportive platform spanning the creek. The ends of the pipe bridge would be fenced to prevent access to the pipe bridge. An example of typical pipe bridge construction is shown in **Figure 2-14**.

1 All elevations presented in North American Vertical Datum of 1988.

**Figure 2-14**
Typical Pipe Bridge Construction

If the San Pablo Avenue option is selected, the bridge may be developed as a combined pipe and pedestrian bridge to replace the existing pedestrian walkway of the San Pablo Avenue Bridge. Under this scenario, the pipeline could be constructed under a pedestrian walkway. If EBMUD selects the San Pablo Avenue option to construct a pipe bridge crossing of San Pablo, EBMUD would work with the City of San Pablo to determine the feasibility of a combined pipe and pedestrian bridge.

### *Equipment*

Typical construction equipment associated with the pipe bridge method would include: excavators, backhoes, dump trucks, front-end loaders, forklifts, flatbed delivery trucks, crane, and vibratory compactors. Staging areas would be located adjacent to or in the vicinity of the pipeline corridors wherever feasible.

## Hot Tap Connections

The ends of the proposed pipelines would be connected to existing pipelines by hot tap connection. Hot tapping (also referred to as pressure tapping), is a method of making a connection to an existing pipeline without interrupting service. A saddle and pressure valve is first fitted and grouted to the outside of the pipeline. A hot tap machine is then fitted to the open valve. The hot tap machine contains a hole saw that is used to cut an opening in the pipeline while pressure is maintained by the hot tap machine. Once the hole is made, the valve is closed and the hot tap machine is removed and the new pipeline is fitted to the valve.

The pipeline tie-ins would require the excavation of a trench or pit at each location. Temporary shoring would be required to ensure the stability of the excavation. Shoring may include the use of vibratory or impact driven sheet piles. The proposed tie-ins would be located within street right-of-ways and sited to minimize disruptions to traffic and homeowner access.

## Spoils Handling and Disposal

Construction of the pipeline would require the excavation of the pipeline trench and jack and bore pits. Excavated material (spoils) would be stored temporarily on site or hauled off-site by truck for storage or disposal. Construction of the pipelines is estimated generate the following amounts of excavated materials:

**TABLE 2-7**
**ESTIMATED SPOIL VOLUME**

| Pipeline | Spoils (cubic yards) |
|---|---|
| Wildcat Pipeline (Berkeley) | 15,500 |
| Wildcat Pipeline (El Cerrito) | 18,000 |
| Central Pressure Zone Pipeline (El Cerrito/Richmond) | 17,000 |
| Central Pressure Zone Pipeline (Richmond/San Pablo) | 13,500 |
| **Total** | **64,000** |

Some of the excavated material will be used for backfill, however, due to the displacement caused by the new pipelines, and the need to use fill that meets EBMUD construction specifications, some of the excavated material would be excess. All solid waste generated in the form of construction debris (broken pavement, spoils) that cannot be reused as fill would be disposed of at appropriate receiving locations identified by the contractor in response to standard EBMUD construction specification regarding material off-haul and disposal. The Project would dispose of all demolition debris in accordance with all applicable state and local rules and regulations.

## Dewatering

Dewatering may be required at two steps of the pipeline construction process:

1. During excavation of pipeline trenches and pits, any groundwater or stormwater that accumulates within the excavated areas would need to be pumped out and disposed. Likewise, water used for dust control, wash water, and other construction water would require containment, handling, and disposal.

2. Once the pipeline construction is complete, the new pipes would be dosed with chlorine and flushed. This flush water would be de-chlorinated prior to disposal.

All water discharged would be managed and discharged in storm drains or sewer lines, in compliance with the permit conditions of the respective cities (or Stege Sanitary District for

El Cerrito). The contractor would be required to comply with Section 01 35 44 Environmental Requirements of EBMUD’s contract specifications that require the contractor to prepare a Water Control and Disposal Plan to ensure compliance with all regulations of the California Regional Water Quality Control Board, California Department of Fish and Wildlife, County Flood Control Districts, and any other regulatory agency having jurisdiction.

### 2.7.3 Tree Removal and Right of Way Maintenance

Tree removal would be required to accommodate pipeline construction at two locations. For the Wildcat Pipeline (Berkeley), a short segment of pipeline would be constructed within the open space between The Uplands and Parkside Drive. The pipeline would be located to minimize impacts to trees; however, construction here would require the removal of approximately two trees and the trimming of the limbs and roots of additional trees located within the public right of way. Mature trees and native oaks would be avoided to the extent practical.

At San Pablo Creek, the proposed alignment of the Central Pressure Zone Pipeline (Richmond/San Pablo) utilizes an existing EBMUD utility corridor consisting of two EBMUD-owned properties located between Brookside Drive and Road 20 in San Pablo. This utility corridor has an existing 24 inch transmission pipeline, which is installed under San Pablo Creek. The proposed Project includes tree removal within these properties regardless of whether the pipeline is developed here or if it is developed near San Pablo Avenue under the San Pablo Avenue Option in order to properly access and maintain the existing transmission pipeline. While trees would only be removed within EBMUD-owned properties, construction and maintenance of the utility corridor may require the trimming of trees that are located on adjacent properties but have limbs and roots within the EBMUD-owned properties. Impacts to adjacent trees would be avoided to the extent practical.

## 2.8 Traffic Control Plan

The objective for developing traffic control plans for the proposed Project is to minimize traffic impacts by considering the following strategies: 1) maintaining traffic flow along the construction route where the roadway has adequate width; 2) selecting detour routes with comparable street classification; 3) being sensitive to fire department and emergency access concerns; 4) encouraging the use of arterial and collector streets for directed detours to minimize traffic impact to the local communities; and 5) developing a strategy of balancing construction time of day and overall Project duration with the local community to minimize the disruption caused by construction.

Complete road closure is proposed for pipeline construction along narrow two-lane roadways to provide adequate room for construction activities, enhance public safety and to expedite the construction operation. During construction, affected roadway segments would be closed to through traffic except for emergency vehicles, garbage collection service, and U.S. Postal Service. Local residents would generally be provided controlled access to and from their homes. Only roadway segments under construction would be closed. Once construction of a segment is completed, access to that segment would be restored. Outside of work hours, open trenches would be plated and road blocks would be removed to allow access during non-working periods. After hours, some construction equipment may be left within the work area.

Where local parking would be displaced, the contractor would obtain permission from the local agencies to temporarily prohibit parking. Where prohibiting parking would pose a hardship, such as locations where off-street or nearby parking permits restrict parking, the local agency would be asked to grant temporary area parking passes to residents to allow them to park at other locations not proximate to the construction. These alternate area parking pass measures are particularly applicable to the Wildcat Pipeline (Berkeley).

## 2.8.1 Traffic Control Schemes

Conceptual traffic control plans were prepared for the Project to identify the detour routing as well as the overall traffic handling and signing concept. The traffic control plans presented below outline the intended approach to minimize traffic disruption during the construction process. The specific location of the proposed pipeline segments within the identified roadway corridors has not yet been determined. Upon certification of the environmental impact report, detailed engineering will determine the specific location of the pipeline segments based on the location of existing utilities and other constraints. The conceptual traffic control plans presented here would then be further detailed prior to Project implementation. The final traffic control plans will address the specific locations of the proposed pipeline segments within the roadways, and identify the specific placement of traffic control devices including signage, barriers, and flaggers. Final traffic control plans will be developed in consultation with the appropriate jurisdictions.

All temporary traffic control measures indicated are in accordance with the California 2012 *Manual on Uniform Traffic Control Devices* (CA-MUTCD), which is referenced below for the implementation of specific traffic handling measures (Caltrans, 2012). Since construction is anticipated to occur in 2016 and later, the most recent edition of the CA-MUTCD would be applied at the actual time of construction. Site specific traffic control schemes have been developed for tie-in locations and for locations along the routes that require specialized handling; these traffic control schemes are presented in figures provided in **Appendix D** and are indicated by “TC” in the figure title (e.g. Figure TC-1**)**. The traffic control schemes presented below also reference typical applications from the CA-MUTCD. The applicable traffic control applications are provided in **Appendix E**.

### Wildcat Pipeline (Berkeley)

Most of the Wildcat Pipeline (Berkeley) is located along residential streets in the city of Berkeley. Because the residential streets are narrow (i.e. between 28 feet and 36 feet wide) and the pipeline construction requires approximately 25 to 30 feet of the street width, these streets would be closed during construction hours on a block-by-block basis. The widths available are insufficient to allow traffic to progress through the work zone safely. As a result, through traffic would be detoured around closed segments. Two arterials would also be affected; Telegraph Avenue and Claremont Avenue. These two arterials would remain open during construction and through traffic would be accommodated around the work zone. An alternative to this pipeline segment includes the option of routing along Benvenue Avenue instead of Hillegass Avenue.

**Figure TC-1** shows the proposed detour routes for the Wildcat Pipeline (Berkeley) construction. **Figure TC-2** shows the traffic control plan for construction of the Wildcat Pipeline (Berkeley) on Telegraph Avenue. Note that the traffic control scheme shown on Figure TC-2 for Telegraph Avenue is applicable to pipeline construction on Claremont Avenue as well because the two roadways have similar characteristics. However, it should be noted that pipeline construction for Claremont Avenue is assumed to occur in the northbound travel lane instead of the southbound travel lane as shown for Telegraph Avenue. **Figures TC-3** and **TC-4** show the traffic control plans for the tie-in of the Wildcat Pipeline (Berkeley) at the intersections of Parker Street and Dana Street, and Parkside Drive and Nogales Street, respectively. **Table 2-8** describes the traffic control schemes that would be used for specific intersections and roadways along the proposed route and the optional Benvenue Route. In addition to the specific traffic control plans presented in Figures TC-2 through TC-4.

Table 2-8 references typical traffic control applications identified in the CA-MUTCD that would be employed for designated segments and intersections (**Appendix E**).

## Wildcat Pipeline (El Cerrito)

The Wildcat Pipeline (El Cerrito) is located on residential streets in the city of El Cerrito. Because most of the residential streets are narrow (i.e. between 26 feet and 36 feet wide) and the pipeline construction requires approximately 25 to 30 feet of the width of the street, most of the streets would be closed during construction hours on a block-by-block basis. The widths available are insufficient to allow traffic to progress through the work zone safely. As a result, through traffic would be detoured around closed segments. One larger residential arterial, Ashbury Avenue, would also be affected. This road would remain open to southbound traffic during construction, and northbound traffic would be detoured around closed segments.

**Figure TC-5** shows the proposed detour routes for the Wildcat Pipeline (El Cerrito) construction. The traffic control plans for the tie-ins at the intersection of Hill Street and Liberty Street and Lynn Avenue and San Carlos Avenue are shown in **Figures TC-6** and **TC-7**, respectively. **Table 2-9** presents the applicable traffic control schemes for this route, including CA-MUTCD typical applications.

## Central Pressure Zone Pipeline (El Cerrito/Richmond)

In the Central Pressure Zone Pipeline (El Cerrito/Richmond) project area, San Pablo Avenue is a four-lane, north-south roadway with two travel lanes in each direction and a central median with turning lanes. San Pablo Avenue carries regional and local traffic; land uses along the roadway are primarily commercial. Based on a review of planned transportation improvements, no changes to the existing roadway network are expected to occur in the study area.

**TABLE 2-8**
**TRAFFIC CONTROL SCHEMES FOR THE WILDCAT PIPELINE (BERKELEY)**

| Segment Limits or Intersection | Segment or Intersection Characteristics | Traffic Control Plan Figure or CA-MUTCD Typical Application (TA)[a] (see Appendices D and E) | Traffic Handling Detail | Detour Routes (see Figure TC-1) | Pedestrian | Transit | Cyclist |
|---|---|---|---|---|---|---|---|
| **Tie-in @ Dana Street/Parker Street** | • 4-way stop | Figure TC-3 | • Partial intersection closure | Blake Street, Ellsworth Street, Carleton Street, Telegraph Ave., Chilton Way, Derby Street | Sidewalk would remain open on one side of each street | No transit route at intersection | Detoured to identified routes |
| **Dana Street** (Parker Street to Ward Street) | • 2-lane residential (w/ medical offices)<br>• 36 feet wide<br>• Parking both sides<br>• 770 VPD | Segment: TA-20<br>Intersections (Carleton St. & Derby St.): TA-26/TA-27 | • Block-long closure of traffic and parking lanes<br>• Staged construction across intersections with directed access facilitated by flaggers | Parker Street, Telegraph Ave., Ward Street | Sidewalk would remain open on one side of street | No transit route on segment | Detoured to identified routes |
| **Ward Street** (Dana Street to Telegraph Ave.) | • 2-lane residential<br>• 36 feet wide<br>• Parking both sides<br>• 1,100 VPD | TA-20 | • Block-long closure of traffic and parking lanes | EB: Dana Street<br>WB: Telegraph Ave. and Stuart Street | Sidewalk would remain open on one side of street | No transit route on segment | Detoured to identified routes |
| **Telegraph Ave.** (Ward Street to Stuart Street) | • 4-lane arterial<br>• 67 feet wide<br>• Parking both sides<br>• 18,000 VPD<br>• Class II bicycle route | Figure TC-2<br>TA-23 | • For preliminary planning purposes, pipeline construction assumed to occur in SB lane adjacent to center line (center NB lane is an alternative)<br>• SB: Closure of travel lanes, use of parking lane to provide 1SB travel lane<br>• NB: Closure of inside travel lane, use of outside travel lane and parking lane to provide 2 NB travel lanes<br>• Installation of temporary "share the road" signs for both NB and SB traffic | None: No parallel arterials adjacent to Telegraph Ave. | Sidewalk would remain open on one side of street | Temporary delays for SB buses (AC Transit Line 800) | Shared lanes with auto traffic |
| **Stuart Street** (Telegraph Ave. to Hillegass Ave.) | • 2-lane residential<br>• 36 feet wide<br>• Parking both sides<br>• 1,950 VPD | Segment: TA-20<br>Intersection (Regent St.): TA-26/TA-27 | • Block-long closure of traffic and parking lanes<br>• Staged construction across intersections with directed access facilitated by flaggers | Telegraph Ave., Derby Street, College Ave. | Sidewalk would remain open on one side of street | No transit route on segment | Detoured to identified routes |

**TABLE 2-8 (Continued)**
**TRAFFIC CONTROL SCHEMES FOR THE WILDCAT PIPELINE (BERKELEY)**

| Segment Limits or Intersection | Segment or Intersection Characteristics | Traffic Control Plan Figure or CA-MUTCD Typical Application (TA)[a] (see Appendices D and E) | Traffic Handling Detail | Detour Routes (see Figure TC-1 ) | Pedestrian | Transit | Cyclist |
|---|---|---|---|---|---|---|---|
| **Hillegass Ave.** (Stuart Street to Woolsey Street) | • 2-lane residential<br>• 36 feet wide<br>• Parking both sides<br>• 1,550 VPD<br>• Class III shared bicycle route | Segment: TA-20<br><br>Intersections (Russell St., Ashby Ave., & Webster St.): TA-26/TA-27 | • Block-long closure of traffic and parking lanes<br>• Staged construction across intersections with directed access facilitated by flaggers | Stuart Street, College Ave., Woolsey Street | Sidewalk would remain open on one side of street | No transit route on segment | Detoured to alternate bicycle routes on Regent St. or Benvenue Ave. |
| **Woolsey Street** (Hillegass Ave. to Claremont Ave.) | • 2-lane residential<br>• 36 feet wide<br>• Parking both sides<br>• 764 VPD<br>• Class III shared bicycle route | Segment: TA-20<br><br>Intersection (College Ave.): TA-26/TA-27 | • Block-long closure of traffic and parking lanes<br>• Staged construction across intersections with directed access facilitated by flaggers | Hillegass Ave., Ashby Ave., College Ave., Alcatraz Ave., Claremont Ave. | Sidewalk would remain open on one side of street | No transit route on segment, but temporary delays for SB buses on Claremont Ave. during construction at intersection | Detoured to identified routes |
| **Claremont Ave.**<br>(Woolsey Street to The Uplands) | • 4-lane arterial<br>• 55 feet wide<br>• Parking both sides<br>• 12,600 VPD<br>• Class II bicycle route | Similar to Figure TC-2 TA-23 | • For preliminary planning purposes, pipeline construction assumed to occur in NB lane adjacent to center line (SB lane near center is an alternative)<br>• NB: Closure of travel lanes, use of parking lane to provide 1 NB travel lane<br>• SB: Closure of inside travel lane, use parking lane to provide one SB travel lane<br>• Installation of temporary "share the road" signs | None: No parallel arterials adjacent to Claremont Ave. | Sidewalk would remain open on one side of street | Temporary delays for NB buses (AC Transit Lines E and 49) | Shared lanes with auto traffic |
| **The Uplands** (Claremont Ave. to median crossing) | • 2-lane residential<br>• 30 to 50 feet wide<br>• Parking both sides<br>• 1,850 VPD | Segment (Western): TA-18; (Eastern):TA-20<br><br>Intersection (Claremont Ave.): TA-26/TA-27 | • In wider western portion, closure of one travel lane with both directions of traffic sharing other lane<br>• In narrower eastern portion, closure of traffic and parking lanes<br>• Staged construction across intersections with directed access facilitated by flaggers | Claremont Ave., Hillcrest Road | Sidewalk would remain open on one side of street | No transit route on segment | Detoured to identified routes |

**TABLE 2-8 (Continued)**
**TRAFFIC CONTROL SCHEMES FOR THE WILDCAT PIPELINE (BERKELEY)**

| Segment Limits or Intersection | Segment or Intersection Characteristics | Traffic Control Plan Figure or CA-MUTCD Typical Application (TA)[a] (see Appendices D and E) | Traffic Handling Detail | Detour Routes (see Figure TC-1 ) | Pedestrian | Transit | Cyclist |
|---|---|---|---|---|---|---|---|
| **Parkside Drive** (median crossing to Nogales St.) | • 2-lane residential<br>• 30 feet wide<br>• Parking both sides<br>• No VPD available | Segment: TA-20 | • Closure of traffic and parking lanes | Claremont Ave., Encina Place, The Plaza Drive, Nogales St. | Sidewalk would remain open on one side of street | No transit route on segment | Detoured to identified routes |
| **Tie-in @ Parkside Dr./Nogales St.** | • 3-way uncontrolled | Figure TC-4 | • Partial or full intersection closure | Claremont Ave., Encina Place, The Plaza Drive | Sidewalk would remain open on one side of each street | No transit route at intersection | Detoured to identified routes |
| **Benvenue Option** | | | | | | | |
| **Stuart St.** (Hillegass Ave. to Benvenue Ave.) | • 2-lane residential<br>• 36 feet wide<br>• Parking both sides<br>• 1,950 VPD | TA-20 | • Block-long closure of traffic and parking lanes | Telegraph Ave., Derby St., College Ave. | Sidewalk would remain open on one side of street | No transit route on segment | Detoured to identified routes |
| **Benvenue Ave.** (Stuart St. to Woolsey St.) | • 2-lane residential<br>• 36 feet wide<br>• Parking both sides<br>• 860 VPD | Segment: TA-20<br>Intersections (Russell St., Ashby Ave., Webster St., Woolsey St.): TA-26/TA-27 | • Block-long closure of traffic and parking lanes<br>• Staged construction across intersections with directed access facilitated by flaggers | Stuart St., College Ave., and Woolsey St. | Sidewalk would remain open on one side of street | No transit route on segment | Detoured to College Ave. or Hillegass Ave. |

NOTES:
NB = Northbound
SB = Southbound

SOURCE:
a Caltrans, *California Manual on Uniform Traffic Control Devices for Streets and Highways*, 2012

**TABLE 2-9**
**TRAFFIC CONTROL SCHEMES FOR THE WILDCAT PIPELINE (EL CERRITO)**

| Segment Limits or Intersection | Segment or Intersection Characteristics | Traffic Control Plan Figure or CA-MUTCD Typical Application (TA)[a] (see Appendices D and E) | Traffic Handling Detail | Detour Routes (see Figure TC-5 ) | Pedestrian | Transit | Cyclist |
|---|---|---|---|---|---|---|---|
| **Tie-in @ Hill St./Liberty St.** | • 2-way stop | Figure TC-6 | • Partial or full intersection closure | Elm St., Key Blvd., Cutting Blvd. (EB), Knott Ave. (WB), San Pablo Ave. | Sidewalk would remain open on one side of each street | Potential delay or detour. for AC Transit Route 684 | Detoured to identified routes |
| **Hill St.**<br>(Liberty St. to Elm St.) | • 2-lane EB residential<br>• 36 feet wide<br>• Parking both sides<br>• Class III shared bicycle route<br>• 2,050 VPD | TA-20 | • Block-long closure of traffic and parking lanes | Elm St., Key Blvd., Cutting Blvd. (EB), Knott Ave. (WB), San Pablo Ave. | Sidewalk would remain open on one side of street | Potential delay or detour for AC Transit Route 684 | Detoured to Lexington Ave. and Richmond St. |
| **Elm St.**<br>(Hill St. to Richmond St.) | • 2-lane residential<br>• 40 feet wide<br>• Parking both sides<br>• Class III shared bicycle route<br>• 6,750 VPD | Segment: TA-20<br>Intersection (Richmond/Blake): TA-26/TA-27 | • Block-long closure of traffic and parking lanes<br>• Staged construction across intersections with directed access facilitated by flaggers | Key Blvd., Cutting Blvd. (EB), Knott Ave. (WB), San Pablo Ave., Potrero Ave. | Sidewalk would remain open on one side of street | No transit route on segment | Detoured to identified routes |
| **Richmond St.**<br>(Elm St. to Lincoln Ave.) | • 2-lane residential<br>• 40 feet wide<br>• Parking both sides<br>• Class III shared bicycle route<br>• 6,250 VPD | Segment: TA-20<br>Intersections (Potrero Ave., Gladys Ave., Donal Ave., Manila Ave., Schmidt Ln., Portola Dr., Moeser Ln., Waldo Ave., Stockton Ave., Eureka Ave.): TA-26/TA-27 | • Block-long closure of traffic and parking lanes<br>• Staged construction across intersections with directed access facilitated by flaggers | Potrero Ave., San Pablo Ave., Manila Ave., Moeser Ln., Ashbury Ave., Stockton Ave., Lincoln Ave. | Sidewalk would remain open on one side of street | Potential delay or detour for AC Transit Route G | Detoured to identified routes |
| **Lincoln Ave.**<br>(Richmond St. to Norvell St.) | • 2-lane residential<br>• 30 feet wide<br>• Parking both sides<br>• 1,000 VPD | Segment: TA-20<br>Intersection (Everett St.): TA-26/TA-27 | • Block-long closure of traffic and parking lanes<br>• Staged construction across intersections with directed access facilitated by flaggers | Richmond St., Fairmount Ave., Norvell St. | Sidewalk would remain open on one side of street | No transit route on segment | Detoured to identified routes |
| **Norvell St.**<br>(Lincoln Ave. to Fairmount Ave.) | • 2-lane residential<br>• 28 feet wide<br>• Parking both sides<br>• 1,000 VPD | Segment: TA-20<br>Intersection (Central Ave.): TA-26/TA-27 | • Block-long closure of traffic and parking lanes<br>• Staged construction across intersections with directed access facilitated by flaggers | Richmond St., Lincoln Ave., Ashbury Ave., Fairmount Ave. | Sidewalk would remain open on one side of street | No transit route on segment | Detoured to identified routes |

**TABLE 2-9 (Continued)**
**TRAFFIC CONTROL SCHEMES FOR THE WILDCAT PIPELINE (EL CERRITO)**

| **Segment Limits or Intersection** | **Segment or Intersection Characteristics** | **Traffic Control Plan** Figure or CA-MUTCD Typical Application (TA)[a] (see Appendices D and E) | **Traffic Handling Detail** | **Detour Routes** (see Figure TC-5 ) | **Pedestrian** | **Transit** | **Cyclist** |
|---|---|---|---|---|---|---|---|
| **Fairmount Ave.**<br>(Norvell St. to Behrens St.) | • 2-lane residential<br>• 40 feet wide<br>• Parking both sides<br>• 8,720 VPD | TA-20 | • Block-long closure of traffic and parking lanes | Norvell St., Lincoln Ave., Ashbury Ave. | Sidewalk would remain open on one side of street | Potential delay or detour. for AC Transit Routes 25, 667, 668, 675 and G | Detoured to identified routes |
| **Behrens St.**<br>(Fairmount Ave. to C St.) | • 2-lane residential<br>• 30 feet wide<br>• Parking both sides<br>• 1,000 VPD | TA-20 | • Block-long closure of traffic and parking lanes | Fairmount Ave., Ashbury Ave., C St. | Sidewalk would remain open on one side of street | No transit route on segment | Detoured to identified routes |
| **C St.**<br>(Behrens St. to Ashbury Ave.) | • 2-lane residential<br>• 26 feet wide<br>• Parking both sides<br>• 1,000 VPD | TA-20 | • Block-long closure of traffic and parking lanes | Behrens St., Fairmount Ave, Ashbury Ave. | Sidewalk would remain open on one side of street | No transit route on segment | Detoured to identified routes |
| **Ashbury Ave.**<br>(C St. to Lynn Ave.) | • 2-lane arterial<br>• 78 feet wide<br>• Parking both sides<br>• 4,070 VPD | TA-20 for the SB approach | • For preliminary planning purposes, pipeline construction assumed to occur in SB lanes (may occur in NB lanes)<br>• SB: Closure of travel lanes<br>• NB: No closure, NB travel only | SB: Fairmount Ave., San Carlos Ave., Lynn Ave., Pomona Ave. | Sidewalk would remain open on one side of street | No transit route on segment | SB: detoured to identified routes |
| **Lynn Ave.**<br>(Ashbury Ave. to San Carlos Ave.) | • 2-lane residential<br>• 36 feet wide<br>• Parking both sides<br>• 1,000 VPD | Segment: TA-20<br>Intersections (Pomona Ave., Ramona Ave., Carmel Ave.): TA-26/TA-27 | • Block-long closure of traffic and parking lanes<br>• Staged construction across intersections with directed access facilitated by flaggers | Ashbury Ave., Fairmount Ave., San Carlos Ave. | Sidewalk would remain open on one side of street | No transit route on segment | Detoured to identified routes |
| **Tie-in @ Lynn Ave./San Carlos Ave.** | • 4-way stop | Figure TC-7 | • Partial or full intersection closure | Ashbury Ave., Fairmount Ave., San Carlos Ave. | Sidewalk would remain open on one side of each street | No transit route on segment | Detoured to identified routes |

NOTES:
NB = Northbound
SB = Southbound

SOURCE:
[a] Caltrans, *California Manual on Uniform Traffic Control Devices for Streets and Highways*, 2012

Because San Pablo Avenue carries a substantial amount of traffic on a daily basis, and there are no parallel adjacent roadways of similar classification, it is prudent to keep traffic on San Pablo Avenue to minimize traffic impacts to the surrounding neighborhoods in the city of El Cerrito. Based on the location of other underground utilities, it is expected that the proposed pipeline would be developed in the southbound lanes of San Pablo Avenue. Southbound traffic would be rerouted to the opposing northbound lanes by converting one of the northbound lanes to a southbound lane within the construction zone.

Buses and trucks traveling in the eastbound direction along Central Avenue and making left turns to go north on San Pablo Avenue will need to detour via Carlson Boulevard due to the work zone required for the pipeline tie-in construction at the San Pablo Avenue/Central Avenue intersection. Other vehicles traveling in the eastbound direction along Central Avenue and making left turns to go north on San Pablo Avenue will need to detour via Lexington Avenue and Lincoln Avenue. **Figure TC-8** shows the proposed detour routes for the Central Pressure Zone Pipeline (El Cerrito/Richmond) construction. **Figure TC-9** shows the typical traffic control plan for construction along San Pablo Avenue. A typical staged construction process across a major intersection along San Pablo Avenue (using the Potrero Avenue intersection as an example) is shown in **Figure TC-10**. **Figures TC-11** and **TC-12** show the traffic control plans for the tie-ins at Nevin Avenue and Central Avenue, respectively. **Table 2-10** contains the applicable traffic control schemes for this route, including CA-MUTCD typical applications.

## Central Pressure Zone Pipeline (Richmond/San Pablo)

The Central Pressure Zone Pipeline (Richmond/San Pablo) is located primarily along 23rd Street in the cities of Richmond and San Pablo. This is a three- to four-lane, north-south mixed residential and commercial arterial street. Throughout this segment, two-way traffic would be maintained during construction with the exception of the southernmost portion of 23rd Street which carries only northbound traffic (travel on this portion would also be maintained). While traffic would be maintained on 23rd Street along the construction route, through traffic would be advised of a detour route using changeable message signs or other means as approved by the Cities of Richmond and San Pablo. Portions of Brookside Drive and the intersection of Road 20 and 21st Street would be affected by a full road closure.

The traffic control schemes for this route are indicated in **Table 2-11**. **Figure TC-13** shows the proposed detour route for the Central Pressure Zone Pipeline (Richmond/San Pablo) construction. **Figures TC-14** and **TC-15** show the proposed traffic control plans for construction of the proposed tie-ins located at the intersection of Road 20 and 21st Street and the alternative tie-in location on Road 20 near San Pablo Avenue, respectively.

**Figures TC-16** through **TC-18** show the proposed traffic control plans for construction of the pipeline at various points along 23rd Street: at Brookside Drive, within the 3-lane segment (from Rheem Avenue to Wilcox Avenue), and within the 4-lane segment between Visalia Avenue and Gaynor Avenue. **Figure TC-19** shows the proposed traffic control plan for the construction of the tie-in at the intersection of 23rd Street and Nevin Avenue.

**TABLE 2-10**
**TRAFFIC CONTROL SCHEMES FOR THE CENTRAL PRESSURE ZONE PIPELINE (EL CERRITO/RICHMOND)**

| Segment Limits or Intersection | Segment or Intersection Characteristics | Traffic Control Plan Figure or CA-MUTCD Typical Application (TA)[a] (See Appendices D and E) | Traffic Handling Detail | Detour Routes (See Figure TC-8 ) | Pedestrian | Transit | Cyclist |
|---|---|---|---|---|---|---|---|
| **Tie-in @ San Pablo Avenue/Nevin Avenue** | • 2-way stop | Figure TC-11 | • Partial intersection closure<br>• SB right-turn traffic detoured as shown in Figure TC-11 | None (traffic will be kept on San Pablo Avenue). | Sidewalk would remain open on one side of each street | Temporary delays for (AC Transit Lines 7,72,72R,L, and LC) buses in both directions | Shared lanes with auto traffic |
| **San Pablo Avenue**<br>(Nevin Avenue to Central Avenue) | • 4-lane arterial<br>• 78 feet wide<br>• Parking both sides<br>• 22,000 VPD | Segment: Figure TC-9<br>Intersections (MacDonald Ave., Cutting Blvd., Hill St., Potrero Ave., Manila Ave., Moeser Ln.): TA-23 for work between intersections; left turns prohibited when necessary | • Pipeline construction assumed to occur in a SB travel lane ]<br>• Block-long closure of SB travel and parking lanes<br>• NB: Restriction of parking on east side, use of NB travel lanes and parking lane to provide 1 NB and 1 SB travel lane<br>• Temporary signal timing to progress traffic through construction zones | None | Sidewalk would remain open on one side of street | Temporary delays for (AC Transit Lines 7,72,72M, 72R,L, LC,667,668,800) buses in both directions | Shared lanes with auto traffic |
| **Tie-in @ San Pablo Avenue/Central Avenue** | • 4-way signaled | Figure TC-12 | • Partial intersection closure<br>• EB truck and bus traffic detoured via Carlson Boulevard. | San Pablo Ave., Fairmount Ave., Carlson Blvd. | Sidewalk would remain open on one side of each street | Temporary delays for buses (AC Transit Lines L, LC, and 800). AC Transit Lines L and LC will need to detour via Carlson Blvd. | Shared lanes with auto traffic |

NOTES:
NB = Northbound
SB = Southbound

SOURCE:
[a] Caltrans, *California Manual on Uniform Traffic Control Devices for Streets and Highways*, 2012

**TABLE 2-11**
**TRAFFIC CONTROL SCHEMES FOR THE CENTRAL PRESSURE ZONE PIPELINE (RICHMOND/SAN PABLO)**

| Segment Limits or Intersection | Segment or Intersection Characteristics | **Traffic Control Plan** Figure or CA-MUTCD Typical Application (TA)[a] (see Appendices D and E) | Traffic Handling Detail | **Detour Routes** (See Figure TC-13 ) | Pedestrian | Transit | Cyclist |
|---|---|---|---|---|---|---|---|
| **Tie-in @ Road 20/21st Street.** | • T-intersection<br>• 1-way stop | Figure TC-14/TA-20 | • Full intersection closure | 20th St, 22nd St., Love Grove Ave., (Figure TC-14) | Sidewalk would remain open on one side of each street | No transit route at intersection | Detoured as shown in Figure TC-14 |
| **Optional Tie-in @ Road 20/Kennedy Plaza** | • City park | Figure TC-15 | • Closure of one travel lane<br>• Two-way traffic maintained by flaggers in the remaining travel lane | None | Sidewalk would remain open on one side of street | No effect | No effect |
| **Brookside Drive**<br>(21st Street to 23rd Street) | • 2-lane residential<br>• 40 feet wide<br>• Parking both sides<br>• 3,200 VPD | Intersection (23rd St.): Figure TC-16<br>Segment: TA-8, TA-20 | • Full road closure | Rumrill Blvd, Market Ave | Sidewalk would remain open on one side of street | No transit route on segment | Detoured as shown in Figure TC-16 |
| **23rd Street**<br>(Brookside Drive to Maricopa Avenue/Costa Avenue) | • 3-lane arterial<br>• 52 feet wide<br>• Parking both sides<br>• Class II bicycle route<br>• 15,600 VPD | Figure TC-17 | • For preliminary planning purposes, pipeline construction assumed to occur along 23rd Street on the east side of the street<br>• Closure of parking lane on the east side of the street and central left-turn lane<br>• Closure of bicycle lanes in both directions<br>• One travel lane in each direction maintained<br>• Side-street approaches closed | See Figure TC-17 | Sidewalk would remain open on one side of street | Potential delays to AC Transit Route 74 | Shared lanes with auto traffic or detoured as shown in Figure TC-17 |
| **23rd Street**<br>(Maricopa Avenue/ Costa Avenue to Brooks Ave) | • 4-lane arterial<br>• 62 feet wide<br>• Parking both sides<br>• 25,100 VPD | Figure TC-18/TA-20<br>TA-24 | • Closure of parking lane on the east side of the street and one travel lane in each direction<br>• One travel lane in each direction maintained<br>• Side-street approaches closed | See Figure TC-18 | Sidewalk would remain open on one side of street | Potential delays to AC Transit Route 74 | Shared lanes with auto traffic or detoured as shown in Figure TC-18 |
| **23rd Street**<br>(Brooks Avenue to Nevin Avenue) | • 3-lane NB arterial<br>• 56 feet wide<br>• Parking both sides<br>• 14,300 VPD | Figure TC-19 | • Closure of one travel lane and one parking lane<br>• Side-street approaches closed | Nevin Ave., Barrett Ave., 24th St. (Figure TC-19) | Sidewalk would remain open on one side of street | Potential delays to AC Transit Route 74 | Shared lanes with auto traffic or detoured as shown in Figure TC-19 |
| **Tie-in @ 23rd St./ Nevin Ave.** | • 4-way signaled | Figure TC-19<br>TA 22B | • Partial or full intersection closure | | Sidewalk would remain open on one side of each street | Potential delays to AC Transit Route 74 | Detoured as shown in Figure TC-19 |

NOTES: NB = Northbound; SB = Southbound

SOURCE: [a] Caltrans, California Manual on Uniform Traffic Control Devices for Streets and Highways, 2012

## 2.9 Operation and Maintenance

Six main operations and maintenance activities would periodically occur for the pipelines:

- Flushing
- Hydrant testing
- Anode replacement
- Leak detection
- Leak repair
- ROW maintenance
- Valve preventative maintenance

### 2.9.1 Flushing

Flushing is conducted to remove particles, rust, or old water that has lost its chlorine residual. Pipelines may also be chlorinated and flushed after a main break, if there is a possibility of contamination, to remove any biological contamination and/or particles that may have entered the pipeline during the break. Large transmission pipelines, such as those proposed for this Project, generally carry a high flow of water that prevents sediment build-up, removes rust, and keeps the water fresh. As a result, large transmission mains are typically only flushed when there is a reported water quality problem or following a main break.

### 2.9.2 Hydrant Testing

Fire hydrants are occasionally flow tested to check the functioning of the hydrant valves and to confirm sufficient flow and pressure within the distribution system. Hydrant flow tests may be conducted by EBMUD or local fire agencies; however, there is no fixed schedule for testing.

### 2.9.3 Anode Replacement

Welded steel pipelines are often protected from corrosion by a cathodic protection system. The anodes used in a cathodic protection system require replacement about once every 25 years. Anode replacement involves using a drill rig or backhoe to make a hole for the anode, placing the anode underground, connecting wires to the cathodic protection system, and backfilling the hole.

### 2.9.4 Leak Detection

EBMUD conducts routine leak detection on its pipelines. Several different methods are used, including deployment of internal pipeline probes and external listening devices. Both of these methods can be performed while the pipeline is in-service, and are completed by small crews driving pickup trucks or vans.

### 2.9.5 Leak Repair

Leak repair requires excavating down to the pipeline, fixing the leak, replacing the soil, and repaving the street. Small leaks are often repaired using clamps that fit over the pipeline. Large leaks can require that a portion of existing pipeline be removed and replaced with a new piece of pipe.

### 2.9.6 Right-of-Way Maintenance

EBMUD conducts routine inspections and maintenance to identify and remove vegetation from areas above water pipelines. Pipelines that are installed in roadways require height adjustments to the valve pots when the roadway is repaved or otherwise reconstructed, so that the valve pots do not end up sitting too low or too high for the new roadway.

### 2.9.7 Valve Preventative Maintenance

Valves would be installed along the pipelines to allow EBMUD to isolate a reach of pipeline for a maintenance activity or repair. Additional valves would be installed to isolate one pressure zone from another. The maintenance program for these valves consists of locating, cleaning and exercising the valves attached to transmission mains once every two years. Any broken valves that are discovered would be repaired or replaced.

## 2.10 Intended Uses of the EIR

Section 1.1 in Chapter 1, Introduction, describes the purpose of this EIR. The information contained in the EIR and the administrative record will be reviewed and considered by the EBMUD Board of Directors prior to the ultimate decision to approve, disapprove, or modify the West of Hills Northern Pipelines Project.

## 2.11 Permits and Approvals

**Table 2-12** lists the other agencies that are expected to use this EIR in their decision-making, as well as the permits, other approvals, and consultation requirements that may be required to implement the Project.

## 2.12 Land Acquisition

A majority of the proposed alignments are within the public ROW or are located on property owned by EBMUD, and thus will not require any permanent acquisition of land. The Central Pressure Zone Pipeline (Richmond/San Pablo) would go under Wildcat Creek using the jack and bore method. The jacking pit is proposed to be placed on the adjacent vacant property (APN 411-281-015-7), which is owned by the City of San Pablo. A temporary easement would need to be obtained to allow construction on this parcel, and a permanent easement would need to be obtained to allow for maintenance of the pipeline. The San Pablo Avenue option of the Central Pressure Zone Pipeline (Richmond/San Pablo) would require both temporary and permanent easements to develop the pipe bridge crossing of San Pablo Creek within the Kennedy Plaza Park owned by the city of San Pablo (APN 411-282-001).

## 2.13 Aerial Maps

Aerial maps of the pipeline alignments are provided as **Figures 2-15** through **2-17**.

**TABLE 2-12**
**REQUIRED PERMITS**[1]

| Agency | Permit/Approval | Pipeline Segment |
|---|---|---|
| City of Berkeley | Encroachment Permit for work within City streets<br>Approval for use of City sewer line or storm drains for dewatering activities | Wildcat Pipeline (Berkeley) |
| City of El Cerrito | Encroachment Permit for work within City streets<br>Approval for use of City sewer line or storm drains for dewatering activities | Wildcat Pipeline (El Cerrito)<br>Central Pressure Zone Pipeline (El Cerrito/Richmond) |
| City of Richmond | Encroachment Permit for work within City streets<br>Approval for use of City sewer line or storm drains for dewatering activities | Central Pressure Zone Pipeline (El Cerrito/Richmond)<br>Central Pressure Zone Pipeline (Richmond/San Pablo) |
| City of San Pablo | Encroachment Permit for work within City streets<br>Approval for use of City sewer line or storm drains for dewatering activities | Central Pressure Zone Pipeline (Richmond/San Pablo) |
| Stege Sanitary District | Approval for use of sewer line for dewatering activities | Wildcat Pipeline (El Cerrito)<br>Central Pressure Zone Pipeline (El Cerrito/Richmond) |
| California Department of Transportation | Encroachment Permit | Wildcat Pipeline (Berkeley)<br>Central Pressure Zone Pipeline (El Cerrito/Richmond). |
| California Department of Transportation | Transportation Permit | All pipelines |
| California Department of Fish and Wildlife | Streambed Alteration Agreement | Central Pressure Zone Pipeline (Richmond/San Pablo) |
| California Regional Water Quality Control Board | National Pollution Discharge Elimination System Construction General Permit | All pipelines |
| California Regional Water Quality Control Board | Waste Discharge Requirements for dewatering and work within the bed and banks of waters of the State | Central Pressure Zone Pipeline (Richmond/San Pablo) |

NOTES:

1 Because the pipe bridge (including footings) proposed under the Central Pressure Zone Pipeline (Richmond/San Pablo) will be above the ordinary high water mark of San Pablo Creek, Clean Water Act Section 404 and 401 permits are not expected to be necessary.

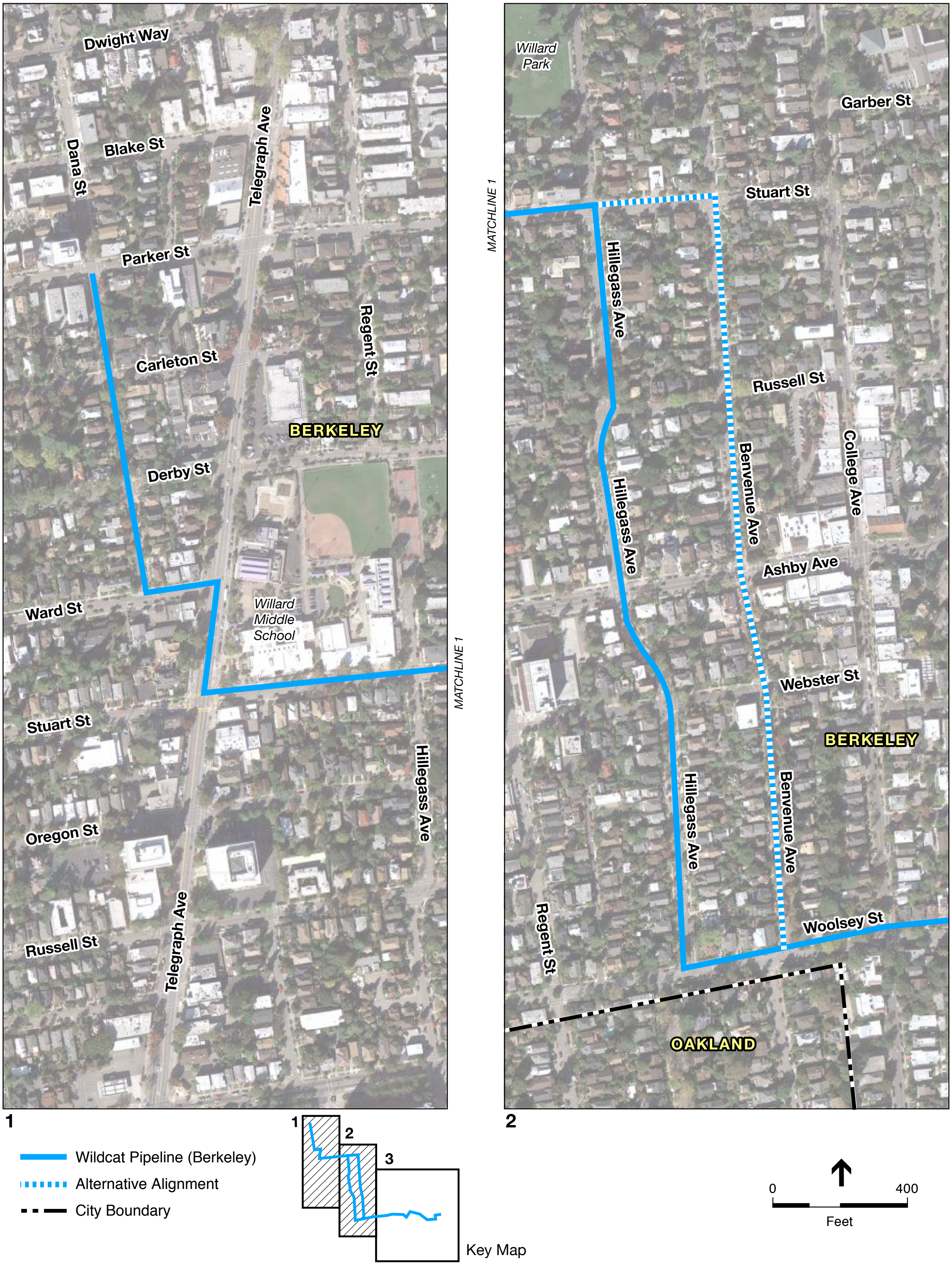
# References

California Department of Transportation (Caltrans), *California Manual on Uniform Traffic Control Devices for Streets and Highways*, amended January 13, 2012.

East Bay Municipal Utility District (EBMUD). 2010. *West of Hills Master Plan*. March 2010.

East Bay Municipal Utility District (EBMUD). 2011. *Urban Water Management Plan 2010*. June 2011.

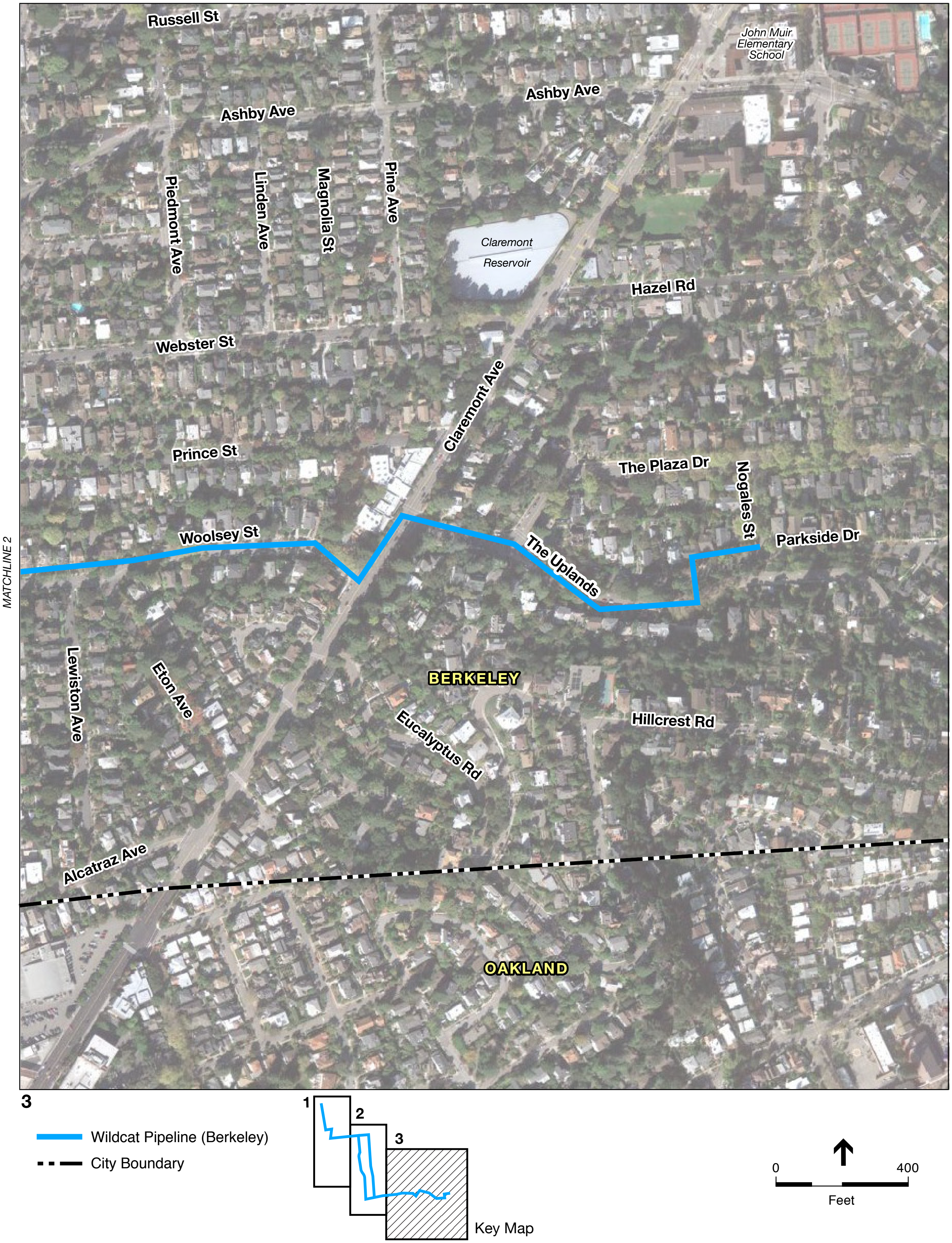
East Bay Municipal Utility District (EBMUD). 2012. *West of Hills Northern Pipelines Project Alignment Study*. June 2012.




SOURCE: ESA; Google Maps

EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-15**
Wildcat Pipeline (Berkeley)
Maps 1 and 2




SOURCE: ESA; Google Maps

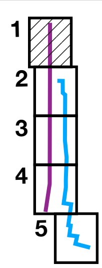
EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-15**
Wildcat Pipeline (Berkeley)
Map 3


Wildcat Pipeline (El Cerrito)

Central Pressure Zone Pipeline (El Cerrito/Richmond)

City Boundary




Key Map

0 400

Feet

SOURCE: ESA; Google Maps

EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-16**
Wildcat Pipeline (El Cerrito) and Central Pressure Zone Pipeline (El Cerrito) Map 1

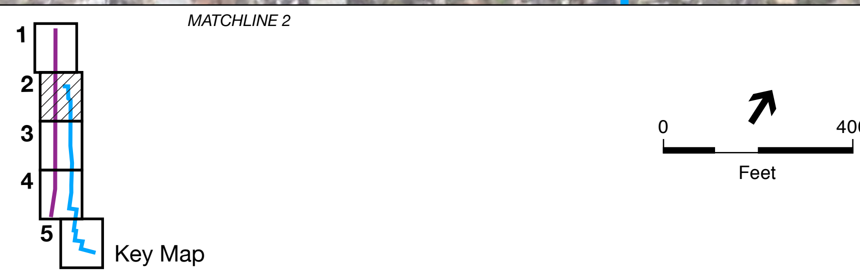
MATCHLINE 1


MATCHLINE 2

Wildcat Pipeline (El Cerrito)

Central Pressure Zone Pipeline (El Cerrito/Richmond)

City Boundary




SOURCE: ESA; Google Maps

EBMUD West of Hills Northern Pipelines . 211488

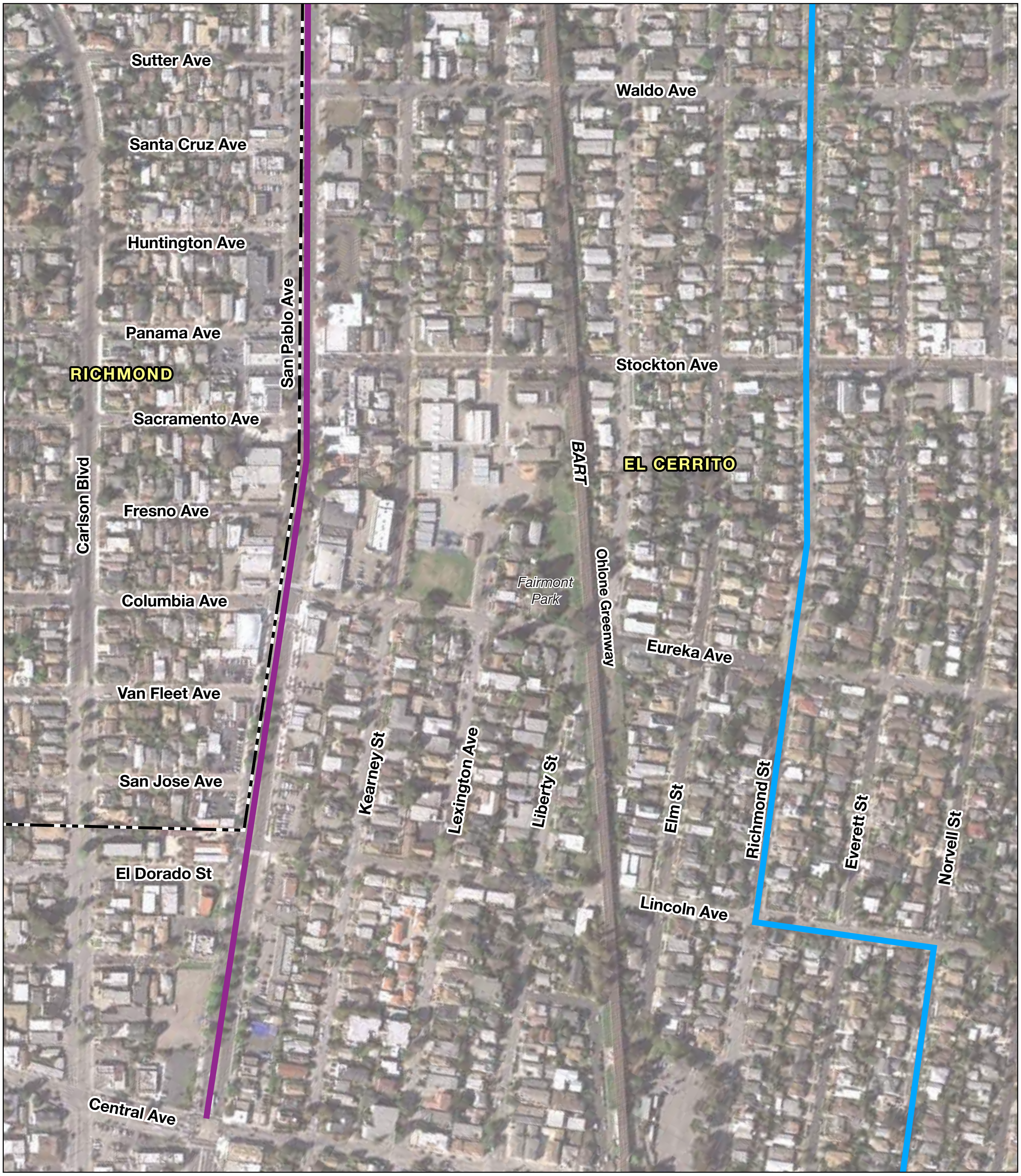
**Figure 2-16**
Wildcat Pipeline (El Cerrito) and
Central Pressure Zone Pipeline (El Cerrito)
Map 2


SOURCE: ESA; Google Maps

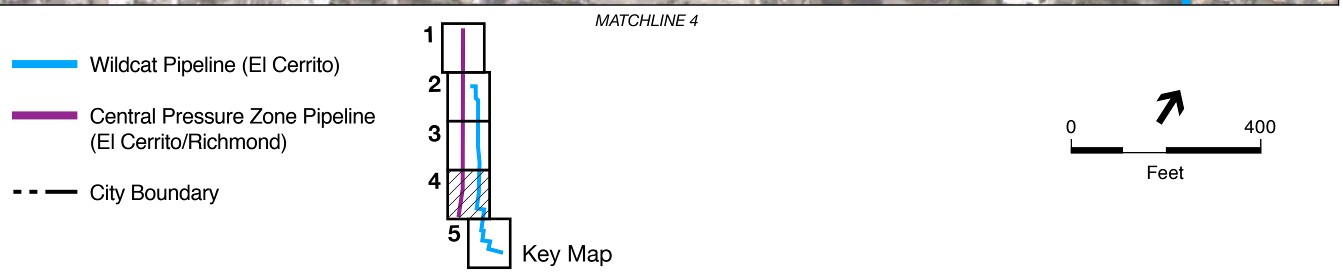
EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-16**
Wildcat Pipeline (El Cerrito) and Central Pressure Zone Pipeline (El Cerrito) Map 3

MATCHLINE 3




MATCHLINE 4

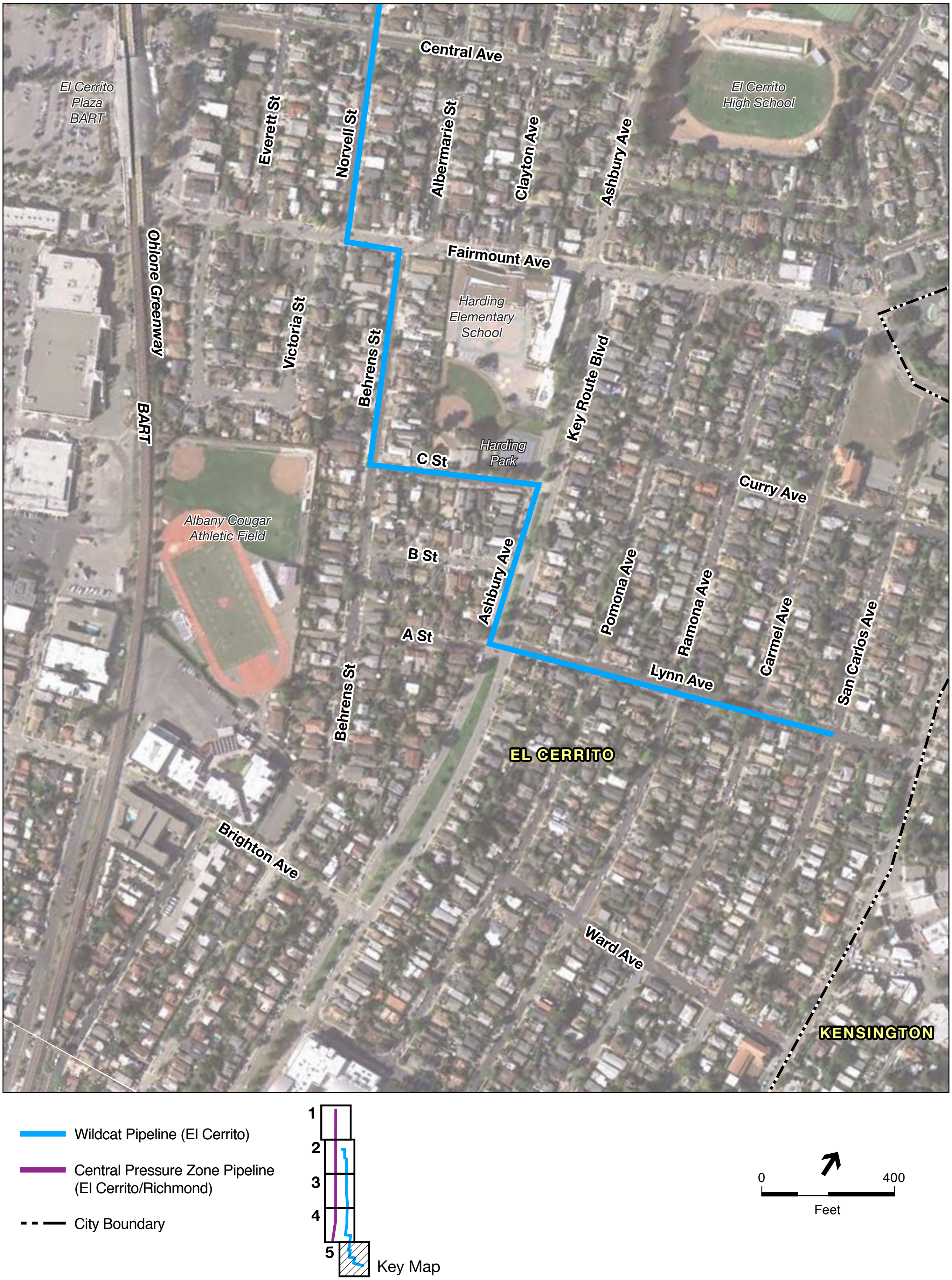



SOURCE: ESA; Google Maps

EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-16**
Wildcat Pipeline (El Cerrito) and
Central Pressure Zone Pipeline (El Cerrito)
Map 4

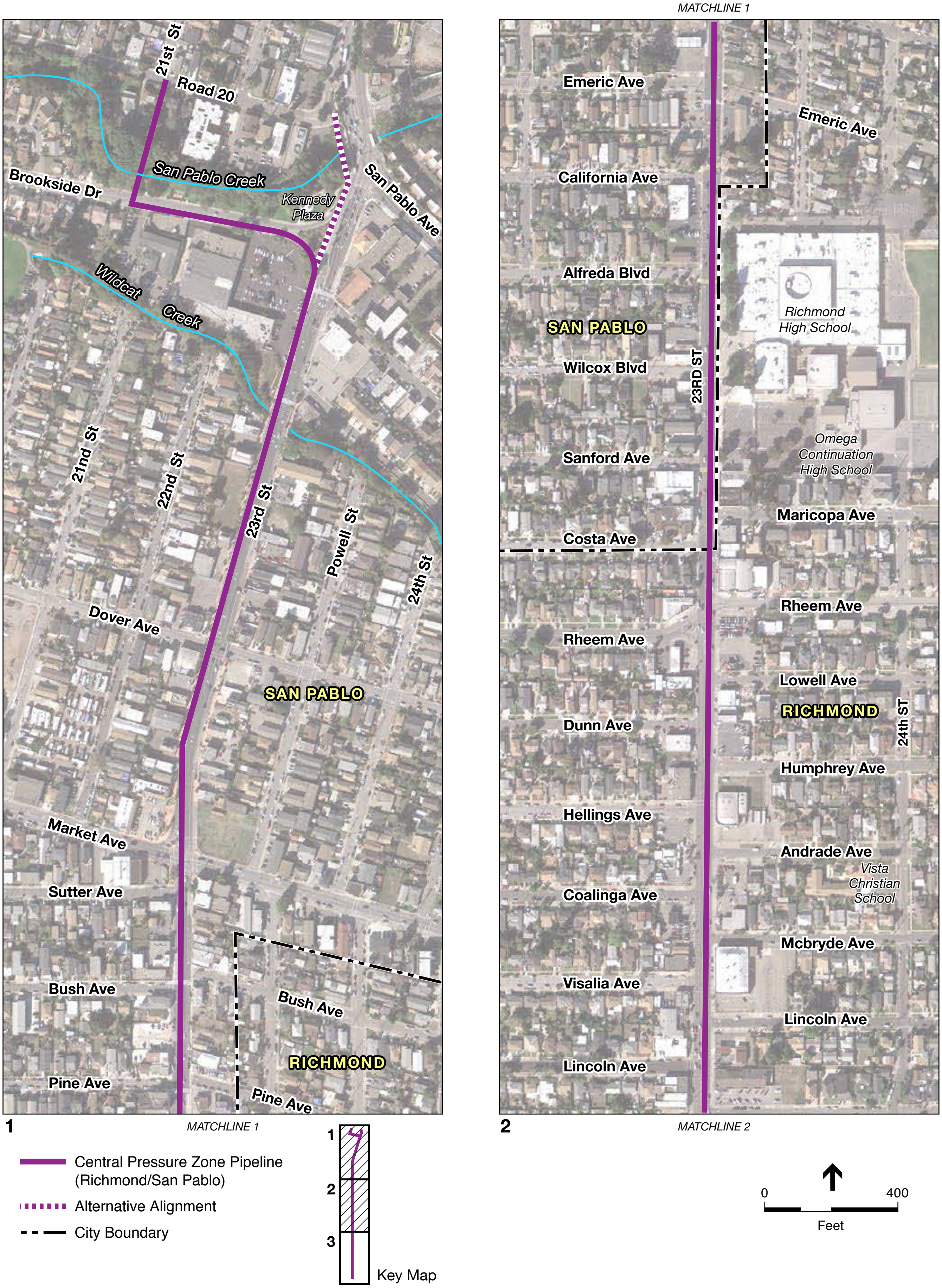
MATCHLINE 4




SOURCE: ESA; Google Maps

EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-16**
Wildcat Pipeline (El Cerrito) and
Central Pressure Zone Pipeline (El Cerrito)
Map 5




SOURCE: ESA; Google Maps

EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-17**
Central Pressure Zone Pipeline (Richmond/San Pablo)
Maps 1 and 2



SOURCE: ESA; Google Maps

EBMUD West of Hills Northern Pipelines . 211488

**Figure 2-17**
Central Pressure Zone Pipeline (Richmond/San Pablo) Map 3

# CHAPTER 3
# Environmental Setting, Impacts, and Mitigation Measures

## 3.1 Introduction

### 3.1.1 Organization of Chapter 3

Chapter 3 is organized by environmental discipline, as follows:

3.2 Aesthetics
3.3 Air Quality
3.4 Biological Resources
3.5 Cultural Resources
3.6 Energy Conservation
3.7 Geology and Soils
3.8 Greenhouse Gas Emissions
3.9 Hazards and Hazardous Materials
3.10 Hydrology and Water Quality
3.11 Noise
3.12 Recreation
3.13 Transportation and Traffic

Each section of Chapter 3 provides the following, based on requirements of CEQA.

#### Approach to Analysis

This subsection describes the general approach to analyzing a given environmental topic and cross-references related issues addressed elsewhere in this EIR.

#### Setting/Regulatory Framework

This subsection presents a description of the existing physical environmental conditions in the vicinity of the proposed Project and pertinent regulations including local and regional plans.

#### Significance Criteria

Refer to the discussion presented in Section 3.1.3.

### Impacts and Mitigation Measures

Refer to the discussions presented in Sections 3.1.3 and 3.1.4.

## 3.1.2 Impact Significance

In Chapter 3, the environmental impacts of the proposed Project are identified and classified as either significant or less than significant. Section 15382 of the CEQA Guidelines defines a significant impact as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project."

For each category of physical conditions evaluated in this EIR, criteria for significance have been developed, using the CEQA Guidelines, city and county standards and policies, or the "significance thresholds" of federal, state, regional, or local agencies. Impacts classified as significant meet the criteria for significance developed for each category of physical conditions. Impacts that are not significant (because they do not meet the significance criteria) are identified as less than significant. These less-than-significant impacts include conditions where there is no measurable physical change in the environment, i.e., no impact.

Impacts were determined by comparing the environmental effects of constructing and operating the West of Hills Northern Pipelines Project with existing environmental conditions. Chapter 5 addresses cumulative impacts associated with the proposed Project.

## 3.1.3 Mitigation Measures

CEQA Guidelines Section 15126.4(a) (1) states that an EIR "shall describe feasible measures, which could minimize significant adverse impacts..." Section 15126.4(a) (3) also states that "mitigation measures are not required for effects, which are not found to be significant." In this EIR, mitigation measures are identified (where feasible) for all of the significant impacts and for some of the impacts labeled as less than significant, and the residual effect after mitigation is noted. In general, the mitigation measures proposed reduce potential impacts to a less-than-significant level after mitigation, but for three resource issues, impacts were identified that remain significant and unavoidable, even with mitigation (Aesthetics, Noise and Vibration and Transportation and Traffic). All mitigation measures noted are proposed as part of the proposed Project, including the optional measures proposed for impacts considered to be less than significant.

Mitigation measures would be incorporated into contract specifications to be implemented by contractors (or EBMUD), and monitored by EBMUD. The MMRP prepared for the proposed Project identifies the responsible parties through each phase, from Design and Construction to Operations and Maintenance.

# 3.2 Aesthetics

This section addresses the potential aesthetic and visual quality impacts associated with implementation of the proposed West of Hills Northern Pipelines Project. Aesthetic resources, commonly referred to as visual resources, are defined as the visible natural and built landscape features that surround a project site. This section describes the existing visual setting in the project vicinity and evaluates the potential effects of the proposed Project on visual resources, including views from designated scenic roads, scenic areas, and public view corridors.

## 3.2.1 Setting

### Local Setting

#### *Visual Character*

##### Wildcat Pipeline (Berkeley)

Land uses along the proposed alignment of the Wildcat Pipeline (Berkeley) are entirely urban consisting mainly of single family residential development with small business districts on Claremont Avenue near The Uplands and at the corner of Telegraph Avenue and Stuart Street. The residential areas are characterized by single family homes along tree-lined streets (**Photo 1**, **Figure 3.2-1**). In addition, there is a narrow greenbelt (approximately 30 to 40 feet wide) that runs between The Uplands and Parkside Drive from Encina Place to Plaza Drive which includes a walking path with a variety of native and non-native mature trees (**Photo 2, Figure 3.2-1**).

##### Wildcat Pipeline (El Cerrito)

Land uses along the proposed alignment of the Wildcat Pipeline (El Cerrito) are mainly single-family residential (**Photo 3**, **Figure 3.2-2**). The alignment passes by Harding Park at C Street and Ashbury Avenue (**Photo 4**, **Figure 3.2-2**). Harding Park includes tennis courts, a baseball diamond, a jungle gym, a grassy picnic area and a recreational clubhouse. The alignment also passes in front of Windrush School at 1800 Elm Street (**Photo 5**, **Figure 3.2-2**).

##### Central Pressure Zone Pipeline (El Cerrito/Richmond)

The proposed alignment of the Central Pressure Zone Pipeline (El Cerrito/Richmond) runs along San Pablo Avenue. San Pablo Avenue is a four-lane principal arterial roadway. Topography along the alignment is mainly flat, and land uses along the alignment are entirely urbanized consisting mainly of commercial establishments including commercial strip malls, motels, shops and restaurants fronting San Pablo Avenue (**Photos 6 and 7**, **Figure 3.2-3**). The alignment passes in front of El Cerrito City Hall, El Cerrito Fire and Police Department and Saint John School the Baptist School.

Photo 1: Typical residential area along Woolsey Street.

Photo 2: The greenbelt area between the Uplands and Parkside Drive.

SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure 3.2-1**

Photos of Project Site - Wildcat Pipeline (Berkeley)

Photo 3: Typical residential area along Richmond Street.


Photo 4: View of Harding Park from the corner of C Street and Ashbury Street.

Photo 5: View of the Windrush School and adjacent street from the intersection of Hill Street and Key Boulevard.

SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure 3.2-2**

Photos of Project Site - Wildcat Pipeline (El Cerrito)

Photo 6: View of San Pablo Avenue near the southern end of the proposed alignment.

Photo 7: View of San Pablo Avenue near the northern end of the proposed alignment.

SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure 3.2-3**

Photos of Project Site - Central Pressure Zone Pipeline (El Cerrito/Richmond)

#### Central Pressure Zone Pipeline (Richmond/San Pablo)

The majority of the proposed alignment of the Central Pressure Zone Pipeline (Richmond/San Pablo) runs along 23rd Street in the cities of Richmond and San Pablo. 23rd Street is a principal arterial with two to four travel lanes. Topography is mainly flat and land use consists mainly of business and commercial establishments with some single-family and multi-family residential, as shown in (**Photo 8**, **Figure 3.2-4**). The alignment passes by Richmond High School and Grant Elementary School.

Near the northern terminus of the proposed alignment, the pipeline crosses Wildcat and San Pablo Creeks. Wildcat Creek is an intermittent creek while San Pablo Creek is a perennial creek (City of San Pablo, 2011). Both are highly urbanized. Wildcat Creek is contained within a culvert beneath 23rd Street where the proposed Central Pressure Zone Pipeline (Richmond/San Pablo) crosses the creek. In the project area, San Pablo Creek flows within its natural bed and is lined with a buffer of riparian vegetation, generally about 30 to 50 feet on either side of the banks, consisting of native and non-native species including willow, box-elder, alder, California buckeye, California bay and coast live oak. **Photo 9** of **Figure 3.2-4** shows San Pablo Creek as seen looking west from the San Pablo Avenue bridge over the creek.

The proposed alignment of the Central Pressure Zone Pipeline (Richmond/San Pablo) would cross underneath Wildcat Creek and would include a pipe bridge over San Pablo Creek at one of two locations as shown in Figure 2-9 in Chapter 2, *Project Description*. In the preferred alignment, the pipe bridge would cross San Pablo Creek in an EBMUD-owned utility corridor consisting of two EBMUD-owned properties that span the creek between Brookside Drive and Road 20. Vegetation within and adjacent to the EBMUD utility corridor is very dense with a full canopy cover over the creek. In **Photo 10** of **Figure 3.2-5,** the EBMUD utility corridor can be seen as a cluster of vegetation between the two houses (looking south from Road 20). **Photo 11** of **Figure 3.2-5** shows the EBMUD utility corridor as seen from Brookside Drive. In the San Pablo Avenue Option alignment, the pipe bridge would cross San Pablo Creek adjacent to the San Pablo Avenue Bridge. As shown in **Photo 12**, **Figure 3.2-6**, this reach of the creek is characterized by less dense herbaceous vegetation with no canopy cover.

Near the intersection of Brookside Drive and 23rd Street, the alignment passes in front of Kennedy Plaza, which includes a small grassy area, a concrete plaza with sitting benches, a small fountain and ornamental landscaping (**Photo 13**, **Figure 3.2-6**).

## 3.2.2 Regulatory Setting

### Federal Regulations

No federal regulations related to aesthetics apply to the proposed Project.

### State Regulations

No state regulations related to aesthetics apply to the proposed Project.

Photo 8: View of 23rd Street looking north near Hellings Avenue.

Photo 9: View of San Pablo Creek looking west from the San Pablo Avenue bridge.

SOURCE: ESA



**Figure 3.2-4**

Photos of Project Site - Central Pressure Zone Pipeline (Richmond/San Pablo)

Photo 10: View of the EBMUD utility corridor (vegetation between the two houses) looking south from Road 20.

Photo 11: View of the EBMUD utility corridor looking west along Brookside Drive. The utility corridor is delineated by the black metal fence located on the right side of the photo.

SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure 3.2-5**

Photos of Project Site - Central Pressure Zone Pipeline (Richmond/San Pablo)

Photo 12: View of the San Pablo Avenue bridge and pedestrian walkway over San Pablo Creek from Road 20 on the north side of the creek.

Photo 13: View of Kennedy Plaza from Brookside Drive.

SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure 3.2-6**

Photos of Project Site - Central Pressure Zone Pipeline (Richmond/San Pablo)

### Local Policies

At the local level, aesthetic quality is addressed through implementation of general plan policies, which provide guidelines for preserving and enhancing the visual character and scenic resources of an area. Potential inconsistencies between the proposed Project and general plan policies are discussed below under Section 3.2.3. It is EBMUD's practice to work closely with host jurisdictions and the neighboring communities during project planning and to conform to local land use plans and policies to the extent practical.

The applicable local policies regarding aesthetics are identified below. These policies generally address the protection of trees and other aesthetic resources.

The *City of Berkeley General Plan* (City of Berkeley, 2001) contains several policies related to the protection of trees. Policy EM-29 requires the maintenance, enhancement and preservation of street and park trees. Policy UD-9 requires that any tree replacement maintain historic planting patterns and native species consistent with the City of Berkeley 1990 Street Tree Policy.

The *City of El Cerrito General Plan* (City of El Cerrito, 1999) policy CD3.1 requires the preservation of existing significant tree groupings and replacement of trees removed during site development.

The City of San Pablo's *General Plan 2030* (City of San Pablo, 2011) policy OSC-I-10 requires the maintenance, protection and enhancement of San Pablo and Wildcat Creeks as local environmental and aesthetic resources.

The City of Richmond's *Richmond General Plan 2030* policy CF1.3 requires consideration of aesthetic impacts in siting new utilities and other infrastructure and policy CN6.2 requires protection of native trees and maintenance of street trees.

## 3.2.3 Impacts and Mitigation Measures

### Significance Criteria

For the purposes of this EIR and consistent with Appendix G of the CEQA Guidelines, the West of Hills Northern Pipelines Project is considered to have a significant impact if it would:

- Have a substantial adverse effect on a scenic vista.
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
- Substantially degrade the existing visual character or quality of the site and its surroundings.
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

The significance determination is based on several evaluation criteria, including the extent of project visibility from sensitive viewing areas such as designated scenic routes, public open space, or residential areas; the degree to which the various project elements would contrast with or be integrated into the existing landscape; the extent of change in the landscape's composition and character; and the number and sensitivity of viewers (Smarden et al., 1986). Project conformance with public policies regarding visual quality was also taken into account.

As described in Chapter 2, *Project Description*, a majority of the proposed Project consists of underground pipelines that would not be visible to the public. The main potential visual effects associated with the construction of proposed underground facilities, including tree removal and short term visual effects from construction are described in the discussion under Impacts 3.2-1, 3.2-2 and 3.2-3. The proposed pipe bridge over San Pablo Creek and proposed air valves are the only above ground facilities associated with the Project. The potential visual effects associated with the construction of proposed aboveground facilities, are described in the discussion under Impacts 3.2-4 and 3.2-5.

## Approach to Analysis

### *Methodology*

The visual impact analysis considers view obstruction, negative aesthetic effects, and conflict with adopted environmental plans or goals. The visual assessment is based on field observations of the Project facility sites and surroundings in addition to review of topographic maps, Project drawings, and technical data supplied by EBMUD, aerial and ground-level photographs of the Project area, and public planning documents.

## Impacts and Mitigation Measures

**Impact 3.2-1: Short-term visual effects experienced from nearby areas during project construction (applies to all pipelines).**

Construction activities associated with the West of Hills Northern Pipelines Project would involve earthwork and the use of heavy equipment for pipelines installation and re-paving. Earthwork could periodically create dust. In accordance with the Environmental Requirements (Section 01 35 44) of EBMUD construction specifications, construction activities would be required to comply with EBMUD's standard best practices for dust control, which include preparation of a Dust Control and Monitoring Plan and implementation of dust control measures.

For the most part, pipeline construction projects would occur within urban/developed (residential and commercial) areas where temporary construction activities periodically occur. Construction activity would be highly noticeable for short periods of time (generally about two weeks) to land uses adjacent to the alignment, traffic, and others passing the work site. Project construction would be visible from places along public roadways and from within public open space and residential areas; construction would likely be most noticeable when seen at close range by neighboring residents at those sites that are not screened by buildings and landscaping.

Due to the limited duration of construction activities, potential visual impacts due to construction activities are considered *less than significant*.

---

**Impact 3.2-2: Short-term visual effects experienced from nearby areas due to nighttime construction lighting (applies to all pipelines).**

Construction is proposed to occur during daytime hours (8:00 am to 7:00 pm) on weekdays. However, construction of tie-ins at the ends of each pipeline segment may require one 24-hour construction period for each tie-in to accomplish the connection while minimizing service interruptions. Similarly, work could periodically occur at night at traffic intersections when required by encroachment permit conditions to minimize traffic impacts. Construction extending beyond normal daytime work hours may require the use of nighttime construction lighting. Nighttime construction lighting may be visible from adjacent residences and roadways and adversely affect nighttime view of the surrounding area.

> **Mitigation Measure AES-1:Reduce Nighttime Lighting.**
>
> To the extent practical, ensure that stationary lighting used during nighttime construction (if required) is of limited duration, shielded and directed downward or oriented such that the light source is not directed toward residential areas.

---

**Impact 3.2-3: Tree removal may affect visual character (applies to Wildcat Pipeline [Berkeley], Central Pressure Zone Pipelines [Richmond/San Pablo]).**

### Wildcat Pipeline (Berkeley)

A short segment of the Wildcat Pipeline (Berkeley) would be constructed within the park strip between The Uplands and Parkside Drive. The pipeline and construction corridor would be located to minimize impacts to trees; however, construction would require the removal of approximately two non-native ornamental trees and the trimming of the limbs and roots of additional trees located within the public right-of-way. Mature trees and native oaks would be avoided to the extent practical. As seen from adjacent locations, the tree removal could be noticed by local residences. However, because a substantial number of mature trees would remain along the greenbelt, it is expected that the tree removal associated with the proposed pipeline construction would be a minor change that would not substantially alter the area's general appearance. In addition, construction could require disturbance or removal of the landscaped roundabout at Hillegass Avenue and Webster Street. With implementation of Mitigation Measure AES-2, which requires the replacement of any trees and landscaping removed during construction, this impact would be *less than significant*.

### Central Pressure Zone Pipelines (Richmond/San Pablo)

As shown in Figure 2-9 of Chapter 2, Project Description, the Central Pressure Zone Pipeline (Richmond/San Pablo) would cross San Pablo Creek by a pipe bridge at one of two alignments. The proposed alignment utilizes an existing EBMUD utility corridor between Brookside Drive and Road 20 in San Pablo, while the San Pablo Avenue Option would be developed in the park at Kennedy Plaza owned by the City of San Pablo.

**Proposed Alignment Using EBMUD Utility Corridor.** As described in Section 2.7, under the heading "Tree Removal and Right of Way Maintenance", tree removal would be required to accommodate pipeline construction, to maintain access to EBMUD's right-of-way, and to protect an existing 24-inch transmission pipeline located in the corridor. While trees would only be removed within EBMUD-owned properties, construction and maintenance of the utility corridor may require the trimming of trees that are located on adjacent properties but have limbs and roots within the EBMUD-owned properties. On the north side of San Pablo Creek, adjacent to Road 20, EBMUD's property is 20-feet wide, and all trees would be removed from this property. On the south side of San Pablo Creek, the EBMUD property is approximately 45-feet wide, however tree removal would only occur in a 30-foot wide area along the pipeline alignment.

As identified under Impact 3.2-1, vegetation within and adjacent to the EBMUD utility corridor between Brookside Drive and Road 20 is thick, with a fully developed canopy. Tree removal within the corridor would be noticeable from Brookside Drive and Road 20 directly adjacent to the corridor, but not from locations further away from the corridor due to the screening of the surrounding trees on Brookside Drive, and surrounding trees, vegetation and homes on Road 20. In the long term, the tree canopy would fill in to close any gap created by tree removal. Per Mitigation Measure BIO-1d, a vegetation restoration plan would be developed to restore shrubs and other plants within EBMUD's right-of-way. Implementation of the vegetation restoration plan would reduce this impact to *less than significant*.

**San Pablo Avenue Option.** Tree removal associated with the San Pablo Avenue Option would potentially result in a more noticeable change in visual character. The proposed alignment of the pipe bridge would be clearly visible from the San Pablo Avenue bridge over San Pablo Creek, as well as from the northeast corner of Kennedy Plaza and the parking lot adjacent to Road 20 and San Pablo Avenue. Vegetation within the vicinity of the proposed alignment consists mainly of low growing shrubs and herbaceous vegetation, with the exception one California Buckeye and one white alder located on the southern bank of San Pablo Creek adjacent to San Pablo Avenue, which would likely be removed during construction. Removal of these trees would affect the visual character of the area and conflict with City of San Pablo *General Plan 2030* Policy OSC-I-10, which requires maintenance, protection and enhancement of the aesthetic value of San Pablo Creek. Per Mitigation Measure BIO-1d, a vegetation restoration plan would be developed and implemented to mitigate the removal of trees. Implementation of the vegetation restoration plan would reduce this impact to *less than significant*.

**Mitigation Measure AES-2: Tree Replacement and Landscaping Restoration.**

If construction of the Wildcat Pipeline (Berkeley) requires the removal of trees or landscaping within a public right-of-way, EBMUD will replant trees and restore landscaping consistent with the following guidelines:

- If any mature native tree (i.e., trees that are 6 inches in diameter at breast height [dbh] or ten inches aggregate dbh for multi-trunk trees) is removed, replanting will be with the same species at 1:1 ratio. To allow for access to the pipeline, replanted trees will not be located within 20 feet of the pipeline.
- All non-native protected trees which are removed will be replaced at a 1:1 ratio with a non-invasive or native tree species.
- All disturbed plant, bush, and ground cover landscaping will be restored to pre-project conditions, using similar plants and materials.

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**Impact 3.2-4: Construction of a pipe bridge may affect the visual character at San Pablo Creek (applies to Central Pressure Zone Pipeline [Richmond/San Pablo]).**

The Central Pressure Zone Pipeline (Richmond/San Pablo) would involve the construction of a pipe bridge across San Pablo Creek. Two routes are evaluated, the proposed alignment within an existing EBMUD utility corridor and an alternative alignment along San Pablo Avenue.

**Proposed Alignment Using EBMUD Utility Corridor.** As described in Section 3.2.1, Setting, above, in the vicinity of the proposed alignment, vegetation within and adjacent to the EBMUD utility corridor between Brookside Drive and Road 20 is thick, with a fully developed canopy. The preferred alignment is bordered by private property along Road 20 and is fenced along Brookside Drive, restricting public access to the area and making it difficult for the public to view the location of the proposed pipe bridge. It is expected that after construction, the remaining vegetation surrounding the utility corridor would screen the view of the area around the pipe bridge and in the long term the tree canopy would fill in to close any gap created by tree removal. Consequently, the pipeline would not be readily visible from adjacent residences and public viewpoints along Road 20, Brookside Drive and Kennedy Plaza and this impact would be *less than significant*.

**San Pablo Avenue Option.** Under the San Pablo Avenue Option, the pipe bridge would be placed across San Pablo Creek adjacent to San Pablo Avenue. As described in Chapter 2, *Project Description*, the elevation of the current San Pablo Avenue bridge is 52 feet[1] at the bridge deck and 45 feet at the bottom of the bridge. Under the San Pablo Avenue Option, the pipe bridge footings would be at elevation 50 feet, the pipe bridge deck would be at 52.5 feet and the top railing of the bridge would be at 57 feet (Figure 2-13). The deck of the proposed pipe bridge would be slightly higher (approximately six inches) than the deck of the existing San Pablo Avenue bridge, and approximately three feet higher than the pedestrian walkway along west side of the San Pablo Avenue bridge. The pipe bridge would be clearly visible from the San Pablo

[1] All elevations presented in North American Vertical Datum of 1988.

Avenue bridge and pedestrian walkway, as well as from the northeast corner of Kennedy Plaza and the parking lot adjacent to Road 20 and San Pablo Avenue. The pipe bridge would partially obstruct views of San Pablo Creek and the adjacent vegetated banks from these areas. The pipe bridge would also conflict with the City of San Pablo *General Plan 2030* Policy OSC-I-10, which requires maintenance, protection and enhancement of the aesthetic value of San Pablo Creek. Therefore, this would be a significant impact.

If the San Pablo Avenue Option is selected, the bridge may be developed as a combined pipe and pedestrian bridge to replace the existing pedestrian walkway of the San Pablo Avenue Bridge. The City of San Pablo is considering replacing the existing walkway to raise it to street level. Under this scenario, the pipeline could be constructed under a pedestrian walkway and would be less visible from surrounding public viewpoints. However, due to the uncertainty in coordinating these two projects, it is not clear that this option is feasible. As a result, the impact of this optional alignment is considered *significant and unavoidable*.

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**Impact 3.2-5: Aboveground appurtenances may affect visual character along the pipeline routes (applies to all pipelines).**

As described in Chapter 2, Project Description, and shown in Figure 2-10, the pipelines would include air valves at high points and certain sharp grade breaks. Air valves would have above-grade vents consisting of an air valve and associated piping, anchored on an approximately 2.5-foot by 1.5-foot concrete pad, and enclosed by an approximately 2-foot-wide by 1-foot-tall stainless steel mesh cage. Plastic pipeline markers (4-inches wide by 6-feet high) identifying appurtenances may be included above the pipelines where the Wildcat Pipeline (Berkeley) crosses the median at Parkside Drive and where the Central Pressure Zone Pipeline (Richmond/San Pablo) crosses San Pablo Creek in the EBMUD right-of-way. These appurtenances are typical of urban utilities and would not cause a noticeable change in the visual character of the area surrounding the pipelines, and therefore, this impact is considered *less than significant*.

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## References

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City of San Pablo. 2011. *San Pablo General Plan 2030*. April 2011. Available: < http://www.ci.san-pablo.ca.us/DocumentView.aspx?DID=669>. Accessed June 6, 2012.

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# 3.3 Air Quality

This section addresses the air quality impacts that could result from implementation of the proposed West of Hills Northern Pipelines Project, including increases in criteria air pollutants and health risks associated with toxic air contaminants. The principal air emissions generated by the proposed Project would be short term in nature, associated with the construction of Project facilities. Impacts specific to greenhouse gas (GHG) emissions and climate change are evaluated in Section 3.8, Greenhouse Gas Emissions.

## 3.3.1 Setting

### Meteorology

Climate and meteorology are important considerations for air quality. Local dispersion and regional transport of air pollutants directly relate to prevailing meteorology. Diurnal, seasonal, and regional air pollution patterns are controlled by a variety of meteorological factors. Wind directions and speeds and vertical temperature structure (inversions) are the primary determinants of transport and dispersion effects.

The project area is located on the east side of San Francisco Bay, opposite the Golden Gate, referred to as the East Bay. California's climate is considered to be a Mediterranean type climate. This climate type is characterized by moist mild winters and dry summers. As with the entire Bay Area, the East Bay climate is further influenced by the relatively cool waters of the Pacific Ocean on the west, which create summer temperatures that are 10 to 20 degrees Fahrenheit (°F) cooler than in inland valleys farther east.

Summertime in the Bay Area is characterized by cool marine air and persistent coastal stratus and fog, with average maximum temperatures between 60°F and 70°F, and minimum temperatures between 50°F and 55°F. Rainfall from May through September is relatively rare, with an aggregate of less than an inch, or only about 5 percent of the yearly average total precipitation of about 22 to 23 inches. Winter temperatures in the Bay Area are quite moderate, with highs between 55°F and 60°F and lows in the range of 45°F to 50°F.

Wind data for the Point San Pablo meteorological station located about 4-1/2 miles west of downtown Richmond indicate the prevailing direction is south southwesterly with over 50 percent of the winds coming from the south through southwest sector. The average wind speed at this station is 11 miles per hour.

### Ambient Air Quality

The Bay Area Air Quality Management District (BAAQMD) operates a regional monitoring network that measures the ambient concentrations of six criteria air pollutants: ozone, carbon monoxide (CO), particulate matter ($PM_{10}$ and $PM_{2.5}$), nitrogen dioxide ($NO_2$), and sulfur dioxide ($SO_2$). Existing and probable future air quality in the project area can best be inferred from examining ambient air quality measurements taken by the BAAQMD at its closest monitoring stations to the project area. **Table 3.3-1** presents local ambient air quality monitoring data for 2007 through 2011, and compares measured pollutant concentrations with the most stringent applicable state and federal ambient air quality standards. The monitoring data presented in Table 3.3-1 are primarily from the San Pablo monitoring station. Because the San Pablo monitoring station does not monitor all criteria pollutants, $PM_{2.5}$ data were obtained from the Concord station (although physically closer, data from Berkeley and Oakland were incomplete for $PM_{2.5}$).

**TABLE 3.3-1**
**LOCAL AIR QUALITY MONITORING SUMMARY (2007 – 2011)**

| Monitoring Station & Pollutant | Most Stringent Applicable Standard | Number of Days Standards were Exceeded and Maximum Concentrations Measured | | | | |
|---|---|---|---|---|---|---|
| | | 2007 | 2008 | 2009 | 2010 | 2011 |
| San Pablo Data (With Berkeley, Oakland, and Concord Data As Noted) | | | | | | |
| Ozone ($O_3$) | | | | | | |
| - Days 1-hour standard exceeded | >0.09 ppm[a] | 0 | 0 | 0 | 1 | 0 |
| - Maximum 1-hour (ppm) | | 0.07 | 0.08 | 0.04 | **0.10** | 0.08 |
| - Days 8-hour standard exceeded | >0.07 ppm[a] | 0 | 0 | 0 | 1 | 0 |
| - Maximum 8-hour (ppm) | | 0.05 | 0.06 | 0.04 | **0.08** | 0.06 |
| Nitrogen Dioxide ($NO_2$) | | | | | | |
| - Days 1-hour standard exceeded | | 0 | 0 | 0 | 0 | 0 |
| - Maximum 1-hour (ppm) | >0.18 ppm[a] | 0.05 | 0.07 | 0.04 | 0.05 | 0.05 |
| Carbon Monoxide (CO) | | | | | | |
| - Days 1-hour standard exceeded | >20 ppm[a] | 0 | 0 | 0 | 0 | 0 |
| - Maximum 1-hour (ppm) | | 2.4 | 2.5 | 1.5 | xx | xx |
| - Days 8-hour standard exceeded | >9 ppm[a] | 0 | 0 | 0 | 0 | 0 |
| - Maximum 8-hour (ppm) | | 1.2 | 1.3 | 0.8 | 0.9 | 1.0 |
| Suspended Particulates (PM10) | | | | | | |
| - Maximum 24-hour (μg/m$^3$) | >50 μg/m$^3$ [a,c] | **57** | 44 | 34 | 41 | **73** |
| - Estimated Days 24-hour standard exceeded | | 12 | 0 | 0 | 0 | 6 |
| Suspended Particulates ($PM_{2.5}$) | | | | | | |
| - Maximum 24-hour (μg/m$^3$) | >35 μg/m$^3$ [b] | **47** | **60** | **39** | **36** | **48** |
| - Days 24-hour standard exceeded | | 7 | 7 | 1 | 1 | 2 |
| - Annual average (μg/m$^3$) | >12 μg/m$^3$ [a] | 8.7 | 9.5 | 8.4 | 7.1 | 7.9 |

NOTES: **Bold** values are in excess of applicable standard, "NA" indicates that no data available, ppm = parts per million, μg/m$^3$ = micrograms per cubic meter

San Pablo Monitoring Station: Ozone, NO2, CO, PM-10
Concord Monitoring Station: PM-2.5
xx: data not reported on California Air Resources Board (CARB) site

[a] State standard, not to be exceeded.
[b] Federal standard, not to be exceeded.
[c] Since PM10 is only sampled every sixth day, actual days over the standard can be estimated to be six times the number shown.

SOURCE: BAAQMD, 2007 to 2011.

These annual average data indicate that the project area is currently subject to particulate levels $PM_{10}$ and $PM_{2.5}$) that exceeded the state $PM_{10}$ annual standard of 50 micrograms per cubic meter (µg/$m^3$) in 2007 and 2011 but not in the intervening years, and periodically exceeded the federal $PM_{2.5}$ standard of 35 µg/$m^3$ throughout this period. The annual average $PM_{2.5}$ levels did not exceed the state $PM_{2.5}$ annual standard of 12 µg/$m^3$ over the 5-year period. **Table 3.3-2** presents a summary of BAAQMD's attainment status with respect to federal and state standards. As indicated in Table 3.3-2, the San Francisco Bay Area Air Basin (SFBAAB) is designated as "nonattainment" for state $O_3$, $PM_{10}$, and $PM_{2.5}$ standards, while it is designated as "attainment" for all other criteria pollutants. With respect to federal standards, the Bay Area's attainment status for 8-hour ozone is classified as "marginal nonattainment" in Alameda and Contra Costa Counties, "nonattainment" for $PM_{2.5}$, and "unclassified" or "attainment" for all others.

### *Criteria Air Pollutants*

**Ozone ($O_3$).** Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxide ($NO_X$). The main sources of $NO_X$ and ROG, often referred to as ozone precursors, are combustion processes (including motor vehicle engines) and the evaporation of solvents, paints, and fuels. Automobiles are the single largest source of ozone precursors in the Bay Area. $O_3$ is a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema (BAAQMD, 2012a). Table 3.3-1 shows that exceedance of the state 1-hour standard occurred on 1 day between 2007 and 2011. The state 8-hour standard of 0.07 ppm was also exceeded once during this 5-year period, in 2010.

**Carbon Monoxide (CO).** CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles; the highest emissions occur during low travel speeds, stop-and-go driving, cold starts, and hard acceleration. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, dizziness, fatigue, unconsciousness, and even death (BAAQMD, 2012a). Table 3.3-1 shows that no exceedances of state CO standards were reported between 2007 and 2011. Maximum 8-hour CO levels average less than 12 percent of the allowable 8-hour standard.

**Suspended and Inhalable Particulate Matter ($PM_{10}$ and $PM_{2.5}$).** Particulate matter is a class of air pollutants that consists of solid and liquid airborne particles in an extremely small size range. Particulate matter is measured in two size ranges: $PM_{10}$ for particles less than 10 microns in diameter, and $PM_{2.5}$ for particles less than 2.5 microns in diameter. Motor vehicles generate about half of all Bay Area particulates through tailpipe emissions as well as brake pad and tire wear. Another large source of fine particulates is wood burning in fireplaces and stoves. Fine particulates small enough to be inhaled into the deepest parts of the human lung can cause adverse health effects. Extended exposure to particulate matter can increase the risk of chronic respiratory disease. $PM_{2.5}$ poses an increased health risk because the particles can deposit deep in the lungs and contain substances that are particularly harmful to human health (BAAQMD, 2012a).

**TABLE 3.3-2**
**STATE AND FEDERAL ATTAINMENT STATUS – SAN FRANCISCO BAY AREA AIR BASIN**

| Pollutant | Averaging Time | State Standards[a] | | Federal Standards[b] | |
|---|---|---|---|---|---|
| | | Concentration | Attainment Status | Concentration[c] | Attainment Status |
| Ozone | 1 hour | 0.09 ppm (180 μg/m$^3$) | N | N/A | – |
| | 8 hour | 0.07 ppm (137 μg/m$^3$) | N | 0.075 ppm | Marginal N[d] |
| Carbon Monoxide | 1 hour | 20 ppm (23 mg/m$^3$) | A | 35 ppm (40 mg/m$^3$) | A |
| | 8 hour | 9 ppm (10 mg/m$^3$) | A | 9 ppm (10 mg/m$^3$) | A |
| Nitrogen Dioxide | 1 hour | 0.18 ppm (339 μg/m$^3$) | A | 0.10 ppm (See footnote e) | U |
| | Annual arithmetic mean | 0.030 ppm (57 μg/m$^3$) | N/A | 0.053 ppm (100 μg/m$^3$) | A |
| Sulfur Dioxide[f] | 1 hour | 0.25 ppm (655 μg/m$^3$) | A | 0.075 ppm (196 μg/m$^3$) | A |
| | 24 hour | 0.04 ppm (105 μg/m$^3$) | A | 0.14 ppm (365 μg/m$^3$) | A |
| | Annual arithmetic mean | N/A | – | 0.03 ppm (80 μg/m$^3$) | A |
| Particulate Matter (PM10) | 24 hour | 50 μg/m$^3$ | N | 150 μg/m$^3$ | U |
| | Annual arithmetic mean | 20 μg/m$^3$ | N | N/A | – |
| Fine Particulate Matter (PM2.5) | 24 hour | N/A | – | 35 μg/m$^3$ (See footnote g) | N |
| | Annual arithmetic mean | 12 μg/m$^3$ | N[g] | 15 μg/m$^3$ | A |
| Sulfates | 24 hour | 25 μg/m$^3$ | A | N/A | – |
| Lead[h] | 30 day average | 1.5 μg/m$^3$ | – | N/A | A |
| | Calendar quarter | N/A | – | 1.5 μg/m$^3$ | A |
| | Rolling 3-month average[i] | N/A | – | 0.15 μg/m$^3$ | U/A |
| Hydrogen Sulfide | 1 hour | 0.03 ppm (0.15 μg/m$^3$) | U | N/A | – |
| Vinyl Chloride[h] | 24 hour | 0.01 ppm (26 μg/m$^3$) | – | N/A | – |

NOTES: A = attainment; N = nonattainment; U = unclassified; N/A = not applicable or no applicable standard; ppm = parts per million; μg/m$^3$ = micrograms per cubic meter; mg/m$^3$ = milligrams per cubic meter; – = not indicated or no information available.

[a] State ambient air quality standards (California). The state standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, and suspended particulate matter (PM10) are values that are not to be exceeded. All other state standards shown are values not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM10 annual standard), then some measurements may be excluded. In particular, measurements are excluded that the CARB determines would occur less than once per year on the average.

[b] National ambient air quality standards. National standards shown are the "primary standards" designed to protect public health. National standards, other than for ozone and particulates, and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the three-year average of the fourth highest daily concentration is 0.075 ppm (775 ppb) or less. The 24-hour PM10 standard is attained when the three-year average of the 99th percentile of monitored concentrations is less than 150 μg/m$^3$. The 24-hour PM2.5 standard is attained when the three-year average of 98th percentile is less than 35 μg/m$^3$.

[c] National air quality standards are set by U.S. EPA at levels determined to be protective of public health with an adequate margin of safety.

[d] On September 22, 2011, the U.S. EPA announced it would implement the current 8-hour ozone standard of 0.075 ppm. Initial area designations were issued on March 2012. Alameda and Contra Costa Counties were designated by the U.S. EPA as Marginal Nonattainment. Current designations available online at: http://www.epa.gov/oaqps001/greenbk/ancl.html.

[e] To attain this standard, the three-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).

**TABLE 3.3-2 (Continued)**
**STATE AND FEDERAL AMBIENT ATTAINMENT STATUS – SAN FRANCISCO BAY AREA AIR BASIN**

[f] On June 2, 2010, the U.S. EPA established a new 1-hour SO2 standard, effective August 23, 2010, which is based on the three-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030 ppm annual and 0.14 ppm 24-hour SO2 national standards must continue to be used, however, until one year following U.S. EPA initial designations of the new 1-hour SO2 national standard. As of July 2012, California was not included on the U.S. EPA's list of nonattainment or maintenance areas. Current designations available online at: http://www.epa.gov/oaqps001/greenbk/sindex.html).

[g] The U.S. EPA designated the SFBAAB as nonattainment of the PM2.5 standard on October 8, 2009. The effective date of the designation is December 14, 2009 and the BAAQMD has three years to develop a plan—called a State Implementation Plan (SIP)—that demonstrates the SFBAAB will achieve the revised standard by December 14, 2014. The SIP for the new PM2.5 standard must be submitted to the U.S. EPA by December 14, 2012.

[h] The CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure below which there are no adverse health effects determined.

[i] National lead standard, rolling 3-month average: final rule signed October 15, 2008. Final designations effective December 31, 2011.

SOURCE: BAAQMD (2012b)

Diesel exhaust is an important concern in the Bay Area and throughout California. The California Air Resources Board (CARB) identified diesel particulate matter (DPM) as a toxic air contaminant (TAC), and DPM has also been identified as a human carcinogen. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Many of these toxic compounds adhere to the diesel soot particles, which are very small and can penetrate deeply into the lungs. Several medical research studies have linked near-road pollution exposure to a variety of adverse health outcomes impacting children and adults, including significant allergic response and elevated production of specific antibodies (BAAQMD, 2012a).

Table 3.3-1 shows that the state $PM_{10}$ standard was exceeded an estimated 18 times during the last 5 years of data and they occurred in 2007 and 2011. The federal $PM_{10}$ standard of 150 µg/$m^3$ was not exceeded at the San Pablo monitoring station.

In 2006, the U.S. Environmental Protection Agency (EPA) reduced the standard for $PM_{2.5}$, which represents the fine fraction of particulate from 65 to 35 µg/$m^3$. Table 3.3-1 presents the $PM_{2.5}$ data from the Concord monitoring station for 2007 through 2011 ($PM_{2.5}$ is not monitored at the San Pablo station). The 35 µg/$m^3$ $PM_{2.5}$ standard has been exceeded on 18 measurement days during the last five years. $PM_{2.5}$ is typically monitored every third day, and therefore there could be 10 to 11 days per year when the federal $PM_{2.5}$ standard was exceeded. The state annual average $PM_{2.5}$ standard of 12 µg/$m^3$ was not exceeded during this 5-year period.

**Other Criteria Air Pollutants.** The standards for $NO_2$, $SO_2$, and lead are being met in the SFBAAB, and pollutant trends suggest that the air basin will continue to meet these standards for the foreseeable future.

## Toxic Air Contaminants

TACs are a defined set of airborne pollutants that may pose a present or potential hazard to human health. A wide range of sources, from industrial plants to motor vehicles, emit TACs. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis or genetic damage; or short-term acute affects such as eye watering, respiratory irritation (a cough), running nose, throat pain, and headaches (BAAQMD, 2012a).

TACs can be emitted directly and can also be formed in the atmosphere through reactions among different pollutants. The methods presented in the BAAQMD's CEQA Guidelines (2012a) for assessing local community risk and hazard impacts only include direct TAC emissions, not those formed in the atmosphere. The BAAQMD regulates TACs using a risk-based approach. For evaluation purposes, TACs are separated into carcinogens and non-carcinogens based on the nature of the physiological effects associated with exposure to the pollutant. Carcinogens are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per one million exposed individuals, typically over a lifetime of exposure. Non-carcinogenic substances differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis. Acute and chronic exposure to non-carcinogens is expressed as a hazard index (HI), which is the ratio of expected exposure levels to acceptable reference exposure levels (BAAQMD, 2012a).

### Sensitive Receptors

Land uses such as schools, children's day care centers, playgrounds, hospitals, rehabilitation centers, and senior housing (including assisted living and nursing homes) are considered to be more sensitive than the general public to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress. Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. Residential areas are considered more sensitive to air quality conditions than commercial and industrial areas, because people generally spend longer periods of time at their residences, and therefore have greater exposure to ambient air quality conditions in residential areas. Sensitive receptors located adjacent to the Project pipeline alignments are summarized in **Table 3.3-3**.

## 3.3.2 Regulatory Setting

### Ambient Air Quality Standards

The federal Clean Air Act Amendments of 1970 established national ambient air quality standards, and individual states retained the option to adopt more stringent standards and to include other pollution sources. California had already established its own air quality standards when federal standards were established, and because of the unique meteorological problems in the state, there is considerable diversity between state and federal ambient air quality standards currently in effect in California. These standards and current attainment status of the SFBAAB is shown in Table 3.3-2.

The ambient air quality standards are intended to protect the public health and welfare, and they incorporate an adequate margin of safety. They are designed to protect those segments of the public most susceptible to respiratory distress, known as sensitive receptors, including asthmatics,

**TABLE 3.3-3**
**SENSITIVE RECEPTORS NEAR THE PIPELINE ALIGNMENTS**

| Facility | Location | Distance from Alignment |
|---|---|---|
| **Wildcat Pipeline (Berkeley)** | | |
| Residential Uses | Entire Alignment Except Telegraph Ave. | Adjacent |
| Claremont Day Nursery | 2845 Woolsey Street | Adjacent |
| Willard Middle School | 2425 Stuart Street | Adjacent |
| The Academy | 2722 Benvenue Avenue | 275 feet |
| Alta Bates Hospital | 2450 Ashby Avenue | 500 feet |
| **Wildcat Pipeline (El Cerrito)** | | |
| Residential Uses | Entire Alignment | Adjacent |
| Windrush Elementary | 1800 Elm Street | Adjacent |
| RN3 Loving Care Homes | 917 Elm Street | 275 feet |
| Piccoli Preschool | 1532 Richmond Street | Adjacent |
| Keystone Montessori School | 6639 Blake Street | Adjacent |
| Harding Child Care and Park | 7115 C Street | Adjacent |
| Harding Elementary School | 7230 Fairmount Avenue | 200 feet |
| St. Jerome Elementary School | 320 San Carlos Avenue | >500 feet |
| El Cerrito High School | 540 Ashbury Avenue | >500 feet |
| Fairmont Elementary School | 724 Kearney Street | >500 feet |
| Fairmont Child Care | 715 Lexington Avenue | > 500 feet |
| Portola Middle School | 1021 Navellier Street | > 500 feet |
| Castro Elementary School | 7125 Donal Avenue | > 500 feet |
| **Central Pressure Zone Pipeline (El Cerrito/Richmond)** | | |
| Residential Uses (Scattered Residences and Various Residential Developments Including Eskaton Hazel Shirley Manor) | Generally North of Potrero Avenue, at or South of Lincoln Avenue, and Between Madison and Burlingame Aves. | Adjacent |
| St. John the Baptist School and Day Care | 11156 San Pablo Avenue | Adjacent |
| Fairmont Elementary School | 724 Kearney Street | 300 feet |
| Fairmont Child Care | 715 Lexington Avenue | 300 feet |
| **Central Pressure Zone Pipeline (Richmond/San Pablo)** | | |
| Residential Uses | Generally North of Costa Avenue | Adjacent |
| Richmond High School | 1250 23rd Street | Adjacent |
| NIAD Art Center | 551 23rd Street | Adjacent |
| Grant Elementary School | 2400 Downer Avenue | 220 feet |
| Vista Christian Elementary School | 2354 Andrade Avenue | 300 feet |
| Dover Elementary School | 1871 21st Street | >500 feet |
| St. Paul Elementary School | 1825 Church Lane | >500 feet |
| Ford Elementary School | 2711 Maricopa Avenue | >500 feet |
| Salesian High School | 2851 Salesian Avenue | >500 feet |
| Cesar Chavez Elementary School | 960 17th Street | >500 feet |

SOURCE: Orion Environmental Associates.

the very young, the elderly, people weak from other illness or disease, or persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels somewhat above the ambient air quality standards before adverse health effects are observed.

## Federal Regulations

The Clean Air Act requires that regional planning and air pollution control agencies prepare a regional Air Quality Plan to outline the measures by which both stationary and mobile sources of pollutants can be controlled in order to achieve all standards within the deadlines specified in the Clean Air Act. The BAAQMD is required to develop a State Implementation Plan (SIP) for any pollutant that exceeds the federal standards. The SIP must contain control strategies that demonstrate attainment with national ambient air quality standards by deadlines established in the federal Clean Air Act. For the Bay Area air basin, the Association of Bay Area Governments (ABAG), the Metropolitan Transportation Commission (MTC), and the BAAQMD jointly prepared a *Bay Area Air Quality Plan* in 1982, which predicted attainment of all federal Clean Air standards within the air basin by 1987. This forecast was somewhat optimistic in that attainment of federal Clean Air standards did not occur throughout the entire air basin until 1991.

The Bay Area Air Basin attainment status with respect to federal standards is summarized in Table 3.3-2. In general, the Bay Area experiences low concentrations of most pollutants when compared to federal standards, except for $O_3$ and particulate matter, for which standards are exceeded periodically. With respect to federal standards, the Bay Area's attainment status for 8-hour ozone is classified as "marginal nonattainment" in Alameda and Contra Costa Counties, and "nonattainment" for $PM_{2.5}$. As a designated "marginal" nonattainment area for the federal 8-hour ozone standard, preparation of a SIP is currently not required. However, in response to the EPA's designation of the overall basin for the 8-hour federal ozone standard, the BAAQMD, ABAG, and MTC were required to develop an ozone attainment plan to meet this standard. The *1999 Ozone Attainment Plan* was prepared and adopted by these agencies in June 1999, and this plan was updated in 2001. The most recent state ozone plan is the Bay Area *2010 Clean Air Plan.* The *2010 Clean Air Plan* was developed as a multi-pollutant plan that provides an integrated control strategy to reduce ozone, particulate matter (PM), toxic air contaminants, and greenhouse gases. In 1998, after many years without violations of any CO standards, the attainment status for CO was upgraded to "attainment."

## State Regulations

In 1988, California passed the California Clean Air Act (AB 2595) which, like its federal counterpart, called for designations of areas as attainment or non-attainment, based on state ambient air quality standards rather than federal standards. The Bay Area Air Basin attainment status with respect to state and federal standards is summarized in Table 3.3-2. In general, this table indicates the Bay Area experiences low concentrations of most pollutants when compared to state standards, except for ozone and particulate matter, for which standards are exceeded periodically.

CARB is the state agency responsible for regulating air quality. CARB responsibilities include establishing state Ambient Air Quality Standards, establishing emissions standards and regulations for mobile emissions sources (e.g., autos, trucks, etc.), and overseeing the efforts of county-wide and multi-county air pollution control districts, which have primary responsibility over stationary sources. The emission standards most relevant to the proposed Project are those related to automobiles, light- and medium-duty trucks, and heavy-duty truck engines.

In 2005, CARB approved a regulatory measure to reduce emissions of toxic and criteria pollutants by limiting the idling of new heavy-duty diesel vehicles, which altered five sections of Title 13 of the California Code of Regulations. The changes relevant to the proposed Project are in Section 2485, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling, which limit idling of a vehicle's primary diesel engine for greater than five minutes in any location (with some exceptions) or operation of a diesel-fueled auxiliary power system within 100 feet of residential areas.

## Local Policies

BAAQMD is the regional agency responsible for air quality regulation within the SFBAAB. BAAQMD regulates air quality through its planning and review activities. BAAQMD has permit authority over most types of stationary emission sources, can require stationary sources to obtain permits, and can impose emission limits, set fuel or material specifications, or establish operational limits to reduce air emissions. BAAQMD regulates new or expanding stationary sources of toxic air contaminants.

Because the region is designated non-attainment for both the 1- and 8-hour state ozone standards and emissions of ozone precursors in the SFBAAB contribute to air quality problems in neighboring air basins, state law requires the 2010 *Clean Air Plan* (CAP) to include all feasible measures to reduce emissions of ozone precursors and to reduce the transport of ozone precursors to neighboring air basins. The CAP addresses four categories of pollutants: ozone and ozone precursors (ROG and $NO_X$); particulate matter (primarily $PM_{2.5}$); air toxics; and GHGs. The CAP contains 55 control strategies that can be grouped into the following categories:

- 18 stationary source measures
- 10 mobile source measures
- 17 transportation control measures
- 6 land use and local impact measures
- 4 energy and climate measures

In response to Senate Bill (SB) 656, BAAQMD completed the *Particulate Matter Implementation Schedule* in November 2005. The implementation schedule evaluates the applicability of 103 PM control measures identified by CARB and discusses how applicable measures are implemented by BAAQMD. BAAQMD implements a number of regulations and programs to reduce PM emissions, such as controlling dust from earthmoving and construction/ demolition operations, limiting emissions from various combustion sources such as cement kilns and furnaces, and reducing PM emissions from composting and chipping activities. In addition to limiting stationary sources, BAAQMD implements a variety of mobile source incentive programs to encourage fleet operators and the public to purchase low-emission vehicles, re-power old polluting heavy-duty diesel engines, and install after market emissions control devices to reduce particulates and $NO_X$ emissions.

In June 2010, BAAQMD adopted CEQA significance thresholds and updated their previous CEQA Guidelines. These 2010 thresholds include quantitative CEQA significance thresholds for emissions of criteria pollutants, ozone precursors, and TACs during project construction and operations (BAAQMD, 2012a). However, subsequent litigation on the adopted thresholds resulted in a decision by the Alameda County Superior Court on March 5, 2012 that the BAAQMD failed to comply with CEQA when it adopted the thresholds. The court did not rule on the merits of the BAAQMD's thresholds but found that the adoption of the thresholds was a project under CEQA. The court issued a writ of mandate ordering the District to set aside the thresholds and cease dissemination of them until the Air District had complied with CEQA. These thresholds have since been removed from the BAAQMD's CEQA Guidelines. However, the technical analysis conducted by BAAQMD provides substantial evidence in the record (BAAQMD, 2009) to support the use of the BAAQMD thresholds adopted in 2010.

# 3.3.3 Impacts and Mitigation Measures

## Significance Criteria

For the purposes of this EIR and consistent with Appendix G of the CEQA Guidelines, the West of Hills Northern Pipelines Project is considered to have a significant impact on air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal, state, or regional ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people

Although BAAQMD's adoption of significance thresholds in 2010 and 2011 are the subject of recent judicial actions, Appendix D of the BAAQMD *CEQA Air Quality Guidelines,* in combination with the BAAQMD's *Revised Draft Options and Justification Report* (BAAQMD, 2009), provides substantial evidence to support the thresholds. Therefore, the following thresholds developed by BAAQMD for construction-related and operational criteria pollutant emissions have been applied in this analysis to determine whether the proposed Project's air pollutant emissions would significantly affect the SFBAAB's regional air quality (both at a project level and cumulatively):

- 54 pounds/day $NO_X$ and ROG
- 82 pounds/day PM10
- 54 pounds/day PM2.5

In addition to establishing the above significance thresholds for criteria pollutant emissions, BAAQMD also recommended (BAAQMD, 2009) the following quantitative thresholds to determine the significance of construction-related and operational emissions of toxic air contaminants from individual project and cumulative sources on cancer and non-cancer health risks:

- Increased cancer risk of >10.0 in a million for individual projects and >100 in a million (from all local sources) for cumulative sources
- Increased non-cancer risk of >1.0 Hazard Index (Chronic or Acute) for individual projects and >10.0 Hazard Index (from all local sources) for cumulative sources
- Ambient $PM_{2.5}$ increase: >0.3 $\mu g/m^3$ annual average for individual projects and >0.8 $\mu g/m^3$ annual average (from all local sources) for cumulative sources

These BAAQMD-recommended thresholds have also been applied in this analysis.

## Approach to Analysis

### *Methodology*

This air quality impact analysis considers construction and operational impacts associated with the proposed Project. Construction equipment, trucks, worker vehicles, and ground-disturbing activities associated with proposed pipelines would generate emissions of criteria air pollutants and precursors. Construction-related and operational emissions are evaluated consistent with methodologies outlined in the 2011 BAAQMD CEQA Guidelines for assessing and mitigating air quality impacts (BAAQMD, 2012a), including quantification of the Project's construction-related exhaust emissions and comparison to the daily criteria pollutant emissions significance thresholds in order to determine the significance of a Project's impact on regional air quality. Results of this analysis are presented below.

Consistent with the BAAQMD CEQA Guidelines, this analysis assumes potential health risk and hazard impacts could occur at sensitive receptors located within 1,000 feet of emission sources. Thus, human health risks and hazards associated with project construction are calculated at the Maximally-Exposed Individual (MEI) within the 1,000-foot zone of influence of each Project pipeline alignment. This analysis evaluates risk and hazard impacts on MEI due to the proposed Project's construction-related TAC emissions, primarily as DPM in combination with other existing major sources of DPM, such as freeways. Emissions from other projects within 1,000 feet of the project site, which could be under construction at the same time as the proposed Project, are considered in the cumulative impact analysis (see Section 5.0).

The BAAQMD CEQA Guidelines also provide significance thresholds for criteria pollutant and precursor emissions associated with Project operations. Since operation and maintenance of Project pipelines would only involve minor increases from existing practices in pickup trucks or vans for small crews conducting periodic inspections and occasional testing (larger vehicles would only be required if repairs or testing are done), operational air quality emissions and risk and hazard impacts would be minimal (less than significant), and quantification of air emissions associated with such minor increases in traffic is not provided.

## Impacts and Mitigation Measures

**Impact 3.3-1: Activities associated with proposed construction would generate significant, short-term increases in criteria pollutant emissions, including suspended and inhalable particulate matter and equipment exhaust emissions (applies to all pipelines).**

Typical project construction would involve cutting the pavement, excavating the trench, removing/stockpiling the soils, installing the pipe, backfilling the trench, and repaving. Emissions from the Project's construction equipment and vehicles would be generated from multiple sources, including heavy mobile equipment and delivery/haul trucks, and worker vehicles, progressing at a rate of 200 feet per day.[1]

Construction-related criteria pollutant emissions were calculated for the Project using the BAAQMD-recommended RoadMod (Roadway Construction Emissions Model Version 6.3.2), which is recommended for use in estimating emissions associated with linear projects. Maximum average daily emissions that would be associated with project construction for each Project element are summarized in **Table 3.3-4**. These emissions represent the construction day with activities that would generate the highest pollutant emissions for each pipeline, or in other words, the worst-case scenario for air pollutant emissions.

Whether or not a project's emissions exceed the BAAQMD significance thresholds, the BAAQMD recommends that all projects implement the *Basic Construction Mitigation Measures*, which is included as Mitigation Measure AIR-1a.

As indicated in Table 3.3-4, construction of either of the Wildcat Pipelines in Berkeley and El Cerrito would not exceed BAAQMD significance thresholds for criteria pollutants if only a single heading occurs during construction of these two pipelines. However, if construction of the Wildcat (Berkeley) and Wildcat (El Cerrito) pipelines were to occur at the same time, the combined $NO_X$ emissions would exceed the BAAQMD $NO_X$ threshold (Table 3.3-4), a potentially significant impact. Implementation of average fleet emissions as indicated in Mitigation Measure AIR-1b (i.e. use of on-road truck fleet averaging 2010 or newer) would be required to reduce the combined Project $NO_X$ emissions to a *less-than-significant* level.

[1] To estimate the project's construction-related emissions, each project segment was modeled for two construction progress rates: 80 feet per day and 200 feet per day. While the overall construction duration for the 80 feet per day scenario would be longer than for the 200 feet per day scenario, daily emissions associated with a construction rate of 80 feet per day would be up to 38 percent less for the Wildcat Pipelines (Berkeley and El Cerrito) and up to 32 percent less for the Central Pressure Zone Pipelines (El Cerrito, Richmond, and San Pablo) due to less excavation, construction and trucking on a daily basis.

**TABLE 3.3-4**
**CONSTRUCTION ACTIVITY CRITERIA POLLUTANT DAILY EMISSIONS**
**(pounds per day)**

| Construction Year and Scenario | ROG | CO | $NO_X$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|
| Mid-2015 to Mid-2017 | | | | | |
| Wildcat Pipeline (Berkeley) | 5.9 | 19.0 | 35.5 | 11.4 | 3.3 |
| Wildcat Pipeline (Berkeley) – with Mitigation Measure AIR-1b | 3.2 | 19.2 | 20.3 | 11.4 | 3.3 |
| Mid-2015 to Mid-2017 | | | | | |
| Wildcat Pipeline (El Cerrito) | 5.4 | 18.7 | 32.2 | 11.4 | 3.3 |
| Wildcat Pipeline (El Cerrito) – with Mitigation Measure AIR-1b | 3.3 | 18.9 | 19.9 | 11.4 | 3.3 |
| *Combined Emissions (Overlapping Construction – Two Headings)* | *11.2* | *37.7* | ***67.7*** | *22.8* | *6.6* |
| *Combined Emissions (Overlapping Construction) – With Mitigation Measure AIR-1b* | *6.5* | *38.1* | *40.2* | *22.8* | *6.6* |
| 2021 to 2022 | | | | | |
| Central Pressure Zone Pipeline (El Cerrito/Richmond) | 2.0 | 15.7 | 15.4 | 10.8 | 2.9 |
| 2021 to 2022 | | | | | |
| Central Pressure Zone Pipeline (Richmond/San Pablo) | 2.1 | 15.9 | 16.8 | 10.9 | 2.8 |
| – Jack-and-Bore Construction | 1.2 | 8.9 | 7.8 | 1.4 | 0.5 |
| – Bridge Crossing Construction | 1.1 | 7.2 | 8.8 | 1.4 | 0.5 |
| *Combined Emissions (Overlapping Construction – Two Headings and Two Creek Crossings)* | *6.4* | *47.7* | *48.8* | *24.5* | *6.7* |
| Previously-Recommended BAAQMD CEQA Significance Thresholds | 54 | - | 54 | 82 | 54 |

NOTES: **Bold** values indicate that the BAAQMD significance threshold is exceeded.
Based on production rate of 200 feet per day.

SOURCE: RoadMod computer model (Appendix F), Orion Environmental Associates.

Construction-related emissions in 2021-2022 for the Central Pressure Zone Pipelines in El Cerrito/Richmond and Richmond/San Pablo would be lower than 2015-2017 emissions associated with the Wildcat Pipelines in Berkeley and El Cerrito because of projected reductions in truck emissions per CARB regulatory requirements between 2015 and 2021. As indicated in Table 3.3-4, construction of the Central Pressure Zone Pipelines in El Cerrito/Richmond and Richmond/San Pablo would not exceed BAAQMD significance thresholds for criteria pollutants if construction of both pipelines (two headings) were to occur at the same time. In addition, if construction of both creek crossings were to overlap with pipeline construction (two headings), combined emissions would not exceed the BAAQMD significance thresholds for criteria pollutants, a *less-than-significant* impact. Alternatively, up to three pipeline construction headings could proceed concurrently without exceeding the significance thresholds for criteria pollutants.

**Mitigation Measure AIR-1a: Construction Mitigation Measures.**

To limit the Project's construction-related dust and criteria pollutant emissions, the following BAAQMD-recommended *Basic Construction Mitigation Measures* will be included in the contractor specifications for the proposed Project:

- When moisture content is low enough to create dust, all exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) will be watered two times per day or as needed to control dust. Areas may be rocked to minimize dust and water, covered, or spayed with soil binder.
- All haul trucks transporting soil, sand, or other loose material off-site will be covered.
- All visible mud or dirt track-out onto adjacent public roads will be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads will be limited to 15 miles per hour.
- All roadways, driveways, and sidewalks to be paved will be completed as soon as possible.
- Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage will be provided for construction workers at all access points.
- All construction equipment will be maintained and properly tuned in accordance with manufacturer's specifications. All equipment will be checked by a certified mechanic and determined to be running in proper condition prior to using the equipment at the construction site.
- A publicly visible sign with the telephone number and email address to contact EBMUD regarding dust complaints will be posted at the site. If dust exceeds specified limits, EBMUD would respond and take corrective action within 48 hours.

**Mitigation Measure AIR-1b: $NO_x$ Control.**

To reduce the Project's construction-related NOX, if construction of the Wildcat (Berkeley) and Wildcat (El Cerrito) pipelines occurs at the same time, or if two pipeline construction headings are undertaken on either the Wildcat (Berkeley) or Wildcat (El Cerrito) pipelines, the Project's on-road haul truck fleet will be, on average, model year of 2010 or newer.

**Impact Significance After Mitigation:** Less than significant.

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**Impact 3.3-2: Project construction could expose sensitive receptors to substantial pollutant concentrations (applies to all pipelines).**

Project construction would utilize diesel-powered equipment such as excavators, dozers, loaders, backhoes, and cranes. Operation of such equipment would generate emissions of TACs, including DPM and $PM_{2.5}$.

Because there are sensitive receptors located less than 100 feet from the project site, there is the potential for the Project's construction-related DPM emissions to exceed the BAAQMD's risk and hazard significance thresholds of 10 excess cancer cases in a million, a HI of 1 for chronic and acute non-cancer risks, and an annual $PM_{2.5}$concentration of 0.3 µg/m3. Therefore, a screening-level individual cancer analysis was conducted to determine the maximum inhalation cancer risk from Project-related construction activities at the closest sensitive receptor. The EPA AERSCREEN air dispersion model was used to evaluate concentrations of DPM and $PM_{2.5}$ from diesel exhaust. AERSCREEN is a single source Gaussian plume model which provides a maximum 1-hour ground-level pollution concentration estimate.

Since pipeline construction would progress along pipeline alignments at a rate of up to 200 feet per day, the only areas where equipment would operate for any length of time at one location would be at creek crossings and tie-in locations. The Central Pressure Zone Pipeline (Richmond/San Pablo) jack-and-bore crossing over Wildcat Creek (10 weeks) and the bridge crossing over San Pablo Creek (just under 4 weeks) are as close as approximately 750 feet apart. Therefore, the maximally exposed residences selected for analysis are the homes closest to the jacking pits as well as to 23rd Street but still within 1,000 feet of the bridge crossing, as shown in **Figure 3.3-1**, and these residents are considered to be the maximally exposed individuals (MEI) for the Project. Under worst-case conditions, the construction activities at this MEI could be as long as approximately two months (one month for bridge crossing and one month for jack and bore). Construction activities at each tie-in location could be as long as 2 ½ weeks. However, since tie-ins would be at the ends of Project pipelines, the MEI would be different for each tie-in location and exposure at these locations would therefore be relatively less than the MEI at the creek crossings.

Construction activities at both pipeline creek crossings are estimated to generate 0.0236 tons of $PM_{2.5}$ exhaust during 2021 (see RoadMod model output in Appendix F). With this emissions rate input into AERSCREEN, the predicted maximum one-hour DPM concentration is 0.0054 pounds per hour.[2] The AERSCREEN output indicates that project construction would produce a maximum annual DPM concentration of 0.1348 µg/m$^3$, which would be less than the individual Project $PM_{2.5}$ significance threshold of 0.3 µg/m$^3$. Actual emissions would be spread out over the two project sites, resulting in concentrations that would be even lower than this estimate. Similarly, emissions at each tie-in location would be less.

2 To evaluate the most conservative (worst-case) condition, emissions from both the jack-and-bore site and the bridge crossing site were modeled as a single site area (the size of the jack-and-bore site) because modeling each site separately would spread emissions over a larger area.

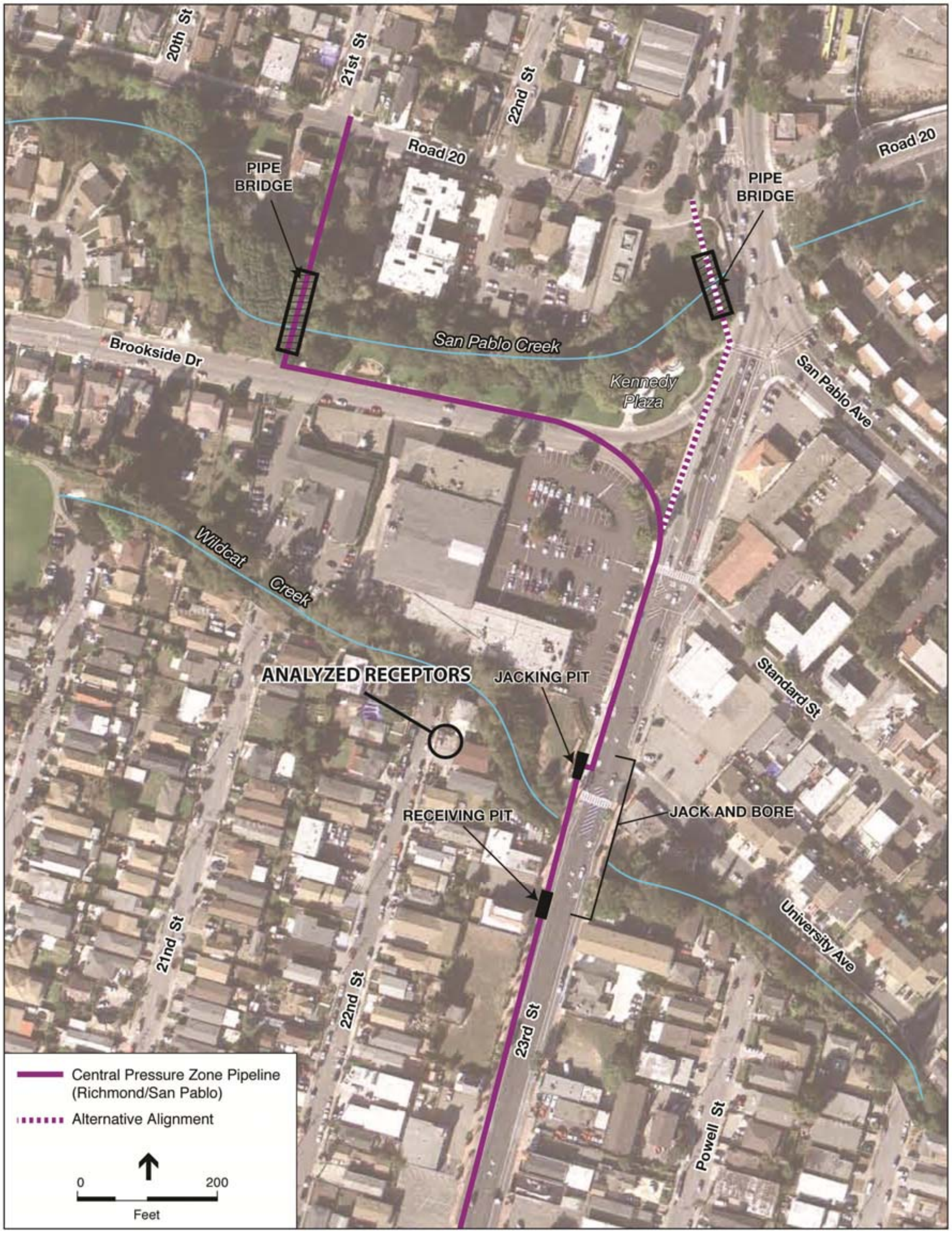


**Figure 3.3-1**
Location of Maximally Exposed Individuals Considered in Health Risk Screening

The excess individual cancer risk factor for DPM exposure is approximately 300 in a million per 1 μg/m$^3$ of lifetime exposure. More recent research has determined that young children are substantially more sensitive to DPM exposure risk. If exposure occurs in the first several years of life, an age sensitivity factor (ASF) of 10 should be applied. For toddlers though mid-teens, the ASF is 3. The DPM exposure risk from construction exhaust thus depends upon the age of the receptor population. However, even with the application of ASFs, the exposure risk to off-site residences would below the BAAQMD's 2010 cancer risk thresholds listed as follows:

| Age[3] (Years) | Excess Cancer Risk[4] | BAAQMD Threshold |
|---|---|---|
| 0-2 | 5.76 in a million | 10 in a million |
| 3-15 | 1.73 in a million | 10 in a million |
| >15 | 0.58 in a million | 10 in a million |

Thus, the maximum individual cancer risk would be well below the 10 in a million significance threshold for all age groups.

BAAQMD CEQA Guidelines require a determination of cumulative TAC impacts. Therefore, in addition to project construction, possible local stationary or vehicular source emissions must be added to this concentration to determine the cumulative total. Specifically, the guidelines require that existing stationary and mobile emissions sources within 1,000 feet of the project area also be considered. Any potential cumulative health risk would, therefore, derive from Project activities plus any existing identified risk sources within the project vicinity.

The BAAQMD has developed a Google Earth application that maps the locations of all stationary sources in the region that the BAAQMD permits. For each source, the application lists the name of the source and the conservative screening level cancer risk and $PM_{2.5}$ concentration values. For this Project, the only permitted sources within 1,000 feet of the project site are listed below. These numbers are added to the cumulative assessment for this Project.

| Distance from Project | Source | Address | Risk | Hazard Index | $PM_{2.5}$ |
|---|---|---|---|---|---|
| 450 feet | CCS Autobody | 1960 23rd St | 0.00 | 0.001 | 0 |
| 940 feet | Ventura's Body Shop | 2013 23rd St | 0.00 | 0.00 | 0 |
| | | Total | 0.00 | 0.001 | 0 |

The BAAQMD has also developed screening tables for roadways within 1,000 feet of a project based on annual average daily traffic (ADT). Only roadways with more than an ADT of 10,000 are to be included in the cumulative evaluation; in the project area, these are 23rd Street and San Pablo Boulevard.

According to BAAQMD information, for Contra Costa County the background $PM_{2.5}$ concentration from 23rd Street in the vicinity of the pipeline creek crossings at a setback distance of 140 feet from the MEI is 0.066 μg/m$^3$. The lifetime cancer risk from this roadway is 1.77 cases per million.

3 Age at start of construction.

4 Based on DPM (μg/m$^3$) * 300 x $10^{-6}$ x ASF / 70 years

For San Pablo Avenue in this same vicinity at a distance of 725 feet from the MEI, the background $PM_{2.5}$ concentration at this distance is 0.015 $\mu g/m^3$ and the lifetime cancer risk is 0.4 cases per million.

The BAAQMD has highway links for $PM_{2.5}$ cancer risk and hazard based on the highway's distance from the project. However, there are no highways within 1,000 feet of this site.

Results of the Project and cumulative health risk analysis are presented in **Table 3.3-5**. The Project's annual average $PM_{2.5}$ emissions, cancer and non-cancer risks are listed in this table, as well as the above-described cumulative stationary sources and major roadways within 1,000 feet of the Project.

**TABLE 3.3-5**
**HEALTH RISK ANALYSIS OF EXISTING SOURCES WITHIN 1,000 FEET OF THE PROJECT AREA**

| Type | Source | Risk (x $10^{-6}$) | $PM_{2.5}$ Concentration $\mu g/m^3$ | Hazard Index |
|---|---|---|---|---|
| Stationary Source | CCS Autobody | 0.00 | 0 | 0.001 |
| Stationary Source | Ventura's Body Shop | 0.00 | 0 | 0.00 |
| Major Roadway | 23rd Street | 1.77 | 0.066 | <0.020 |
| Major Roadway | San Pablo Avenue | 0.40 | 0.015 | <0.020 |
| | Total All Sources | 2.17 | 0.081 | <0.040 |
| | Individual Project (worst-case) | 5.76 | 0.135 | 0.027 |
| | Max Cumulative | 7.93 | 0.216 | <0.067 |
| | Threshold | 100 | 0.8 | 1 |

NOTES: na = not applicable

$PM_{2.5}$ = annual average ($\mu g/m^3$) concentration, cumulative threshold = 0.8 μg/m3
Risk = excess cancer risk per million, cumulative significance threshold = 100 in a million
Chronic Hazard Index = significance threshold = 1.0

SOURCE: BAAQMD, 2012c

The Project's construction-related DPM emissions would be well below BAAQMD individual and cumulative thresholds of significance, and therefore, the Project's health risks from DPM would be *less than significant* and its contribution to cumulative health risks at the MEI from stationary and major roadway sources in the vicinity would be less than cumulatively considerable.

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**Impact 3.3-3: Project construction activities would not create objectionable odors affecting a substantial number of people (applies to all pipelines).**

During project construction, nuisance diesel odors associated with operation of construction equipment could occur at adjacent uses. However, this effect would be localized, primarily affecting the closest residences, and would be occasional and temporary in nature. Due to the temporary nature of project construction, this impact would be *less than significant.*

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**Impact 3.3-4: Project operations would not violate air quality standards or contribute substantially to an existing air quality violation, expose sensitive receptors to substantial pollutant concentrations, or create objectionable odors (applies to all pipelines).**

Once the proposed pipelines are completed, they would be operated in the same manner as existing adjacent pipelines are currently operated. Therefore, following completion of Project pipelines, existing operational and maintenance practices for pipelines in project vicinities would remain the same, which would include regularly scheduled maintenance of Project pipelines. Criteria pollutant emissions associated with this maintenance traffic would remain similar to those associated with existing maintenance practices. Project pipelines would not be a source of TACs or $PM_{2.5}$ emissions, and therefore, there would be no operational risk and hazard impacts associated with operation of the Project. Odors would not be emitted during operation of proposed pipelines because of the potable water contained in the pipelines as well as the enclosed nature of Project facilities. Therefore, operational air quality emissions would be *less than significant*.

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# 3.4 Biological Resources

This section describes the existing biological resources in and near the project site; identifies the federal, State, and local regulations pertaining to biological resources; evaluates Project-related impacts on those resources; and identifies mitigation measures.

## 3.4.1 Setting

### Definitions

#### *Special-Status Species*

A number of species known to occur in the project vicinity are protected pursuant to federal and/or state endangered species laws, or have been designated Species of Special Concern by the California Department of Fish and Wildlife (CDFW). In addition, Section 15380(b) of the California Environmental Quality Act *CEQA Guidelines* provides a definition of rare, endangered or threatened species that are not included in any listing.[1] Species recognized under these terms are collectively referred to as "special-status species." For the purposes of this analysis, special-status species include:

- Plant and wildlife species listed as rare, threatened or endangered under the federal or state endangered species acts;
- Species that are candidates for listing under either federal or state law;
- Species formerly designated by the USFWS as Species of Concern or by CDFW as Species of Special Concern;
- Species protected by the federal Migratory Bird Treaty Act (16 U.S.C. 703-711) and the California Fish and Game Code; and
- Species such as candidate species that may be considered rare or endangered pursuant to Section 15380(b) of the CEQA *Guidelines*.

In addition, the CNPS list of Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties (Lake, 2010) list was consulted for plant species that may meet CEQA criteria as locally significant resources.

#### *Sensitive Biological Communities*

Sensitive biological communities are defined as those communities that are given special protection under CEQA and other applicable federal, state, and local laws, regulations and ordinances. Applicable laws and ordinances are discussed in Section 3.4.2.

[1] For example, vascular plants listed as rare or endangered or as List 1 or 2 by CNPS are considered to meet Section 15380(b).

## Information Sources and Survey Methodology

### *Literature Review*

#### Biological Communities

Prior to the site visit, the Alameda and Contra Costa County soil surveys (U.S. Dept. Agriculture, 1977; 1980) were examined to determine if any unique soil types (e.g., soils formed over limestone, serpentine, gabbro) that could support sensitive plant communities and/or aquatic features were present in the project site.

#### Special-status Species

The potential for special-status species to occur in the project area was evaluated by first determining which special-status species occur in the project vicinity through a literature and database search. Database searches for known occurrences of special-status species focused on occurrences within the three US Geologic Survey 7.5-minute quadrangles encompassing the project site; these are Oakland East, Oakland West, and Richmond. The following sources were reviewed to determine which special-status plant and wildlife species have been documented to occur in the project vicinity:

- California Natural Diversity Database records (CNDDB) (CDFG, 2012a)
- Special Vascular Plants, Bryophytes, and Lichens List (CDFG, 2012b)
- Special Animals List (CDFG, 2011)
- United States Fish and Wildlife Service (USFWS) quadrangle species list for Oakland East, Oakland West, Briones Valley, and Richmond quads (USFWS, 2012)
- California Native Plant Society (CNPS) Electronic Inventory records (CNPS, 2012)
- California Consortium of Herbaria (CCH, 2012)

### *Field Surveys*

On March 7 and 8, and June 19, 2012, the proposed pipeline alignments were visited to determine 1) plant communities and wildlife habitat present within the project site; 2) if existing conditions provided suitable habitat for any special-status plant or wildlife species; and 3) if sensitive habitats are present.

For the purposes of biological resources, the survey area was defined as the proposed work area plus the visible portions of adjacent parcels. Most of the pipeline alignments are located within roads, so the survey area included the road plus the front yards, sidewalks and parking strip landscaping, and parking areas visible from the road.

#### Biological Communities

To the extent practical, biological communities present in the project site were classified based on plant community descriptions in *A Manual of California Vegetation* (Sawyer et al., 2009) and/or *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer, 1988). However, because of high levels of disturbance and urbanization it was necessary to identify variants of community types. Biological communities were classified as sensitive or non-sensitive as defined by CEQA and other applicable laws and regulations. The proposed pipeline alignments were evaluated for the presence of sensitive biological communities, including riparian areas and sensitive natural communities recognized by the CDFW.

#### Wetlands and Waters

The proposed pipeline alignments were surveyed to determine if any wetlands and waters potentially subject to jurisdiction by the U.S. Army Corps of Engineers (USACE), the San Francisco Bay Regional Water Quality Control Board (RWQCB), or the CDFW were present. The assessment was based primarily on the presence of wetland indicator plants and any observed indicators of wetland hydrology or wetland soils. The preliminary waters assessment was based primarily on the presence of unvegetated, ponded areas or flowing water, or evidence indicating their presence such as a high water mark or a defined drainage course.

#### Special-status Species

The project area was surveyed to search for suitable habitats for special-status species identified in the literature review as potentially occurring in the vicinity. The potential for each special-status species to occur in the project site was then evaluated according to the following criteria:

- ***No Potential.*** Habitat on and adjacent to the project site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).
- ***Low Potential.*** Few of the habitat components meeting the species requirements are present, and/or most of the habitat on and adjacent to the project site is unsuitable or of very poor quality. The species is not likely to be found on the site.
- ***Moderate Potential.*** Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the project site is unsuitable. The species has a moderate probability of being found on the site.
- ***High Potential.*** All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the project site is highly suitable. The species has a high probability of being found on the site.
- ***Present.*** Species is observed on the project site or has been recorded (i.e., CNDDB, other reports) on the project site recently.

## Existing Site Conditions

### *Regional Setting*

The project area is located on the gently-sloping alluvial plain adjacent to the San Francisco Bay, from Berkeley to Richmond. Most of the project area is less than 100 feet in elevation, although the Wildcat Pipeline (Berkeley) segment rises to about 300 feet. The project area as a whole is highly urbanized. Small coastal creeks drain the region, but most have been placed in culverts underground. The only surface features within the project area are San Pablo Creek, a permanent stream with a watershed of 43 square miles, located at the northern end of the project area; and Wildcat Creek, a seasonal stream with a watershed of 10.7 square miles, also located at the northern end of the project area. The proposed alignments cross several other creeks which are underground within the project area. See Section 3.10 Hydrology and Water Quality, for a more detailed discussion of the watersheds and creeks in the project area.

### *Soils*

The soils in the project area range from Tierra loam (deep, moderately well-drained soils on dissected terraces and terrace remnants) to Clear Lake clay (poorly drained basin soils formed in fine-textured alluvium) (U.S. Dept. Agriculture, 1977 and 1980). None of the soils found in the project area have unusual composition or chemistry indicative of habitat for special-status plants.

### *Habitats*

Two terrestrial habitat types (urban and riparian) can be found within the project area; the entire alignment is urban habitat except for two creek crossings. **Figures 3.4-1** through **3.4-3** show the distribution of these habitat types. **Appendix G** presents a list of plant species observed.

#### Urban

Areas classified as urban comprise the vast majority of terrestrial habitat within the project area. These areas include those that are developed, with buildings and pavement present, and landscaped areas. Also contained within the urban matrix are vacant lots, too small to map at the scale of the project maps. Such lots support weedy plants such as broadleaf filaree (*Erodium botrys*), ribwort (*Plantago lanceolata*), cudweed (*Pseudognaphalium* sp.), fennel (*Foeniculum vulgare*), and bristly ox-tongue (*Helminthotheca* [= *Picris*] *echioides*). Few native plant species are present in urban habitats. For the most part, the ornamental trees and shrubs are relatively small in stature and therefore provide limited food and cover for wildlife.

In addition to areas dominated by buildings, the urban habitat type also includes small and isolated landscaped areas such as Parkside Park along the Wildcat Pipeline (Berkeley) and the park at Kennedy Plaza along the Central Pressure Zone Pipeline (Richmond/San Pablo). These areas tend to have larger trees but intensively maintained understory. Developed and landscaped areas provide limited wildlife habitat and typically support generalist[2] and often non-native wildlife species that are tolerant of human presence and activities, such as English sparrow (*Passer domesticus*), domestic pigeon (*Columba livia*), European starling (*Sternus vulgaris*), house finch (*Carpodacus mexicanus*), brown towhee (*Melozone [=Pipilo] crissalis*), Anna's hummingbird (*Calypte anna*), Norway rat (*Rattus norvegicus*), and house mouse (*Mus musculus*). Species observed during reconnaissance surveys include domestic pigeon, common crow (*Corvus brachyrhynchos*), California towhee, and house finch. Urban areas may also support several special-status bat species if abandoned or underutilized structures are present.

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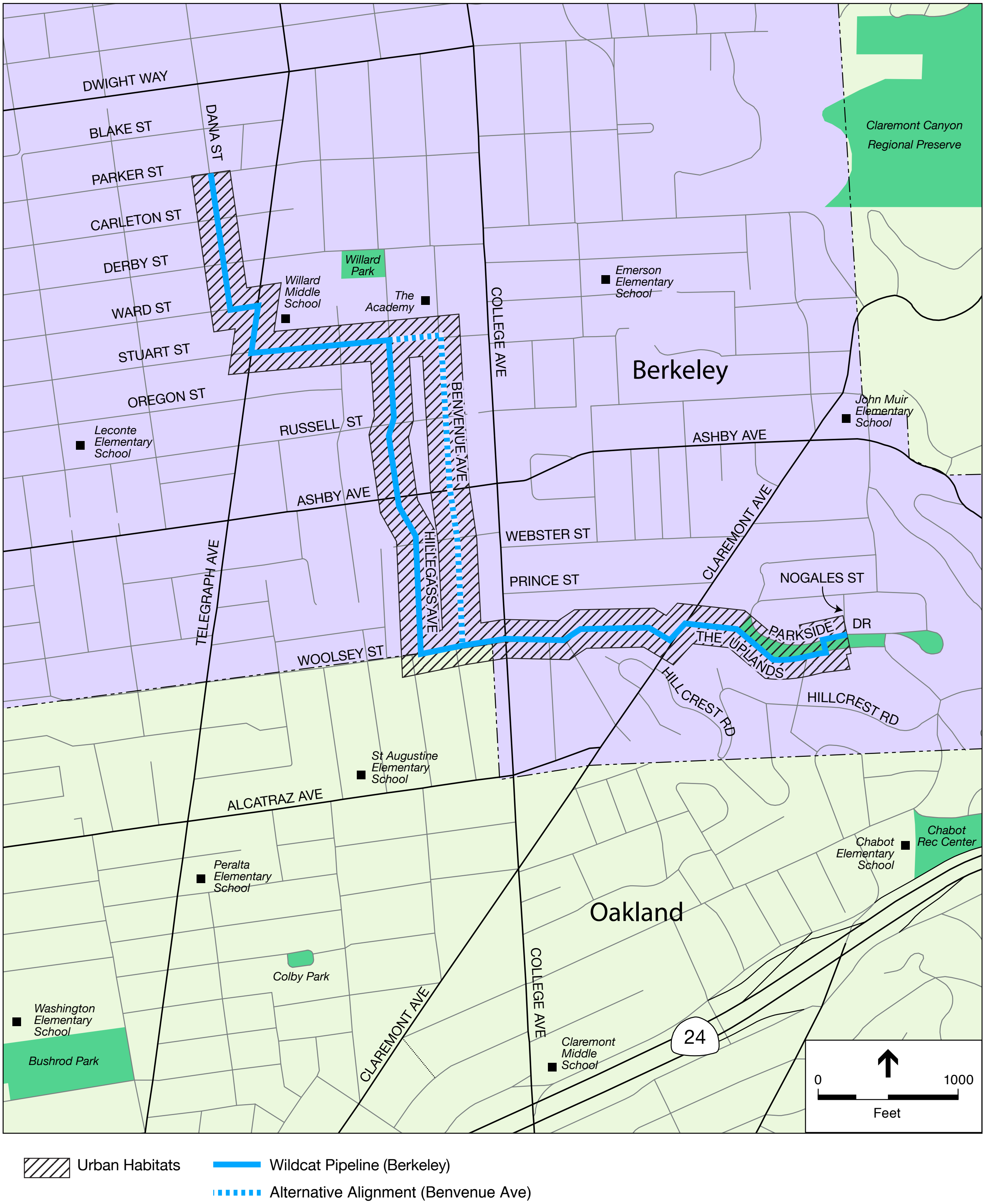
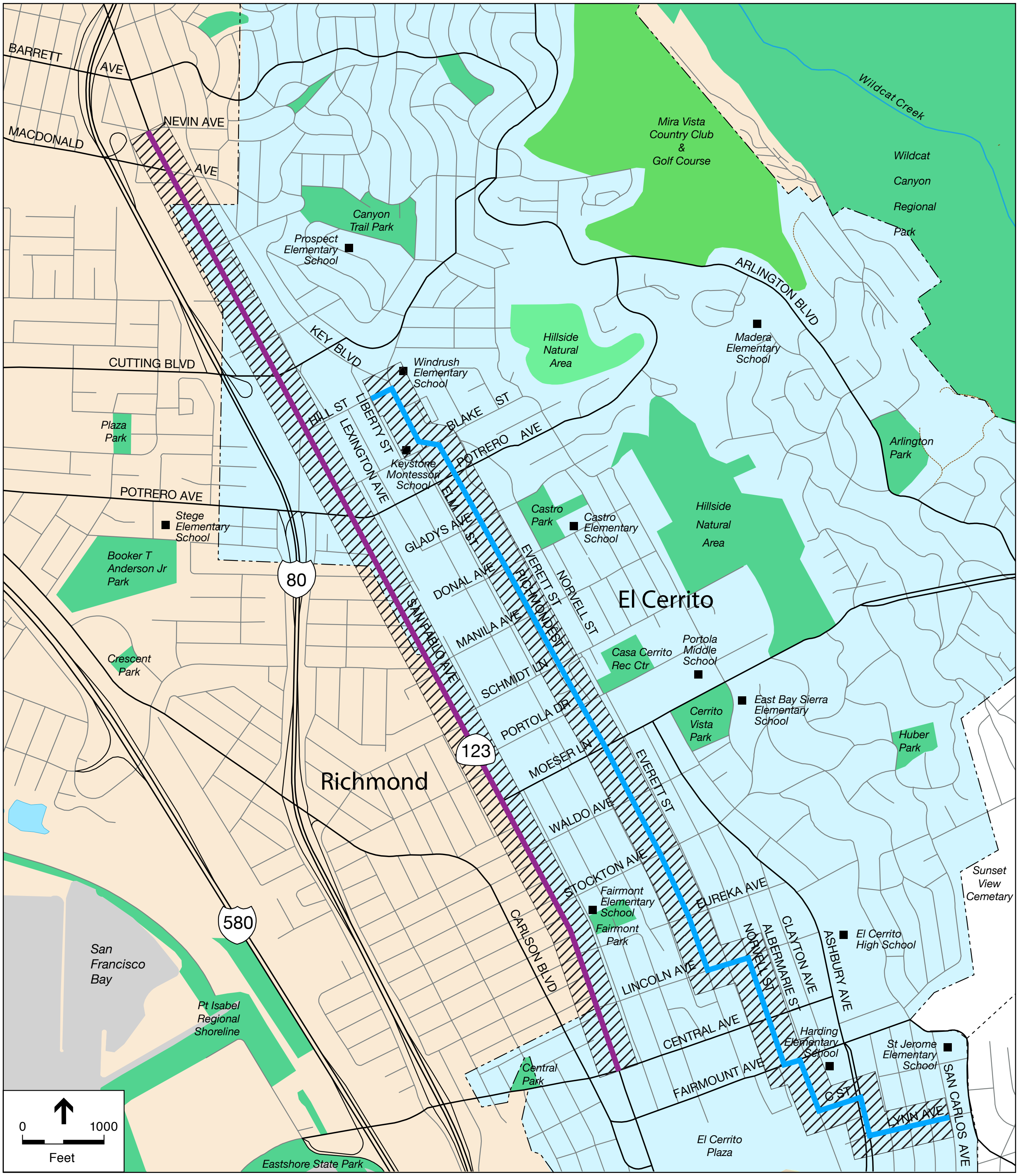
2 Generalist species are able to use a variety of habitats and food sources, unlike many special-status species that are closely restricted to a specific habitat type or food source.




SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure 3.4-1**
Terrestrial Habitat Types
Wildcat Pipeline (Berkeley)




Urban Habitats

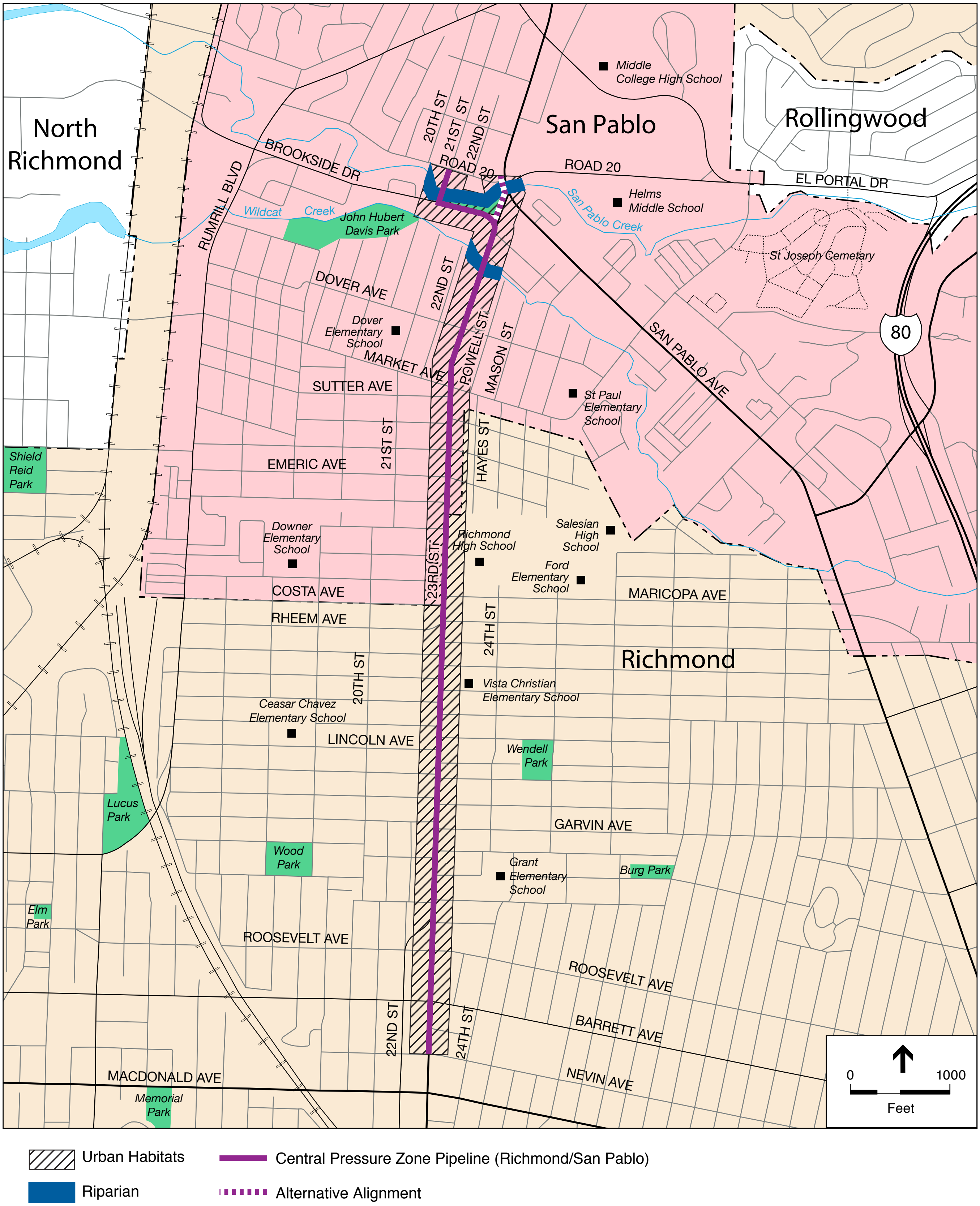
Wildcat Pipeline (El Cerrito)

Central Pressure Zone Pipeline (El Cerrito/Richmond)

SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure 3.4-2**
Terrestrial Habitat Types
Wildcat Pipeline (El Cerrito)
Central Pressure Zone Pipeline (El Cerrito/Richmond)




SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure 3.4-3**
Terrestrial Habitat Types
Central Pressure Zone Pipeline (Richmond/San Pablo)

### Riparian

Areas classified as riparian consist of vegetation located along streams, lakes and rivers. Both San Pablo and Wildcat Creek support riparian habitat within the project area. Trees occurring along the creeks include arroyo willow (*Salix lasiolepis*), California box-elder (*Acer negundo*), white alder (*Alnus rhombifolia*), California buckeye (*Aesculus californica*), California bay (*Umbellularia californica*) and coast live oak (*Quercus agrifolia*).

The proposed San Pablo Creek crossing at the north end of the Central Pressure Zone Pipeline (Richmond/San Pablo) is at the western end of Kennedy Park. A fence at the top of bank separates the maintained lawn on the south side of the creek from the streambank vegetation, which is a dense stand of coast live oaks, willows, and California bays providing deep shade with a limited understory (**Figure 3.4-4**). The top of bank on the north side soon gives way to residences. On the alternative alignment adjacent to San Pablo Avenue, the tree canopy is more open, including box-elder and buckeye with a mixed understory of native and non-native species including Canary ivy (*Hedera canariensis*), Himalayan blackberry (*Rubus armeniacus [=R. procerus]*), and Cape ivy (*Delairea odorata*) as well as a limited number of native plant species.

Wildcat Creek, a much smaller stream, has a narrower channel, a lower streambank and a narrow band of willows and coast live oaks with a grassy understory.

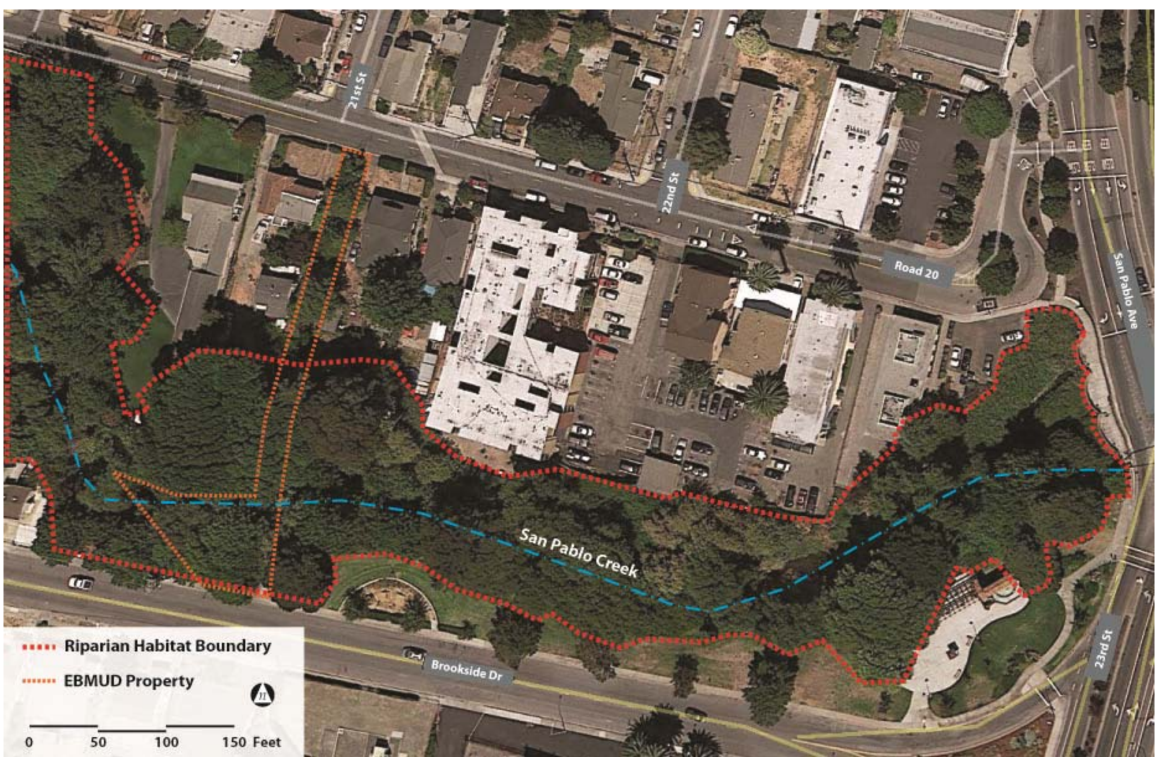



**Figure 3.4-4**
Riparian Habitat at San Pablo Creek

Riparian habitats typically support a diverse assemblage of wildlife. Biologists observed numerous birds using riparian habitat along the creeks, including black phoebe (*Sayornis nigricans*), English sparrow, Anna's hummingbird, scrub jay (*Aphelocoma californica*), yellow-rumped warbler (*Setophaga coronata* ssp. *auduboni*), chestnut-backed chickadee (*Poecile rufescens*), and lesser goldfinch (*Carduelis psaltria*). This habitat likely also supports common mammals such as raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginica*), and a variety of bat species. Both Wildcat and San Pablo Creek also are likely to serve as a movement corridor for wildlife because of the high degree of cover and the relatively few fences and other obstacles.

The areas of riparian habitat in the project area are rather small and contain many non-native species. They would therefore not be considered high-quality examples of sensitive natural communities as defined by CNDDB; however, riparian habitat has intrinsic value because of its high productivity and varied structure that provides essential habitat for many wildlife species, and is considered by CDFW to be sensitive.

The proposed Project crosses several drainages which are culverted and do not support riparian habitat within the project area. See Section 3.10, Hydrology and Water Quality, for a discussion of the drainages and creeks within the project area.

### *Fishery Resources*

Wildcat Creek flows intermittently in the section including the project area (Urban Creeks Council, 2010). This creek supports a native population of three-spined stickleback (*Gasterosteus aculeatus*) and a population of reintroduced rainbow trout (*Onchorhynchus mykiss*) (Urban Creeks Council, 2010). Rainbow trout are genetically identical to the anadromous steelhead, of which the Central California Coast Steelhead distinct population segment was federally listed as a threatened species in 1997 and reaffirmed in 2006. According to anecdotal evidence, steelhead once ran in Wildcat Creek but were extirpated sometime after 1915. In 1977 and in 1981, CDFW conducted electroshocking surveys in the creek and found neither steelhead nor rainbow trout (Urban Creeks Council, 2010). Rainbow trout were reintroduced in 1983 and have established permanent populations, but there currently is no evidence of in-migrating adult spawners or out-migrating juvenile steelhead (Urban Creeks Council, 2010). Although the primary objective of the Wildcat Restoration Action Plan is to reduce the risk of flooding in Wildcat Creek, restoration of fish habitat, and specifically restoring an anadromous steelhead run, is also a long-term goal.

San Pablo Creek had a large steelhead run until construction of San Pablo Dam in 1919, followed by a steady decline in subsequent decades. The last recorded sighting of a large steelhead population was in 1958, and the most recent record of a steelhead trout in the creek was in 1999 (Leidy et al., 2003 *in* Anderson and Maldague, 2004). Recent surveys have revealed the presence of prickly sculpin (*Cottus asper*), threespine stickleback, California roach (*Hesperoleucus symmetricus*) and Sacramento sucker (*Catostomus occidentalis*) in the mainstem San Pablo Creek (Anderson and Maldague, 2004).

### *Wildlife Species*

As noted in the preceding section, the wildlife found in most of the project area is typical of highly-urbanized settings. Non-native wildlife species are fairly common, and the native species are a limited suite of human-tolerant and disturbance-tolerant species.

### *Wildlife Movement Corridors and Nursery Areas*

The most important wildlife areas in the project area are Wildcat and San Pablo Creeks. Although narrow and confined, these areas provide reliable food, water and cover for many species, and both creeks provide movement corridors for wildlife, connecting critical marsh habitat downstream to protected uplands in open space lands upstream (Urban Creeks Council, 2010). San Pablo Creek is a larger stream with a greater extent of riparian habitat.

## Special-status Species

**Appendix H** provides comprehensive lists of the special-status species that have been documented from, or have potential to occur in suitable habitat within, the project area. These lists were obtained from the CNDDB (CDFG, 2012a), CNPS Electronic Inventory (CNPS, 2012), and the USFWS (2012). Based on review of the biological literature of the region, previous EIRs and surveys in the project vicinity, and an evaluation of the habitat conditions of the project area, many of these species were eliminated from further evaluation because (1) the project area or the immediate area does not provide suitable habitat, or (2) the known range for a particular species is outside of the project area.

The special-status species list presented in **Tables H-1** and **D-2** in **Appendix H** includes species for which potential habitat (i.e., general habitat types) occurs within the vicinity of the project area. Species listed in Tables H-1 and H-2 that are determined to have low potential to occur are not expected to occur within the project area. Special-status species observed, or with a moderate to high potential to occur, within the project area are discussed in detail below.

### *Special-Status Plant Species*

Many special-status species are known from the Oakland East, Oakland West and Richmond quadrangles. However, the field surveys showed that nearly all of the project area is highly-disturbed and natural habitat is extremely limited. After a careful review of the habitats and distribution of the special-status plants known from the region, it was concluded that no special-status plants have moderate or high potential to occur in the project area. The list of species observed was compared with the list of locally unusual plants (Lake, 2010), and no unusual or significant plant were observed in the project area.

### *Special-Status Fish and Wildlife Species*

#### Invertebrates

No special-status invertebrates known from the region were considered to have moderate or high potential to occur in the project area.

### Fishes

**Central Valley and Central California Coast steelhead** (*Oncorhynchus mykiss*)**.** Steelhead populations in the Central California Coast and Central Valley Distinct Population Segments (DPS) are listed as threatened under the Federal Endangered Species Act (FESA). Steelhead possess the ability to spawn repeatedly, maintaining the physiological mechanisms to return to the saltwater environment of the Pacific Ocean after spawning in freshwater. Juvenile steelhead may spend up to four years residing in fresh water prior to migrating to the ocean as smolts. Both steelhead DPS migrate through San Pablo Straits between freshwater spawning and rearing areas and the Pacific Ocean. Both San Pablo and Wildcat creeks once supported steelhead runs, and while steelhead cannot currently migrate up either stream to spawn, lower reaches could support transient individuals. The Wildcat Creek Restoration Plan seeks to create conditions for a restored steelhead fishery.

### Amphibians

**California red-legged frog** (*Rana draytonii*). This species is listed as federally threatened and as a California Species of Special Concern. California red-legged frogs (CRLF) reside in lowlands and foothills in or near permanent or semi-permanent water sources, such as lakes, stock ponds, and slow moving streams with deep pools and dense shrubs or emergent aquatic vegetation. Where water sources are not permanent, red-legged frogs require access to dry-season upland estivation[3] habitat in the form of mammal burrows. Red-legged frogs require at least 11 weeks of permanent water after egg laying for larval development. The nearest CRLF record (CNDDB Occ.1113), and the only one on the Richmond quadrangle, is from the vicinity of San Pablo Dam, several miles upstream from the Project’s San Pablo Creek crossing (CNDDB, 2012). San Pablo Creek in the vicinity of the project area is unlikely to support a resident population of CRLF because there are no side ponds, deep pools or upland refugia. Wildcat Creek possesses even less potential habitat for CRLF because it flows intermittently, lacks adjacent upland habitat and lacks a habitat connection to San Pablo Creek. CRLF are assumed to be not present in Wildcat Creek. The project area is not within the designated critical habitat units for this species in Contra Costa or Alameda County.

### Reptiles

**Western pond turtle** (*Emys marmorata*). The western pond turtle, a California Species of Special Concern, is a thoroughly aquatic turtle found in permanent ponds, rivers, streams, channels, and irrigation ditches with rocky or muddy bottoms, and emergent vegetation. Basking areas used by this species include partially submerged logs, rocks, vegetation mats, and open mud banks. Habitat destruction and stream course degradation are the primary threats to this species. Potentially suitable habitat for this species occurs in and on the banks of San Pablo Creek. Within the project area, Wildcat Creek does not contain habitat because it does not contain permanent water.

[3] Estivation is a period of summer dormancy (similar to winter hibernation) that some animals use to avoid stressful heat or drought conditions.

## Birds

**Cooper's hawk** *(Accipiter cooperii)*. Cooper's hawks are common throughout North America and are found in wooded habitats, including urban areas with well-established trees. They feed on small to medium-size songbirds such as robins, jays, thrushes, woodpeckers, and mourning doves. Cooper's hawks capture prey from cover or a perch, or while flying quickly through dense brush, relying on surprise and considerable maneuverability. They build stick nests in large trees. The most likely habitat for Cooper's hawk within the project area is along San Pablo Creek.

**Great horned owl** *(Bubo virginianus)*. Great horned owls occur throughout North America and are found in a variety of wooded habitats. These large raptors prey on small- to medium-sized mammals such as voles, rabbits, skunks, and squirrels. Great horned owls can often be seen and heard at dusk, perched in large trees. They often use the abandoned nests of crows, ravens, or sometimes squirrels (Ehrlich et al., 1988; Sibley, 2001). Great horned owls may use larger trees along the riparian corridors for roosting or nesting and may forage over nearby grasslands for voles and other small mammals.

**Red-tailed hawk** (*Buteo jamaicensis*). Red-tailed hawks are commonly found in woodlands and open country with scattered trees. These large hawks feed primarily on small mammals, but will also prey on other small vertebrates, such as snakes and lizards, as well as on small birds and invertebrates. Red-tailed hawks nest in a variety of trees in urban, woodland, and agricultural habitats. Larger trees along San Pablo and Wildcat creeks, as well as taller non-native trees such as eucalyptus, may be used by red-tailed hawks for nesting.

**Red-shouldered hawk** (*Buteo lineatus*). Red-shouldered hawks are relatively common in both rural and urban situations and can be found in residential neighborhoods and along riparian corridors or other water bodies. These hawks hunt primarily for mammals, reptiles, and amphibians (Sibley, 2001). Large eucalyptus trees, as well as trees along the riparian corridors in the project area, provide potential nesting habitat for this species.

**American kestrel** *(Falco sparverius)*. American kestrels are the smallest falcons in North America. They are found in a variety of habitats, including grasslands, meadows, deserts, and open urban settings. They employ a variety of strategies for hunting, most commonly perching or hovering, and then pouncing on prey. American kestrels hunt primarily for grasshoppers, lizards, mice and small birds. Kestrels are cavity-nesting birds, depending on trees, cliffs and structures. Riparian trees along Wildcat and San Pablo Creeks provide potential nesting habitat for this species in the project area.

**Allen's hummingbird** (*Selasphorus sasin*). Allen's hummingbirds are restricted to coastal regions from Santa Barbara north to southern Oregon, migrating south to Mexico in the winter. They inhabit brushy woods, gardens and meadows, feeding on flower nectar and some insects. The female builds a nest out of bark, lichen, plant fibers and down feathers in protected places in vegetation, incubating one or two eggs and feeding the young without assistance from the male. Allen's hummingbird has been observed in a number of nearby sites, such as Point Pinole Regional

Park, Miller/Knox Regional Shoreline and Tilden Regional Park. Suitable habitat could occur throughout the project area where gardens and natural vegetation provide nectar and nesting sites.

#### Mammals

**Special status bat species.** The project area provides potential foraging and roosting habitat for three special-status bat species. The **long-eared myotis** (*Myotis evotis*) inhabits nearly all brushlands, woodlands, and forests, seeming to prefer coniferous forests and woodlands. Roosts include caves, buildings, snags, and crevices in tree bark. This species is highly maneuverable in its forays for arthropods over water, open terrain, and in habitat edges. The **fringed myotis** (*Myotis thysanodes*) occurs throughout California and is most frequent in coastal and montane forests and near mountain meadows (Jameson and Peeters, 1988). This species uses echolocation to find moths, beetles, and other prey and forms nursery colonies in caves and old buildings (Jameson and Peeters, 1988). The **Yuma myotis** (*Myotis yumanensis*) roosts in buildings and mines and has been observed roosting in abandoned swallow nests and under bridges (Zeiner et al., 1990). These bat species may utilize vacant or underutilized buildings, eucalyptus trees, or trees along the corridors along Wildcat and San Pablo creeks for roosting and may forage over open areas and along the stream corridors. The San Pablo Avenue bridge crossing of San Pablo Creek near the alternative alignment of the Central Pressure Zone Pipeline (Richmond/San Pablo) was examined for roosting habitat and was found to lack the cavities and crevices favored by roosting bats.

# 3.4.2 Regulatory Setting

This subsection briefly describes federal, state, and local regulations, permits, and policies pertaining to biological resources and wetlands as they apply to the proposed Project.

## Federal Regulations

### *Federal Endangered Species Act*

The USFWS, which has jurisdiction over plants, wildlife, and most freshwater fish, and the National Marine Fisheries Service (NMFS), which has jurisdiction over anadromous fish and marine fish and mammals, oversee implementation of the FESA. *Endangered* refers to species, subspecies, or distinct population segments that are in danger of extinction throughout all or a significant portion of their range. *Threatened* refers to species, subspecies, or distinct population segments that are likely to become endangered in the near future. *Take*[4] of listed species can be authorized through either the Section 7 consultation process for actions undertaken by federal agencies, or through the Section 10 permit process for actions undertaken by non-federal agencies where a Section 404 permit or other federal approval is not required.

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[4] *Take*, as defined in Section 9 of the FESA, is broadly defined to include intentional or accidental *harassment* or *harm* to wildlife. *Harass* is further defined by the USFWS as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, and sheltering. *Harm* is defined as an act which actually kills or injures wildlife. This may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

Section 7 of the FESA mandates that all federal agencies consult with the USFWS and NMFS to ensure that federal agencies actions do not jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat for listed species. A federal agency is required to consult with USFWS and NMFS if it determines a "may affect" situation will occur in association with a proposed Project. The FESA prohibits the take of any fish or wildlife species listed as threatened or endangered, including the destruction of habitat that could hinder species recovery.

Section 10 of the FESA requires the issuance of an "incidental take" permit before any public or private action may be taken that would potentially harm, harass, injure, kill, capture, collect, or otherwise hurt (i.e., take) any individual of an Endangered or Threatened species. The permit requires preparation and implementation of a habitat conservation plan that would offset the take of individuals that may occur, incidental to implementation of the project, by providing for the overall preservation of the affected species through specific mitigation measures.

### *Migratory Bird Treaty Act*

The federal Migratory Bird Treaty Act (MTBA) (16 USC, Section 703, Supplement I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

### *Wetlands and Jurisdictional Waters*

Wetlands and other waters (e.g., rivers, streams, and natural ponds) are a subset of "waters of the U.S.," and receive protection under Section 404 of the Clean Water Act (CWA). The USACE has primary federal responsibility for administering regulations that concern waters of the U.S. In this regard, the USACE acts under two statutory authorities: the Rivers and Harbors Act (Sections 9 and 10), which governs specified activities in "navigable waters," and the Clean Water Act (Section 404), which governs specified activities in waters of the U.S., including wetlands. The U.S. Environmental Protection Agency (U.S. EPA) has the ultimate authority for designating dredge and fill material disposal sites and can veto USACE issuance of a permit to fill jurisdictional waters of the U.S.

The USACE requires a permit if a project proposes placement of structures within navigable waters and/or alteration of waters of the U.S. Some classes of fill activities may be authorized under Regional General or Nationwide permits if specific conditions are met. Nationwide permits do not authorize activities that are likely to jeopardize the existence of a threatened or endangered species (listed or proposed for listing under the FESA). The Nationwide permit outlines general conditions and may specify project-specific conditions as required by USACE during the Section 404 permitting process. When a project's activities do not meet the conditions for a Nationwide Permit, an Individual Permit may be issued by the USACE.

The federal government also supports a policy of minimizing "the destruction, loss, or degradation of wetlands." Executive Order 11990 (May 24, 1977) requires that each federal agency take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

## State Regulations

### *California Endangered Species Act*

Under the California Endangered Species Act (CESA), take[5] is prohibited of plant and animal species designated by the Fish and Game Commission as either threatened or endangered in the State of California. Section 2081 of CESA allows the CDFW to authorize exceptions to the state's prohibition against take of a listed species, such as for educational, scientific, or management purposes. Private developers whose projects do not involve a state lead agency under CEQA may not take a listed species without formally consulting with the CDFW and agreeing to strict measures and standards for managing the listed species.

Pursuant to the requirements of the CESA, an agency reviewing a proposed Project within its jurisdiction must determine whether any state-listed endangered or threatened species could be present and determine whether the proposed Project could have a potentially significant impact on such species. In addition, CDFW encourages informal consultation on any proposed Project that may affect a candidate species.

### *California Environmental Quality Act*

The intent of CEQA is to maintain "high-quality ecological systems and the general welfare of the people of the state." It is the policy of the state to "prevent the elimination of fish or wildlife species due to man's activities, ensure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities and examples of the major periods of California history." CEQA forbids agencies from approving projects with significant adverse impacts when feasible alternatives or feasible mitigation measures can substantially reduce such impacts.[6]

CEQA requires consultation with CDFW on any project an agency initiates that is not statutorily or categorically exempt from CEQA. The CEQA *Guidelines* (Section 15065(a)) indicate that impacts to state- and federally listed rare, threatened, or endangered plants or animals are significant. Under Section 15380 of the CEQA *Guidelines*, impacts to other species that meet certain criteria (i.e., it can be shown that the species' survival in the wild is in jeopardy or it is at risk of becoming endangered in the near future) but are not officially listed may also be considered significant by the lead agency (for an EIR), depending on the applicability of other laws (e.g., MBTA) and the discretion of the agency. For example, CDFW interprets Ranks 1A, 1B, and 2 of the CNPS *Inventory of Rare and Endangered Vascular Plants of California* to consist of plants that, in a majority of cases, would qualify for listing as rare, threatened, or endangered. However, the determination of whether an impact is significant is a function of the lead agency, absent the protection of other laws. Through CEQA review agencies must

5 *Take* in the context of CESA means to hunt, pursue, kill, or capture a listed species, as well as any other actions that may result in adverse impacts when attempting to take individuals of a listed species. The take prohibitions also apply to candidates for listing under CESA.

6 CEQA also provides that a project might be approved in spite of residual, unmitigated significant impacts, by adoption of a statement of overriding social and economic considerations in situations where mitigations or alternatives are deemed infeasible.

specifically address potential impacts to listed species and provide mitigation measures if the impact is significant.

### CEQA Guidelines Section 15380

CEQA *Guidelines* Section 15380(b) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in the FESA and the section of the California Fish and Game Code dealing with rare or endangered plants or animals. This section was included in the CEQA Guidelines primarily to deal with situations in which a public agency is reviewing a project that may have a significant effect on, for example, a "candidate species" that has not yet been listed by either the USFWS or CDFW. Thus, CEQA provides an agency with the ability to protect a species from a project's potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

### California Fish and Game Code

Under Section 3503 of the California Fish and Game Code, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.3 of the California Fish and Game Code prohibits take, possession, or destruction of any birds in the orders Falconiformes (hawks) or Strigiformes (owls), or of their nests and eggs.

The California Fish and Game Code also designates certain species as Fully Protected. This designation provides a greater level of protection than is afforded by the CESA, since it means the designated species cannot be taken at any time.

### California Native Plant Protection Act

State listing of plant species began in 1977 with the passage of the California Native Plant Protection Act (NPPA), which directed CDFW to carry out the legislature's intent to "preserve, protect, and enhance endangered plants in this state." The NPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare and to require permits for collecting, transporting, or selling such plants. CESA expanded upon the original NPPA and enhanced legal protection for plants. CESA established threatened and endangered species categories, and grandfathered all rare animals—but not rare plants—into the act as threatened species. Thus, there are three listing categories for plants in California: rare, threatened, and endangered.

### Sensitive Natural Communities

Sensitive natural communities are identified as such by CDFW's Natural Heritage Division and include those that are naturally rare and those whose extent has been greatly diminished through changes in land use. The CNDDB tracks 135 such natural communities in the same way that it tracks occurrences of special-status species: information is maintained on each site's location, extent, habitat quality, level of disturbance, and current protection measures. CDFW is mandated to seek the long-term perpetuation of the areas in which these communities occur. While there is no statewide law that requires protection of all special-status natural communities, CEQA requires consideration of a project's potential impacts on biological resources of statewide or regional significance.

### *Wetlands and Jurisdictional Waters*

#### Regional Water Quality Control Board

The RWQCB regulates waters of San Francisco Bay Region under the federal Clean Water Act and the California Porter-Cologne Water Quality Control Act. Under Section 401 of the Clean Water Act, the RWQCB has review authority of Section 404 permits. The RWQCB has a policy of no net loss of wetlands and typically requires mitigation for all impacts to wetlands before it will issue a water quality certification. Dredging, filling, or excavation of isolated waters constitutes a discharge of waste to waters of the state, and prospective dischargers are required to submit a report of waste discharge to the RWQCB.

#### California Department of Fish and Game

Under Sections 1600–1616 of the California Fish and Game Code, CDFW regulates activities that would substantially divert, obstruct the natural flow of, or substantially change rivers, streams, and lakes. The jurisdictional limits of the CDFW are defined in Section 1602 of the Fish and Game Code as the "bed, channel, or bank of any river, stream, or lake." Activities that would "deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake" are prohibited by the CDFW unless a streambed alteration agreement is issued. Potential impacts to the jurisdictional area of the CDFW are considered significant in this EIR.

## Local Policies

### *East Bay Municipal Utility District*

Pursuant to California Government Code Section 53091, EBMUD, as a local agency and utility district serving a broad regional area, is not subject to building and land use zoning ordinances (such as tree ordinances) for projects involving facilities for the production, generation, storage, or transmission of water. However, it is the practice of EBMUD to work with host jurisdictions and neighboring communities during project planning and to conform to local environmental protection policies to the extent practical.

#### City of Berkeley

City of Berkeley's General Plan policies relating to the Berkeley's biological resources include:

> ***Policy EM-28 Natural Habitat:*** Restore and protect valuable, significant, or unique natural habitat areas.

> ***Policy EM-29 Street and Park Trees:*** Maintain, enhance and preserve street and park trees to improve the environment and provide habitat.
>
> ***Policy EM-30 Native Plants*****:** Use native tree and plant species to enhance ecological richness.
>
> ***Policy UD-9 Trees:*** Wherever feasible and appropriate, tree replacement should emphasize maintaining historic planting patterns and native species and be consistent with the City of Berkeley 1990 Street Tree Policy or subsequent tree policies. (City of Berkeley, 2003)

The City of Berkeley also has a tree protection ordinance (No. 6,905-N.S.) that protects coast live oaks, specifically single-stem trees with a circumference of 18 inches at 4 ft above ground level, or multiple-stemmed trees with an aggregate circumference of 26 inches. In addition, the Berkeley Municipal Code (Chapter 12.44, Trees and Shrubs, Section 20), provides the following:

> It is unlawful for any person to cut, trim, remove, mutilate, injure or in any way impair the growth of any tree, shrub or plant being or growing in or on any street, parking strip, public square, park or playground in the City, or to cause or permit the same to be done. Provided, however, that in the event that any person desires permission to cut, trim, remove or in any way impair the natural growth of any such tree, shrub or plant, application shall first be made to the Director of Recreation and Parks for a permit. Upon receipt of such application, the Director of Recreation and Parks may cause an inspection to be made and may thereafter issue or refuse to issue a permit for such work. Provided, further, that whenever it is deemed necessary by the Director of Recreation and Parks, he may require the work specified in said application, or any part thereof, to be done under his supervision, and the cost of such supervision shall be borne by the applicant if so determined by the Director of Recreation and Parks. (Ord. 3380-NS § 2, 1954)

### City of El Cerrito

The City of El Cerrito established its General Plan in 1999 (City of El Cerrito, 1999). General Plan policies relating to the City's biological resources include:

> ***R1.1 Habitat Protection:*** Preserve oak woodland, riparian vegetation, creeks, native grasslands, wildlife corridors and other important wildlife habitats.
>
> ***R1.2 Rare and Endangered Species:*** Limit development in areas that support rare and endangered species. If development of these areas must occur, any loss of habitat should be fully compensated on-site. If off-site mitigation is necessary, it should occur within the El Cerrito planning area whenever possible.
>
> ***R1.3 Potential Environmental Impacts:*** Encourage development patterns that minimize impacts on the City's biological, visual and cultural resources, and integrate development with open space areas.
>
> ***R1.9 Development near Creeks:*** For development adjacent to creeks and major drainages, provide adequate building setbacks from creek banks, provision of access easement for creek maintenance purposes and for public access to creekside amenities, and creek improvements such as bank stabilization. Also protect riparian vegetation outside the setback.

***R.1.11 Native Plant Communities:*** Encourage use of native plant species for landscaping in hillside areas, preserve unique plant communities, and use fire-preventive landscaping techniques.

***R2.3 Vegetation:*** Include significant trees and other plant materials in the definition of significance.

### City of Richmond

The City of Richmond set forth a number of natural resource policies and implementation measures in the Conservation, Natural Resources and Open Space Element of the City of Richmond General Plan (City of Richmond, 2012) applicable to the Project. General Plan policies relating to the City's biological resources include:

***Policy CN1.1:*** Work with public and private land owners to protect natural habitat and biodiversity and preserve biological resources.

***Policy CN1.2:*** Promote the use of locally propagated native plant and tree species and remove and control the spread of invasive exotic plant species.

***Policy CN1.3:*** Encourage the restoration of urban creeks.

***Policy CN2.1:*** Preserve, enhance and restore open space areas along the shoreline and creeks and in the hills to protect natural habitat.

***Policy CN2.3:*** Protect natural topography to preserve and enhance the natural beauty of the Richmond area.

***Policy CN2.6:*** Support efforts to minimize soil depletion and erosion while encouraging soil protection.

***Policy CN3.2:*** Reduce stormwater runoff in urban areas to protect water quality in creeks, water bodies, and bays.

***Policy CN6.2:*** Protect and expand tree resources within Richmond, including native trees, heritage trees, and oak woodlands.

### City of San Pablo

The City of San Pablo completed its General Plan in 2011, with several natural resource policies relevant to the proposed Project (City of San Pablo, 2011):

***OSC-G-3:*** Protect and enhance wetlands, creek systems, and rare and endangered species and their habitats.

***OSC-I-4:*** Protect sensitive habitat areas and "Special status" species through measures implemented in new development in the following order: 1) avoidance; 2) on-site mitigation; and 3) offsite mitigation, and require assessments of biological resources prior to approval for any development within 300 feet of any creeks, wetlands or other sensitive habitat areas.

***OSC-I-8:*** If site work or construction (i.e., ground clearing or grading, including removal of trees or shrubs) activities are to occur during the nesting bird breeding season (February 1 through August 31), the City will require a pre-construction survey by a qualified wildlife biologist, assessing potential special-status bird nesting habitat within 500 feet of the project site, no more than 2 weeks in advance of the planned activity. All identified nests should be buffered from the construction activity as recommended by the biologist and confirmed by the City staff.

***OSC-I-9:*** For any development projects involving removal of mature trees and/or demolition of vacant buildings (both potential habitats for special-status bats), require a pre-construction survey by a qualified wildlife biologist to determine if bats are present using an acoustic detector. Require implementation of feasible recommendation of the biologist on removal of trees with signs of bat activity during a period least likely to adversely affect the bats, or the creation of a "no disturbance" buffer, if a viable alternative.

***OSC-G-4:*** Ensure both access and ecological functionality of the creek system in San Pablo.

### *Wildcat Creek Restoration Action Plan*

The Wildcat Creek Restoration Action Plan (WRAP) (Urban Creeks Council, 2010) recommends strategies for management of seven reaches of Wildcat Creek between I-80 and the Union Pacific Railroad tracks. This plan provides recommendations to reduce flood risk for neighborhoods, improve riparian habitat for wildlife, and develop recreational resources along the creek for residents.

# 3.2.3 Impacts and Mitigation Measures

## Significance Criteria

For the purposes of this EIR and consistent with Appendix G of the CEQA Guidelines, the West of Hills Northern Pipelines Project is considered to have a significant impact if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service.
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

## Approach to Analysis

### *Methodology*

Potential impacts resulting from implementation of the proposed Project were evaluated based on a field reconnaissance survey and a review of the following sources:

- Existing resource maps and aerial photographs of the project area and environs
- Data presented in the CNDDB, the CNPS Electronic Inventory of Rare and Endangered Vascular Plants of California, and an unofficial USFWS species list (CDFG, 2012a; CNPS, 2012; USFWS, 2012). All databases were queried for three USGS 7.5 minute quadrangles: Oakland East, Oakland West, and Richmond
- Standard biological references (e.g., Zeiner, 1990)
- Previous EIRs, other environmental documents, resources, and surveys for Richmond and the northern San Francisco Bay
- Other available literature regarding the natural resources of the area

### *Impacts not Requiring Further Analysis*

The implementation of the proposed Project would not conflict with the provisions of any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

## Impacts and Mitigation Measures

**Impact 3.4-1: The proposed Project could have a substantial adverse effect on special-status species during open-trench construction in urban habitat (applies to all pipelines).**

As discussed in the setting section, no special-status plants are known to occur within or adjacent to the project area and no suitable habitat was found for any of the special-status plants known from the region. Therefore, this impact discussion addresses only special-status animal species.

Construction activities could remove the nesting and foraging habitat of special-status birds and other wildlife, including bats, through direct removal of habitat. Disruption of breeding and foraging could occur due to construction noise and activity.

As stated in the project description, construction of the Wildcat Pipeline (Berkeley) would require the removal of approximately two trees in the open space between The Uplands and Parkside Drive. Based on the location of the proposed crossing of this open space, the trees to be removed there would be non-native ornamentals. The limbs and roots of additional trees located within the public right of way would be trimmed in this area. For the proposed Central Pressure Zone Pipeline (Richmond/San Pablo) some trees would be removed on two EBMUD-owned properties on either side of San Pablo Creek (see Impact 3.4-2 for a discussion of impacts from pipe bridge construction near San Pablo Creek). In other urban habitats, construction will be limited to within the roadways, and no large mature trees have been identified for removal.

Smaller trees or shrubs could be removed and roots may be trimmed if they extend under the streets. Tree removal would be scheduled for the period September 1 through January 31 to avoid the nesting season of birds. Native oaks would be avoided to the extent practical. Habitat in urban habitat is very limited for long-eared myotis, fringed myotis, and Yuma myotis due to the lack of foraging habitat and large trees for roosting. Impacts on these species would be *less than significant*. In urban habitat, there is limited potential for noise and vibration to disturb nesting Cooper's hawk, red-tailed hawk, red-shouldered hawk, American kestrel, and Allen's hummingbird, but construction activity would represent a modest increase over ambient levels of noise and vibration in these generally well-traveled streets. Impacts on these species would be *less than significant*.

Construction of the proposed Project in urban habitats using trenching methods would result in *less-than-significant* impacts associated with the temporary and permanent habitat loss and disruption of breeding and foraging habitat for special-status amphibians, reptiles, nesting birds, raptors and bats.

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**Impact 3.4-2: The proposed Project could have a substantial adverse effect on special-status species in Riparian habitats during construction at creek crossings using jack and bore and pipe bridge methods (Central Pressure Zone Pipeline [Richmond/San Pablo]).**

As discussed in the setting section, no special-status plants are known to occur within or adjacent to the project area and no suitable habitat was found for any of the special-status plants known from the region. Therefore, there would be no impact on special-status plants.

The following discussion addresses potential impacts on special-status animals.

### California Red-legged Frog, Steelhead and Western Pond Turtle

The streambed of Wildcat Creek contains marginal potential aquatic habitat for California red-legged frog in this reach and there is no breeding habitat available. CRLF are only expected to occur there on a transient basis. Upland habitat for CRLF and western pond turtle is only present in small, isolated patches of marginal quality along Wildcat and San Pablo Creeks in the project area. It is not anticipated that individual frogs or turtles, if present in either creek, would move upland from the riparian corridor due to the lack of suitable habitat. There is no evidence of species occurrence in this highly urbanized portion of Wildcat Creek, so activity in nearby uplands from jack and bore construction is not expected to have direct impacts on CRLF. Similarly no direct impacts on steelhead and western pond turtle would occur at Wildcat Creek because the activity associated with jack and bore construction would be well away from the top of the streambank.

Direct loss of individual frogs and turtles is not expected at the San Pablo Creek crossing because suitable aquatic habitat is limited, upland habitat is not considered suitable, as noted above, and there are no nearby records of these species occurring in San Pablo Creek.

Direct loss of steelhead is unlikely because the only potential occurrence of this species would be limited to migrating strays belonging to populations in other watersheds; even in the unlikely event of a migrating stray, construction of the pipe bridge would not affect steelhead because construction would not occur during the winter steelhead migrating season.

Construction activities in the vicinity of the San Pablo Creek and Wildcat Creek crossings could result in loss or degradation of aquatic habitat for CRLF, steelhead and western pond turtle because of the potential for erosion and sedimentation or hazardous spills during construction of the pipe bridge footings and the jack and bore activities. Therefore, the only potentially significant impacts on CRLF, steelhead and western pond turtle in Wildcat or San Pablo Creek are construction-related discharge of sediment, bank erosion, or accidental spills of hazardous materials, such as hydraulic fluid, concrete, or gasoline that could degrade aquatic habitat. However, as described more completely in Section 3.10, Hydrology and Water Quality, these impacts will be reduced to *less-than-significant* levels through compliance with EBMUD construction specifications, including compliance with the Construction General Stormwater Permit (which includes preparation of a Stormwater Pollution Prevention Plan), as well as Contra Costa County Flood Control and Water Conservation District requirements for construction near Wildcat Creek and San Pablo Creek; and additional Best Management Practices (BMPs) as required (including construction of mandatory sediment controls along the toe of slopes, face of the slope, and at grade breaks; protecting storm drain inlets and providing perimeter controls, runoff controls, and pollutant controls at entrances and exits). In addition, Mitigation Measure HYD-1**,** *Schedule Construction Activities at Harwood Creek, Wildcat Creek, and San Pablo Creek During the Dry Season*, requires contractors to schedule construction activities at these locations during the dry season (i.e., between June 1 and October 15) to ensure that construction debris and equipment are not subjected to heavy winter storms that could overwhelm construction BMPs implemented as part of the SWPPP.

### Nesting Birds, Raptors, and Bats

Construction activities along San Pablo Creek could remove the nesting and foraging habitat of special-status birds and other wildlife, including bats, through direct removal of habitat, in particular riparian trees. This represents a potentially significant impact. Disruption of breeding and foraging could also occur in adjacent habitats due to construction noise and activity at both Wildcat and San Pablo Creeks.

For the proposed Central Pressure Zone Pipeline (Richmond/San Pablo) some large trees would be removed on EBMUD-owned properties on either side of San Pablo Creek. As described in the project description, tree removal would be either be scheduled for the period September 1 through January 31 to avoid the nesting season of birds, thus avoiding direct loss of nests and young, or after pre-construction nesting bird surveys confirm that tree removal would not impact nesting birds during the breeding season. Native oaks would be avoided to the extent practical. The permanent loss of mature trees in the San Pablo Creek riparian zone is potentially significant.

Within the proposed construction area at San Pablo Creek, foraging habitat is present for long-eared myotis, fringed myotis, and Yuma myotis, although roosting and breeding habitat is limited. Nesting Cooper's hawk, red-tailed hawk, red-shouldered hawk, American kestrel, and Allen's hummingbird could be impacted because of loss of riparian trees and disturbance of habitat in close proximity to the Project through noise and vibration. The impact of construction at San Pablo Creek on these special-status species is potentially significant.

In the riparian zone of Wildcat Creek, foraging habitat is present for long-eared myotis, fringed myotis, and Yuma myotis, although roosting and breeding habitat is limited. Cooper's hawk, red-tailed hawk, red-shouldered hawk, American kestrel, and Allen's hummingbird could nest in the riparian zone or nearby trees. There will be no loss of riparian habitat at Wildcat Creek because the jack and bore construction method avoids the riparian zone. Some increased noise and vibration could be experienced by special-status wildlife in and near Wildcat Creek. Although the affected area would be limited and the area already experiences high levels of ambient noise and vibration, the potential impact of construction at Wildcat Creek on special-status species is potentially significant.

Construction of the proposed pipe bridge at Wildcat Creek and San Pablo Creek could result in potentially significant indirect impacts associated with the temporary degradation of aquatic habitat for California red-legged frog, steelhead and western pond turtle, and disruption of breeding and foraging habitat for nesting birds, bats, and raptors. However, with implementation of standard noise reduction measures (NOI-1) and Mitigation Measure BIO-1a through BIO-1d described below, these impacts would be reduced to *less than significant*.

**Mitigation Measure BIO-1a: General Protection Measures.**

EBMUD will ensure that the following general measures are implemented by the contractor(s) during construction to minimize or avoid impacts on biological resources:

- Removal of native and ornamental trees and shrubs will be minimized by locating staging areas away from vegetated areas and restricting construction areas in vegetated areas to the extent practical. No trees will be removed from private property.
- At the San Pablo Creek crossing, temporary fencing will be installed at the perimeter of the pipe bridge work area to protect trees on private property (see also description of exclusion fence, in Measure BIO-1b). The contractor will maintain the temporary fencing until all construction activities are completed. No construction activities, parking, or staging will occur beyond the fenced areas.
- The contractor will provide closed garbage containers for the disposal of trash items (e.g., wrappers, cans, bottles, food scraps). All food-related garbage will be collected daily from the project site and placed in a closed container, from which garbage will be removed weekly.
- Construction personnel will not feed or otherwise attempt to attract fish or wildlife in the project area.
- If vehicle or equipment fueling or maintenance is necessary, it will be performed in the designated staging areas located at least 50 feet from the top of bank of watercourses.

**Mitigation Measure BIO-1b: Riparian Protection Measures.**

- Prior to the start of pipe bridge construction at San Pablo Creek, silt fencing or other appropriate erosion control measures will be installed at the limit of the construction areas near the top of bank and extending to the limit of EBMUD property at Brookside

Drive and private property on the north side of San Pablo Creek and along the limits of construction facing Wildcat Creek. Silt fencing will be at least three feet high, and with a bottom edge buried at least three inches, to contain sediment and potential spills within the work area.

- Construction contractor(s) will minimize the extent of the construction disturbance as much as feasible, especially within the drip lines of riparian trees and the bed and bank of San Pablo Creek by locating staging areas outside of riparian areas and restricting construction areas in riparian areas to the extent practical.
- A construction employee education program will be conducted prior to the initiation of ground disturbing activities at the San Pablo Creek pipe bridge construction area. The program will consist of a brief presentation by persons knowledgeable about California red legged frog, steelhead, western pond turtle, raptor and nesting bird biology and legislative protection to explain endangered species concerns to contractors and their employees. The program will include a description of the measures to be taken to reduce impacts to these species during project construction and implementation. A fact sheet in English and Spanish conveying this information will be prepared for distribution to the above-mentioned people and other Project-related personnel entering the San Pablo Creek riparian corridor. At a minimum, the program would include:
    - Description and natural history of the species;
    - Representative photographs;
    - Species' legal status;
    - Measures to prevent the spread of invasive, non-native species;
    - Terms and conditions of any biological permits; and
    - Penalties for not complying with terms and conditions.

**Mitigation Measure BIO-1c: Implement preconstruction surveys near riparian habitat.**

During the breeding bird season (February 1 through August 31) and not more than two weeks before onset of construction (including equipment mobilization) of the tunnel beneath Wildcat Creek and the pipe bridge over San Pablo Creek a qualified biologist will conduct preconstruction surveys for nesting raptors and songbirds within 500 feet of the construction area.

- Surveys will include all potential habitats within 500 feet (for raptors) of activities and all on-site vegetation including bare ground within 250 feet of activities (for all other species).
- If construction activities occur only during the non-breeding season, between September 1 and January 31, no surveys will be required.
- Results of the surveys will be forwarded to CDFW (if results are positive for nesting birds) and avoidance procedures will be adopted, if necessary, on a case-by-case basis. These may include construction buffer areas or seasonal avoidance. Typical buffer distances are 250 feet for non-raptor species, and 500 feet for raptors but these may be adjusted through consultation with CDFW on a case by case basis.

Prior to removal of mature trees at San Pablo Creek, a pre-construction survey will be carried out by a qualified wildlife biologist using an acoustic detector. If signs of bat activity are detected, the biologist will make recommendations about how to minimize adverse effects to the bats, such as adjusting timing of tree removal, or creating a "no disturbance" buffer, if feasible.

**Mitigation Measure BIO-1d: Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation for Riparian Habitats.**

This measure would apply only to San Pablo Creek crossing, which is the only location where natural habitat would be directly impacted.

At least one month prior to construction and during the plant growing season (March-July), a qualified botanist performs preconstruction surveys of the construction area to collect vegetation composition data, vegetation structure (tree diameter size, etc.), and percent cover of plant species. Photo documentation will be used to show pre-project conditions.

Prepare and implement a vegetation restoration plan with detailed specifications for minimizing the introduction of invasive weeds and restoring all temporarily disturbed areas.

For the purpose of existing pipeline maintenance as well as proposed pipe bridge construction, trees removed at the alternative San Pablo Creek crossing on EBMUD land would not be replaced on-site. Shrubs and other plants will be re-planted on EBMUD land within the pipeline alignment. Replacement tree planting could occur on-site if the selected San Pablo Creek crossing is the eastern alternative adjacent to 23rd Street and Kennedy Plaza. However, to allow for access to the pipeline, replanted trees will not be located within 20 feet of the pipeline. Tree replacement will adhere to the following guidelines:

- If any mature native tree (i.e., trees that are 6 inches in diameter at breast height [dbh] or ten inches aggregate dbh for multi-trunk trees) is removed, replanting will be with the same species at a 1:1 ratio.
- All non-native protected trees which are removed will be replaced at a 1:1 ratio with a non-invasive tree species.
- Non-native trees removed from a natural environment will be replaced with a native species that occurs in the area.
- Efforts will be made to plant replacement trees within the San Pablo Creek watershed. However if no ecologically appropriate sites are available within the watershed, EBMUD will work with local organizations to plant trees in adjacent watersheds on public lands.
- In lieu of tree replacement (if the San Pablo Creek pipe bridge is constructed within EBMUD's utility corridor), EBMUD will fund riparian or upland restoration work by a local creek group (such as San Pablo Watershed Neighbors Education and Restoration Society (SPAWNERS) or Friends of Five Creeks) for the purposes of compensating for tree loss associated with the Project. In-lieu restoration work would be appropriate where restoration activities would provide greater benefit to protected trees than tree replacement. Examples of appropriate restoration work include invasive plant removal or actions to reduce exposure or risk of sudden oak death. The funded restoration work must provide habitat benefits commensurate with that lost through the removal of trees.
- Implementation of in-lieu restoration, especially tree planting, is recommended well in advance of construction of the Central Pressure Zone Pipeline (Richmond/San Pablo) because it would ensure that replacement trees are established and beginning to provide habitat values for wildlife by the time project construction is expected to commence. Planting would be carried out at streambank restoration sites elsewhere within the watershed.

If required, EBMUD will provide the vegetation restoration and replacement plan to the USACE, CDFW, RWQCB, and USFWS during the permitting process, as any vegetation to be removed may provide habitat for special-status species and may also be within areas under the jurisdiction of the USACE and RWQCB. The determination of mitigation requirement (i.e., extent of habitat loss) and accumulated habitat values for advance in-lieu restoration would be determined during the permitting process. The minimum avoidance, minimization, and restoration measures as well as success criteria to be included in the vegetation restoration plan are described below.

***Invasive Weed Control Measures.*** Invasive weeds such as Canary ivy, Himalayan blackberry, and Cape ivy readily colonize riparian soils that have been disturbed by grading or other mechanical disturbance. Although the project area has an extensive weed infestation and relatively few native species, EBMUD will incorporate the following measures into the construction plans and specifications for construction within riparian zones of San Pablo Creek and Wildcat Creek to permit restored riparian vegetation to become established and to prevent the spread of additional invasive species:

- Construction equipment will arrive at the project area washed and free of soil, seed, and plant parts to reduce the likelihood of introducing new weed species.
- Any imported fill material, soil amendments, gravel etc., required for construction and/or restoration activities that would be placed within the upper 12 inches of the ground surface will be free of vegetation and plant material.
- California Department of Food and Agriculture-certified, weed-free, imported erosion-control materials (or rice straw in upland areas) will be used exclusively, as applicable (this measure concerns biological material and does not preclude the use of silt fences, etc.).
- The environmental awareness training program for construction personnel will include an orientation regarding the importance of preventing the spread of invasive weeds.
- The restoration plan will specify measures to remove and/or control weeds in the project area.
- No invasive species will be used in any restoration plantings.

***Minimum Restoration Measures.*** San Pablo Creek has the only riparian areas within the project area that would be disturbed during Project-related construction activities and would subsequently be restored to their preconstruction conditions as defined by the success criteria described below:

- Tree replacement and re-vegetation will occur within the first year after the completion of construction.
- A qualified arborist or biologist will monitor newly planted trees at least twice a year for 5 years.
- Any trees planted as remediation for failed plantings will be planted as stipulated here for original plantings, and will be monitored for a period of 5 years following installation, or as otherwise determined by the applicable resource agencies.
- Where native vegetation is present and/or for erosion control purposes, all temporarily disturbed areas will be restored to approximate their baseline condition.

Pre-construction baseline monitoring will be conducted to determine vegetative cover at the site. Revegetation success criteria will be based on the baseline monitoring and will stipulate that site cover of target weed species is equal to or less than the baseline condition.

- At the end of the 5 year monitoring period, vegetation within restoration areas will be functional, fully established, and self-sustaining as evidenced by healthy vegetative growth; observed increase in vegetative cover, canopy cover, and/or plant height; successful flowering, seed set, and/or vegetative reproduction over the monitoring period.
- Restoration areas will be monitored for target invasive plants during the 5-year monitoring period, and they will be removed as necessary to support meeting the cover and vegetation composition success criteria.
- Monitoring and maintenance will continue until the minimum success criteria are met, or as otherwise determined by the applicable resource agencies.

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**Impact 3.4-3: The proposed Project could have a substantial adverse effect on jurisdictional waters during construction (applies to all pipelines).**

Construction of the pipeline crossings over San Pablo Creek could result in temporary loss of riparian habitat, which is jurisdictional under CDFW code. The pipe bridge footings may be located within the streambank, resulting in a small but permanent loss of habitat. Construction could result in erosion and sedimentation in the creek channel. These are potentially significant impacts.

Construction across Wildcat Creek would be carried out using jack and bore construction, with no impact on jurisdictional waters. Construction across all other drainages would be using trenching construction across culverts. Construction at these locations has the potential to result in erosion, sedimentation or discharge of pollutants in these jurisdictional waters. Impacts on jurisdictional waters in these drainages could be potentially significant. The following permits are required for riparian and jurisdictional waters for the Project:

| Agency | Permit/Approval | Pipeline Segment |
|---|---|---|
| California Department of Fish and Wildlife | Streambed Alteration Agreement | Central Pressure Zone Pipeline (Richmond/ San Pablo) |
| California Regional Water Quality Control Board | National Pollution Discharge Elimination System Construction General Permit | All pipelines |
| California Regional Water Quality Control Board | Waste Discharge Requirements for dewatering and work within the bed and banks of waters of the State | Central Pressure Zone Pipeline (Richmond/ San Pablo) |

Compliance with permit conditions, including preparation of a required Spill Prevention Plan, and implementation of Mitigation Measures HYD-1 (Schedule Construction near Harwood, Wildcat and San Pablo Creeks during Dry Season), BIO-1b (Riparian Protection Measures) and BIO-1d (Riparian Restoration Measures) would reduce the potential impact to *less than significant*.

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**Impact 3.4-4: The proposed Project could have a substantial adverse effect on resident trout and other native fishes during construction, either by impeding movement or adversely affecting aquatic habitat (Central Pressure Zone Pipeline [Richmond/San Pablo]).**

Construction at Wildcat Creek would not impede fish movement because the pipeline crossing would be via tunneling. The pipe bridge crossing of San Pablo Creek would not impede movement of fishes because all construction activity would be at the top of the streambank. All other creek crossings are culverted within the project area. However, without proper precautions construction at all creek crossings could result in direct discharges to the creeks with resulting degradation of aquatic habitat, a potentially significant impact.

Implementation of HYD-1 (Schedule Construction near Harwood, Wildcat and San Pablo Creeks during Dry Season); compliance with the Construction General Stormwater Permit (including preparation of a SWPPP); compliance with Contra Costa County Flood Control and Water Conservation District requirements for construction near Wildcat Creek and San Pablo Creek; and BMPs as required would reduce the impact to *less than significant*.

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**Impact 3.4-5: The proposed Project could have a substantial adverse effect on wildlife corridors or wildlife nursery sites during construction (Central Pressure Zone Pipeline [Richmond/San Pablo]).**

The only recognized wildlife corridors and potential wildlife nursery sites within the project area are Wildcat Creek and San Pablo Creek. Wildcat Creek would be crossed by tunneling, and construction activities would not be expected to substantially disrupt the movement of wildlife through the area. Although activity in the jack and bore pits would be less than 100 feet from the streambank of Wildcat Creek, the Project is immediately adjacent to a busy street (23rd Street) and construction activity would be limited to the daytime and would last for about 10 weeks. As a result, construction of the pipe tunnel under Wildcat Creek would have a *less-than-significant* impact on wildlife corridors and wildlife nursery sites.

The proposed Project would be located at the top of bank of San Pablo Creek, and construction would last for a total of less than three weeks. This relatively brief period of activity, also limited to the daytime, would have a *less-than-significant* impact on wildlife movement corridors and wildlife nursery areas.

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**Impact 3.4-6: Construction activities associated with the proposed Project could conflict with local policies or ordinances protecting biological resources (applies to all pipelines).**

The City of Berkeley General Plan policies call for maintaining, enhancing and preserving street and park trees to improve the environment and improve habitat, and using native tree and plant species to enhance ecological richness. The removal of two trees at Upland Park is an unavoidable impact, but implementation of Mitigation Measure AES-2 calls for the replacement of urban and park trees with the same species (if non-invasive) or appropriate native species. No large coast live oaks would be removed as part of the proposed Project.

The City of El Cerrito General Plan policies call for preservation of riparian vegetation, creeks, wildlife corridors and other wildlife habitat, and protection of special-status species. In El Cerrito the Project does not propose to impact and creek or riparian habitat, or identified habitat for any special-status species. Therefore, the Project would have a *less-than-significant* impact with respect to El Cerrito policies and ordinances.

The City of Richmond conservation and natural resources general plan policies call for protection of natural habitat, restoration of urban creeks, minimizing soil erosion, and protection of tree resources. In Richmond the Project does not propose to impact and creek or riparian habitat, or identified habitat for any special-status species. Therefore, the Project would have a *less-than-significant* impact with respect to Richmond policies and ordinances.

The City of San Pablo General Plan calls for protection and enhancement of creek systems and rare and endangered species and their habitats; protection of sensitive habitats and special-status species; preconstruction surveys for tree removal from February 1 to August 31, and preconstruction surveys prior to demolition of vacant buildings; and ensuring both access and ecological functionality of the creek system in San Pablo. Without proper protections, the proposed Project could significantly impact creek systems and the rare and endangered species that depend on them. The proposed tree removal would occur during the specified time, consistent with San Pablo General Plan policies. Implementation of Mitigation Measures BIO-1 a-d, which includes pre-construction surveys, riparian protection and restoration measures would bring the proposed Project into compliance with City of San Pablo General Plan policies.

The proposed Project would be consistent with the Wildcat Creek Restoration Action Plan in that the proposed Project would use jack and bore construction to cross Wildcat Creek, resulting in no impact on the creek and its riparian habitat.

With implementation of Mitigation Measures AES-2 and BIO-1 a-d, the Project would not conflict with local policies or ordinances related to biological resources. Therefore, the impact of the proposed Project would be reduced to *less than significant*.

**Impact 3.4-7: The proposed Project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan (applies to all pipelines).**

The project area is not included within the identified boundaries of any Habitat Conservation Plan, Natural Community Conservation plan, or local, regional or state habitat conservation plan. Therefore, the Project would have *no impact* on the provisions of any approved conservation plan.

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# 3.5 Cultural Resources

Cultural resources include historical resources, unique archaeological resources, paleontological resources, and human remains. This section evaluates the potential for the proposed Project to result in substantial adverse effects on these resources. Mitigation measures to reduce impacts to a *less than significant* level are identified, where appropriate.

## 3.5.1 Setting

### Paleontological Setting

Paleontological resources are the fossilized remains of plants and animals, including vertebrates (animals with backbones), invertebrates (e.g., starfish, clams, ammonites, and marine coral), and fossils of microscopic plants and animals (microfossils). The age and abundance of fossils depend on the location, topographic setting, and particular geologic formation in which they are found. Fossil discoveries not only provide a historical record of past plant and animal life but can assist geologists in dating rock formations. Fossil discoveries can expand our understanding of the time periods and the geographic range of existing and extinct flora and fauna.

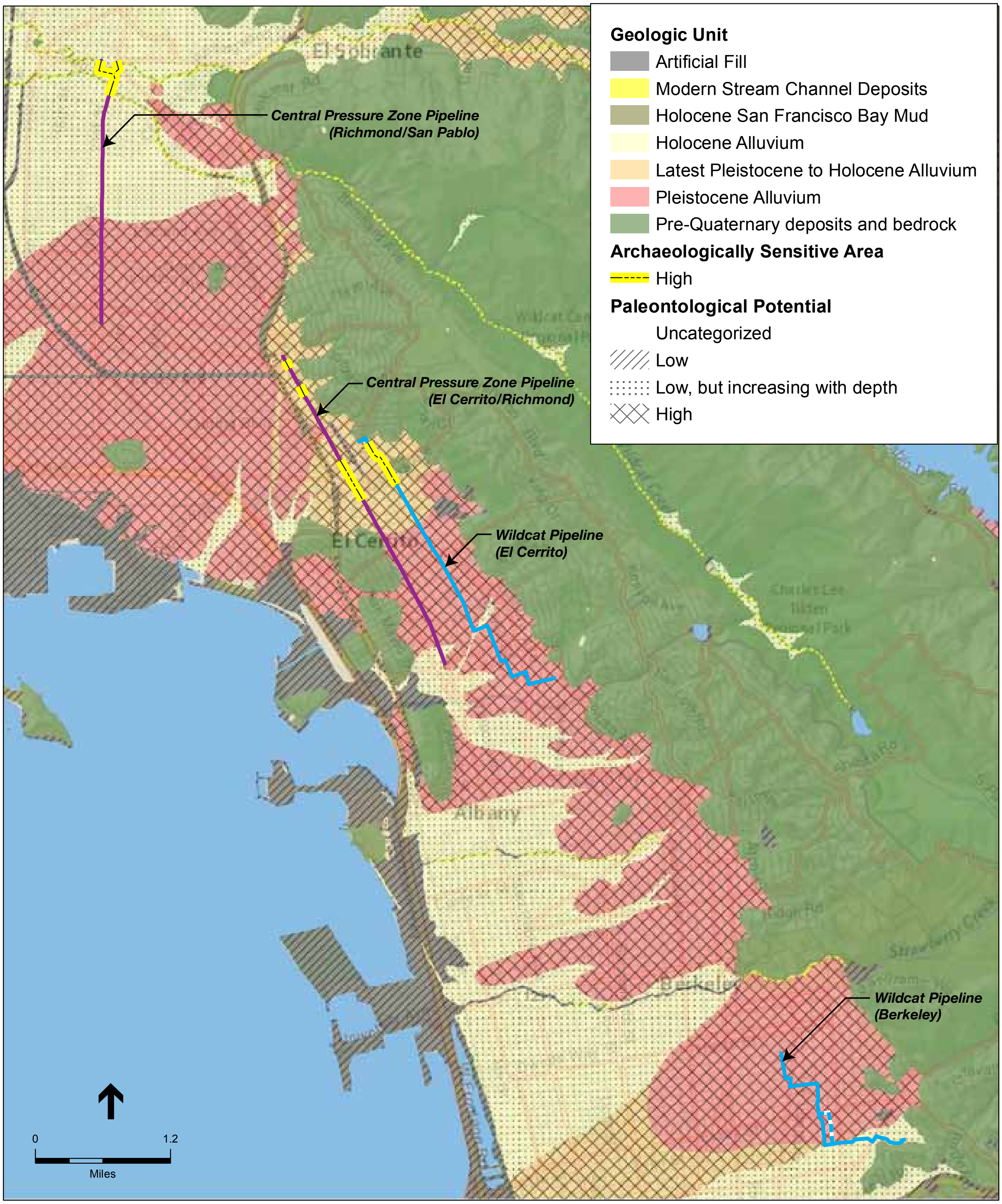
#### *Geological Context*

To determine the geologic units underlying the project area, the project study area was overlain onto a digital map of quaternary deposits in the Central San Francisco Bay Region (USGS, 2006). The geologic units underlying the study area are shown in **Figure 3.5-1** and described in **Table 3.5-1**.

The project area is predominantly underlain by Quaternary-age alluvium or alluvial fans associated with the major drainages in the area. These are predominantly flat-lying unconsolidated to moderately consolidated deposits of sand, silt, gravel and cobbles that have been carried by creeks from the hills to the east. Typically, these deposits are coarse-grained close to the base of mountains and near the head of alluvial fans (i.e., they contain more gravel and sand), whereas Quaternary-age alluvium closer to the bay margins tend to contain more silt and mud.

#### *Paleontological Assessment Guidelines*

The Society of Vertebrate Paleontology (SVP) established guidelines for the identification, assessment, and mitigation of adverse impacts on nonrenewable paleontological resources (SVP, 1995). Most practicing paleontologists in the United States adhere closely to the SVP’s assessment, mitigation, and monitoring requirements as outlined in these guidelines, which were approved through a consensus of professional paleontologists. Many federal, state, county, and city agencies have either formally or informally adopted the SVP’s standard guidelines for the mitigation of adverse construction-related impacts on paleontological resources. The SVP has helped define the value of paleontological resources and, in particular, indicates that geologic units of *high* paleontological potential are those from which vertebrate or significant invertebrate




SOURCE: USGS, 2006; CDMG, 2001

EBMUD West of Hills Northern Pipelines . D211488

**Figure 3.5-1**
Paleontological Potential and Archaeologically Sensitive Areas

**TABLE 3.5-1**
**GEOLOGICAL UNITS UNDERLYING THE PROJECT AREA**

| Geologic Unit | Age/Epoch | Description | Location |
|---|---|---|---|
| Artificial Fills | Modern | Deposits of sand, silt and gravel resulting from urban development, including construction of building foundations, utility lines and transportation infrastructure. Includes compacted engineered and noncompacted nonengineered fill. Artificial fills are not shown underlying the proposed Project alignments due to the coarse scale of the geologic source map; however, fills and/or disturbed soils of variable thickness underlie virtually all of the urbanized Bay Area. | Variable thickness across the whole study area. |
| Modern Stream Channel Deposits | Modern | Unconsolidated gravel, sand and silt in active or recently active streambeds; chiefly stream deposited, but includes some debris-flow deposits. | Underlying and immediately adjacent to stream crossings, including San Pablo and Wildcat Creeks. |
| Holocene Alluvium | Holocene | Unconsolidated bouldery, cobbley, gravelly, sandy, or silty alluvial deposits on active and recently active alluvial fans. | Northern half of the Central Pressure Zone Pipeline (Richmond/San Pablo), and the southeastern third of the Wildcat Pipeline (Berkeley) |
| Late Pleistocene to Holocene Alluvium | Holocene and late Pleistocene | Poorly consolidated gravel, sand and silt near mountain fronts; deposited chiefly from flooding streams and debris flows; surfaces can show slight to moderate soil development. | Northern half of the Central Pressure Zone Pipeline (El Cerrito/Richmond) and northern third of the Wildcat Pipeline (El Cerrito) |
| Pleistocene Alluvium | Pleistocene | Slightly to moderately consolidated silt, sand and gravel deposits on alluvial fans; surfaces dissected in varying degrees; surfaces can show moderately to well-developed soils. | Southern half of the Central Pressure Zone Pipeline (Richmond/San Pablo), southern half of the Central Pressure Zone Pipeline (El Cerrito/Richmond), southern two-thirds of the Wildcat Pipeline (El Cerrito)and the northern two-thirds of the Wildcat Pipeline (Berkeley) |
| Franciscan Complex bedrock | Jurassic to Upper Cretaceous | Sheared sedimentary and metamorphic rock with zones and blocks of chert, hard graywacke and shale, greenstone, basalt and chert, melange of metamorphic rocks including glaucophane and other schistose rocks in sheared sandstone and shale matrix, and sandstone. | Underlying all portions of the pipelines at great depths, shallowing with proximity to surface outcrops (i.e., hills). *Mapped as Pre-Quaternary deposits and bedrock.* |

SOURCE: USGS, 2006

or plant fossils have been recovered in the past (i.e., are represented in institutional collections). Only invertebrate fossils that provide new information on existing flora or fauna or on the age of a rock unit would be considered significant. Geologic units of *low* paleontological potential are those that are not known to have produced a substantial body of significant paleontological material. As such, the sensitivity of an area with respect to paleontological resources hinges on its geologic setting and whether significant fossils have been discovered in the area or in similar geologic units.

The SVP further states the following:

- Vertebrate fossils and fossiliferous deposits are considered significant nonrenewable paleontological resources, and are afforded protection by federal, state, and local environmental laws and guidelines.
- A paleontological resource is considered to be older than recorded history or 5,000 years before present and should not be confused with archaeological resource sites.
- Invertebrate fossils are not significant paleontological resources, unless they are present with an assemblage of vertebrate fossils or they provide undiscovered information on the origin and character of the plant species, past climatic conditions or the age of the rock unit itself.
- Certain plant or invertebrate fossils may be designated as significant by a project paleontologist, special interest group, lead agency or local government.

With these principles, the SVP has outlined criteria for screening the paleontological potential of rock units and established assessment and mitigation procedures tailored to such potential (SVP, 1995; SVP, 1996). **Table 3.5-2** lists the criteria for high-potential, undetermined, and low-potential rock units.

**TABLE 3.5-2**
**PALEONTOLOGICAL POTENTIAL CRITERIA**

| Paleontological Potential | Description |
|---|---|
| High | Geologic units from which vertebrate or significant invertebrate or plant fossils have been recovered in the past, or rock formations that would be lithologically and temporally suitable for the preservation of fossils. Only invertebrate fossils that provide new information on existing flora or fauna or on the age of a rock unit would be considered significant. |
| Undetermined | Geologic units for which little to no information is available. |
| Low | Geologic units that are not known to have produced a substantial body of significant paleontological material, as demonstrated by paleontological literature and prior field surveys, and which are poorly represented in institutional collections. |

SOURCE: SVP, 1995.

It is important to note that while paleontological potential as defined above can provide a rough idea of whether subsurface fossils may exist, it prescribes a very low threshold for identifying a rock unit as high potential. It would include most sedimentary rock units older than recent, and any other rock types (i.e., igneous or metamorphic) that have yielded a vertebrate or significant invertebrate or plant fossils anywhere within their geographic extents. This low threshold is reasonable; however, being buried resources, the uniqueness or significance of a fossil locality is unknown until it is identified to a reasonably precise level (Scott and Springer, 2004; 5). As such, any fossil discovery should be treated as potentially unique or significant until determined otherwise by a professional paleontologist.

## Paleontological Resources Potential

A search of the paleontological locality database of the University of California Museum of Paleontology was conducted to identify vertebrate fossil localities within Alameda and Contra Costa Counties (UCMP, 2012). The records search did not identify existing fossil localities that directly intersect the proposed pipeline alignments. However, the records search revealed several fossil localities in the broader region that were discovered within the same or similar geologic units that could be encountered by the proposed Project. As summarized in **Table 3.5-3**, numerous fossils have been discovered within older (generally Pleistocene-age) alluvial fan deposits and alluvium. The most common geologic unit represented in UCMP collections was Tertiary-age sedimentary rock formations, which do not underlie the project area. In accordance with SVP criteria for assigning paleontological potential ratings to rock units (see Table 3.5-3), both Pleistocene Alluvium and Early Pleistocene to Holocene Alluvium would have a high paleontological potential because vertebrate fossils have been recovered from them in the past.

**TABLE 3.5-3**
**PALEONTOLOGICAL POTENTIAL OF THE GEOLOGIC UNITS UNDERLYING THE STUDY AREA**

| Geologic Unit | Vertebrate Fossil Localities | Fossil Type/Species | Paleontological Potential |
|---|---|---|---|
| Artificial Fills | None | N/A | Low (but increasing at depth) |
| Modern Stream Channel Deposits | None | N/A | Low (but increasing at depth) |
| Holocene Alluvium | None | N/A | Low (but increasing at depth) |
| Latest Pleistocene to Holocene Alluvium AND Pleistocene Alluvium | 62 fossil localities in Contra Costa County and 65 vertebrate fossil localities in Alameda County | Camels, horses, bison, mammoth, mastodons and numerous other hoofed vertebrates | High |

SOURCE: UCMP, 2012

According to SVP criteria, all other units shown in Table 3.5-3, including artificial fills, younger alluvium and alluvial fan deposits, and granitic rocks would have a low paleontological resource potential because they have not yielded fossils in the past. However, because artificial fills and younger alluvium are geologic units that are often underlain within other geologic units with high paleontological potential, it must be recognized that deeper excavations within these units could encounter sensitive geologic units. While the geology mapped at the surface consisted of younger alluvium of low paleontological potential, excavations eventually encountered older alluvium containing numerous vertebrate fossils of significance.

The paleontological potential of the geologic units underlying the project area is shown on Figure 3.5-1, with the crosshatch pattern indicating areas of high paleontological potential. Based on these assumptions about geological mapping, the majority of the pipeline alignments are potentially sensitive with respect to paleontological resources. This includes the northern half of the Central Pressure Zone Pipeline (El Cerrito/Richmond), the entirety of the Central Pressure Zone

Pipeline (Richmond/San Pablo) and Wildcat Pipeline (El Cerrito), and the northern two thirds of the Wildcat Pipeline (Berkeley). As discussed above, other areas underlain by younger alluvium, especially those in close proximity to surface exposures of older alluvium or tertiary sedimentary rocks, may be underlain by paleontologically sensitive units.

## Archaeological and Historic Setting

### *Geoarchaeological Setting and Discussion*

The San Francisco Bay Area has undergone dramatic landscape changes since humans began to inhabit the region more than 10,000 years ago. Rising sea levels and increased sedimentation into streams and rivers are among some of the changes (Helley and Graymer, 1979). In many places, the interface between older land surfaces and alluvial fans are marked by a well-developed buried soil profile, or a paleosol. A paleosol is formed from weathering at or near the ground surface during a period of comparative landform stability. This surface would also have been available for human occupation and use prior to subsequent sediment deposition. Paleosols preserve the composition and character of the earth’s surface prior to subsequent sediment deposition; thus, paleosols have the potential to preserve archeological resources if the area was occupied or settled by humans (Meyer and Rosenthal, 2007). Because human populations have grown since the arrival of the area’s first inhabitants, younger paleosols (late Holocene, or from approximately 2000 B.C.) are more likely to yield archaeological resources than older paleosols (early Holocene or Pleistocene, or from approximately 12,000 B.C.). Numerous archaeological sites in the Bay Area have been found in this context, including one in the vicinity of the proposed Project. Site CA-CCO-243 is located 1,200 feet from the proposed Central Pressure Zone Pipeline (Richmond/San Pablo). The site was found in association with a late Holocene paleosol buried beneath 6 feet of alluvial fill.

The project area is primarily mapped as Holocene and Pleistocene alluvial deposits. The northern half of the Central Pressure Zone Pipeline (Richmond/San Pablo) alignment extends through Holocene alluvial deposits. Additionally, portions of the Central Pressure Zone Pipeline (El Cerrito/Richmond) and the Wildcat Pipeline (El Cerrito) extend through an area mapped as Latest Pleistocene to Holocene alluvium. The Wildcat Pipeline (Berkeley) extends primarily through an area mapped as Pleistocene alluvium with a segment extending east/west through Holocene alluvium.

While areas of Holocene-age alluvial deposits may contain buried surfaces or paleosols (discussed above), archaeological sites generally occur in specific environmental settings, including level (or flat) areas near present or former water courses such as perennial streams. Therefore, for the purpose of this study, the potential for buried archaeological sites was based on the relative age of geologic formations as well as the location of level areas in the vicinity of present or former water courses. Using these assumptions, five locations in the project area have been determined to have a high sensitivity for buried prehistoric archaeological resources (Koenig and Brewster, 2011). These locations are shown on Figure 3.5-1.

### *Prehistoric Context*

Categorizing the prehistoric period into broad cultural stages allows researchers to describe a broad range of archaeological resources with similar cultural patterns and components during a given time frame, thereby creating a regional chronology. This section provides a brief discussion of the prehistoric chronology for the project area.

A framework for the interpretation of the San Francisco Bay Area is provided by Milliken et al. (2007), who have divided human history in the San Francisco Bay Area into four broad periods: the *Paleoindian Period* (11,500–8000 B.C.), the *Early Period* (8000–500 B.C.), the *Middle Period* (500 B.C.–A.D. 1050), and the *Late Period* (A.D. 1050–1550). Economic patterns, stylistic aspects, and regional phases further subdivide cultural patterns into shorter phases. This scheme uses economic and technological types, socio-politics, trade networks, population density, and variations of artifact types to differentiate between cultural periods.

The *Paleoindian Period* (11,500–8000 B.C.) was characterized by big-game hunters occupying broad geographic areas. Evidence of human habitation during the *Paleoindian Period* has not yet been discovered in the San Francisco Bay Area. During the *Early Holocene* (*Lower Archaic*, 8000–3500 B.C.), geographic mobility continued from the *Paleoindian Period* and is characterized by the millingslab and handstone as well as large wide-stemmed and leaf-shaped projectile points. The first cut shell beads and the mortar and pestle are first documented in burials during the *Early Period* (*Middle Archaic*, 3500–500 B.C.), indicating the beginning of a shift from nomadic lifestyle to a society which remains in once place. During the *Middle Period*, which includes the *Lower Middle Period* (*Initial Upper Archaic*, 500 B.C.–A.D. 430), and *Upper Middle Period* (*Late Upper Archaic*, A.D. 430–1050), geographic mobility may have continued, although groups began to establish longer term base camps in localities from which a more diverse range of resources could be exploited. The first rich black middens are recorded from this period. The addition of milling tools, obsidian (naturally occurring volcanic glass) and chert concave-base projectile points, as well as the occurrence of sites in a wider range of environments, suggest that the economic base was more diverse. By the *Upper Middle Period*, mobility was being replaced by the development of numerous small villages. Around A.D. 430, a “dramatic cultural disruption” occurred as evidenced by the sudden collapse of the Olivella saucer bead trade network. During the *Initial Late Period* (*Lower Emergent*, A.D. 1050–1550), social complexity developed toward lifeways of large, central villages with resident political leaders and specialized activity sites. Artifacts associated with the period include the bow and arrow, small corner-notched projectile points, and a diversity of beads and ornaments.

### *Ethnographic Background*

Before Euroamerican contact, the area of present-day Contra Costa and Alameda Counties was occupied by the *Ohlone* (also known by their linguistic group, *Costanoan*). Politically, the Ohlone were organized into groups called tribelets. A tribelet constituted a sovereign entity that held a defined territory and exercised control over its resources. It was also a unit of linguistic and ethnic differentiation. Richmond, El Cerrito, and Berkeley, as well as a large part of the East Bay, are located within the territory of the *Huchiun* people, who spoke the Chochenyo dialect (Levy, 1978; Moratto, 1984).

The Ohlone economy was based on fishing, gathering, and hunting, with the land and waters providing a diversity of resources, including acorns, various seeds, salmon, deer, rabbits, insects, and quail. The acorn was the most important dietary staple of the Ohlone. The acorns were ground to produce a meal that was leached to remove the bitter tannin. Technologically, the Ohlone crafted tule balsa (canoe), basketry, lithics (stone tools) such as mortars and metates (a mortar-like flat bowl used for grinding grain), and household utensils. The Ohlone, like many other Native American groups in the Bay Area, likely lived in conical tule thatch houses.

In 1770, the Costanoan-speaking people lived in approximately 50 separate and politically autonomous nations or tribelets, and the number of Chochenyo speakers reached 2,000, substantially more than the typical size of a tribelet, which ranged from 40 to 200 members.

During the Mission Period (1770–1835), native populations, especially along the California coast, were brought—usually by force—to the missions by the Spanish missionaries to provide labor. The missionization caused the Ohlone people to experience cataclysmic changes in almost all areas of their life, particularly a massive decline in population caused by introduced diseases and declining birth rate, resulting in large part from colonization by the Spanish missionaries. Following the secularization of the missions by the Mexican government in the 1830s, most Native Americans gradually left the missions and established rancherias in the surrounding areas.

### Historic Background

The first Europeans to visit the East Bay area were the Spanish explorers Pedro Fages and Reverend Juan Crespi, who passed through in 1772. After Mexico won independence from Spain in 1821, large tracts of land in California were granted to military heroes and loyalists. In 1823, Don Francisco Castro was given 17,000 acres of land in Contra Costa County, which became known as Rancho San Pablo. Castro used the property to graze large herds of roving cattle and establish fruit orchards and grape vineyards. The discovery of gold in 1848 led to a huge population boom in California, with settlers establishing themselves on parcels of Rancho San Pablo, eventually dwindling the original estate to a few acres surrounding the original adobe (Hoover, 2002). The 1851 California Land Claims Act required Mexican landowners in California to prove the validity of their claim on land held under Mexican titles. Lands under rejected claims were deemed public and available for arriving settlers. As the average length of time required to prove ownership was 17 years after submitting a claim, many landowners were bankrupted and forced to sell large portions of their land to the settlers they had been attempting to evict (Rawls and Bean, 2002).

From 1820 on, “El Cerrito” is referred to in the records as Cerrito de San Antonio, now Albany Hill. Until the turn of the century, however, the vicinity of what is now Richmond and El Cerrito consisted mostly of cattle grazing lands. El Cerrito was originally established as the community of Rust by refugees from the San Francisco earthquake in 1906. In 1917, the community, with a population of 1,500, decided to incorporate and changed its name to El Cerrito (Gudde, 1998).

Richmond incorporated in 1905, with a population of 2,150. The area was already an established industrial town from its connection with Point Richmond and the Santa Fe Railroad's western terminus at Point Richmond. Within a few years of incorporation, several industries relocated to Richmond and town sites began to emerge around these industries.

The first telegraph line was put up in 1861 and ran from Oakland down what is now Telegraph Avenue and Claremont Avenue. As the line continued northward, development continued along its path. The first house in what would become Berkeley was built in 1865 by Samuel Willey. Berkeley became firmly established with the creation of the new University of California at Berkeley in 1873. One original building, South Hall, is still standing (Hoover et al., 2002:23).

San Pablo Avenue is one of the oldest existing roads in the East Bay. The road was established during the Spanish Period as the Camino de la Contra Costa ("road of the opposite shore"). Legally the road was a "camino real," or a royal road that was the property of the Spanish crown. The road was the principal access road for the numerous ranches in this part of the East Bay. In 1852, the Court of Sessions of Contra Costa County ordered the construction of a more direct and improved road along the same route between Oakland and Rancho San Pablo, which became known as "The San Pablo Road." In the early part of the 20th century, a streetcar line ran on San Pablo Avenue between Richmond and Oakland. In 1927, the road was designated as part of the Lincoln Highway, the nation's first transcontinental road (Hoover et al., 2002:24). San Pablo Avenue is also a segment of the Juan Bautista de Anza National Historic Trail, which begins in Arizona and the U.S.-Mexican border and ends in San Francisco.

## Historical and Archaeological Resource Potential

### *Records Search and Literature Review*

ESA Cultural Resources staff conducted a records search at the Northwest Information Center (NWIC) of the California Historical Resources Information System at Sonoma State University on March 6, 2012 (File No. 11-0971). Records were accessed by reviewing the Richmond, Briones Valley, Oakland West, and Oakland East, California 7.5-minute quadrangle base maps. Additional research was conducted using the files and literature at ESA. The records search included a quarter-mile radius around the proposed Project in order to: (1) determine whether known cultural resources had been recorded within or adjacent to the project area; (2) assess the likelihood of unrecorded cultural resources based on historical references and the distribution of environmental settings of nearby sites; and (3) develop a context for identification and preliminary evaluation of cultural resources. Included in the review was the Historic Properties Directory (HPD) listing for Alameda and Contra Costa Counties (August 2011). The HPD includes listings of the National Register and the California Register, and the most recent listings of the California Historical Landmarks and California Points of Historical Interest. Historic-period topographic maps and historic aerials were also reviewed.

The records search at the NWIC indicated that 23 cultural resources investigations have been previously conducted within or immediately adjacent to the project area. Thirteen cultural resources have been previously recorded within a quarter-mile radius of the project area. Two of the thirteen cultural resources (CA-CCO-432 and CA-CCO-758) have been previously recorded immediately adjacent to the project area. Six resources are located within the records search radius of the Central Pressure Zone Pipeline (Richmond/San Pablo). Seven resources are located within the records search radius of the Central Pressure Zone Pipeline (El Cerrito/Richmond) and the Wildcat Pipeline (El Cerrito). No resources have been previously recorded in relation to the Wildcat Pipeline (Berkeley). The thirteen resources are listed in **Table 3.5-4**, below.

**TABLE 3.5-4**
**CULTURAL RESOURCES WITHIN THE ¼-MILE RECORDS SEARCH RADIUS**

| Trinomial | Primary No. | Site Type | Previous National Register-eligibility Status |
|---|---|---|---|
| CA-CCO-127 | P-07-000069 | Prehistoric shell midden | Not evaluated |
| CA-CCO-132 | P-07-000074 | Prehistoric shell midden / occupation site | Not evaluated |
| CA-CCO-152 | P-07-000094 | Bedrock outcrop with prehistoric milling features / petroglyphs | Not evaluated |
| CA-CCO-243 | P-07-000125 | Prehistoric midden with human remains (deeply buried site) | Not evaluated |
| CA-CCO-271 | P-07-000150 | Large prehistoric shell midden with human remains and numerous artifacts | Contributor to the Lower San Pablo Creek Archaeological District |
| CA-CCO-272 | P-07-000151 | Large prehistoric shell midden with human remains and numerous artifacts | Not evaluated |
| CA-CCO-357 | P-07-000466 | Prehistoric shell midden | Not evaluated |
| CA-CCO-432 | P-07-000456 | Prehistoric shell midden | Not evaluated |
| CA-CCO-757H | P-07-002599 | Rail bed of the Oakland local branch of the Atchison, Topeka, and Santa Fe Railroad | Not evaluated |
| CA-CCO-758 | P-07-002600 | Prehistoric shell midden | Not evaluated |
| None | P-07-002581 | Bedrock outcrop with prehistoric milling features | Not evaluated |
| None | P-07-003064 | Imported prehistoric shell mound materials | Not evaluated |
| None | P-07-003065 | Prehistoric shell midden | Not evaluated |

A search of the Historic Property Directory for Alameda and Contra Costa Counties indicates that no buildings located along the Project alignments are listed in or eligible for listing in the National and/or California registers. The windshield survey identified buildings adjacent to the pipeline alignments that appear to have been constructed more than 50 years ago, and as such, could qualify as historical resources if other criteria apply; however none were identified as being a historic resource.

### *Survey Methods and Findings*

A mixed strategy survey of the proposed alignments was conducted on March 18, 2012 (Koenig, 2012). A pedestrian survey was conducted of areas adjacent to or along the alignments where the ground surface was exposed. A cursory “windshield” survey, combined with the pedestrian survey, was conducted in areas with limited exposed ground surface. The intensity of the survey was determined by environmental conditions (i.e., paved, unpaved, disturbed, vegetation limitations), and the predicted archaeological sensitivity of the area was based on several factors, including the results of previous surveys; mapped locations of previously recorded sites; and proximity to modern and historic waterways and to other geographic features, such as ridgelines, marshland, and types of geologic formations. Before fieldwork ensued, aerial, topographic, and geologic maps of the project area were examined to determine where more intensive pedestrian survey was warranted.

Approximately 98 percent of the pipeline alignments would be installed within paved road right-of-ways all with significant presence of other underground utilities. Urban, paved areas with concrete gutters and sidewalks exhibiting no ground surface exposure were subject to windshield survey to identify areas that exhibited some ground visibility (e.g., vacant lots, planter boxes, residential landscaped areas). Project areas located within a 500-foot radius of previously recorded sites were examined on-foot at close transect intervals to determine whether cultural constituents of those sites extend into the project area. Areas determined to be culturally sensitive based on potential for former land surfaces and water courses were also examined on-foot at close transect intervals. Types of soil observed included light to medium brown sandy loam, as well as imported fills and gravels. Encountered cultural resources were recorded following the standards of the California Department of Parks and Recreation (DPR). All resources were photographed and plotted on a USGS 7.5-minute topographic quadrangle.

#### Architectural and Historic-period Archaeological Findings

No potentially significant railroads, bridges, or other structures that could be considered historical resources were identified in the pipeline alignment areas during the windshield survey. The majority of the pipeline will be installed and buried in paved road right-of-ways and no project-related direct impacts on adjacent buildings or structures would occur. Pipeline installation is not expected to exceed the construction vibration damage threshold for buildings extremely susceptible to vibration damage, including any historic architectural resources that may exist near to but outside of the public right-of-way alignments. Additionally there are no proposed above-ground components associated with the proposed Project that would indirectly impact the viewshed of any nearby historical resources and/or historic properties. For these reasons, no intensive-level historic architectural field surveys were conducted outside of the public rights-of-way.

Based on a review of historic maps and aerials, the project area is primarily located in paved roadways that were established during historic development. There is no indication that historic-period archaeological resources (including artifact-filled wells and privies or foundations of stone, adobe, or brick) are located within the project area. A previous study for a portion of San Pablo Avenue within the Central Pressure Zone Pipeline (El Cerrito/Richmond) project area determined that it is “very unlikely” that historic-period cultural resources, such as archaeological sites, structures, objects, or building remains, are located within the current San Pablo Avenue right-of-way (Praetzellis and Praetzellis, 1986).

The Central Pressure Zone Pipeline (El Cerrito/Richmond) follows the historic route of San Pablo Avenue. San Pablo Avenue is the historic alignment of the Juan Bautista de Anza Trail and is considered a historical resource for the purposes of CEQA. As San Pablo Avenue/Juan Bautista de Anza Trail in the project area is comprised entirely of modern roadway materials, it is the original alignment of this road that is considered the primary character-defining feature of this historical resource.

### Geoarchaeological Assessment and Prehistoric Archaeological Findings

As described in the Geological Setting and Discussion above, five locations along the project area have been determined to be sensitive areas for deeply buried prehistoric cultural resources. While these locations were surveyed intensively for any surface evidence of archaeological resources, surface survey is not productive in locating buried surfaces with potential for associated archaeological resources.

The surface survey resulted in the location of two previously recorded archaeological sites (CA-CCO-432 and CA-CCO-758), and the identification of two new potential archaeological resources (temporarily designated WOH-01 and WOH-02). All four sites consist of dark midden soil with shell fragments, indicative of San Francisco Bay Area prehistoric archaeological sites. The sites are located in planter beds and landscaped areas immediately adjacent to the paved roadways. Because pavement obscures the project area, it is not known whether the archaeological sites extend below the pavement into areas that would be subject to ground-disturbing activities from the pipeline installation.

Site **CA-CCO-432** was found in the location of the original recording (Banks, 1980). The site is adjacent to the proposed Central Pressure Zone Pipeline (Richmond/San Pablo) alignment. Since the 1980 recordation, a tall iron fence has been installed around the residence where the site is located limiting access to any exposed soils. Dark midden soil and a few shell fragments were observed behind the fence. As noted on the original site record, it is not clear whether the midden has been redeposited from elsewhere or is representative of an intact deposit. Surface evidence cannot determine whether the site extends below the pavement into the project area.

Site **CA-CCO-758** was found adjacent to the proposed Central Pressure Zone Pipeline (El Cerrito/Richmond) alignment. Small marine shell fragments in a soil matrix of mixed dark soils and sand was observed in five cement planter boxes, as described in the 2003 site record (Kelley et al., 2003). No other artifacts or features were observed. As noted on the original site record, it is not clear whether the soils and shell may be part of or redeposited from CA-CCO-127, a large prehistoric site located to the east. It also cannot be determined, based on surface evidence, whether the site extends below the pavement into the project area.

A newly recorded resource, temporarily designated **WOH-01**, consists of dark midden soils containing a few small shell fragments, fish bone, and faunal bone located in the landscaped garden of a residence adjacent to the proposed Wildcat Pipeline (El Cerrito) alignment. This location had been identified prior to surveying as a highly sensitive area for prehistoric archaeological resources based on historic landforms and waterway features. The faunal bone observed appeared to have been saw-cut, suggesting the site may be historic or modern in nature, rather than prehistoric. Whether the resource extends into the project area could not be determined owing to the presence of pavement.

Another newly recorded resource, temporarily designated **WOH-02**, consists of dark midden soils and two small marine shell fragments located in the unpaved sidewalk planter adjacent to the proposed Central Pressure Zone Pipeline (El Cerrito/Richmond) alignment. This location was identified prior to surveying as a highly sensitive area for prehistoric cultural resources, based on historic landforms and waterway features. Vegetation was scraped back with a trowel; no other cultural materials were identified. It is not clear whether the midden and shell fragments constitute an intact archaeological deposit or have been redeposited as fill from another location. The existing pavement makes it impossible to visually determine whether the dark soils extend into the project area.

# 3.5.2 Regulatory Setting

Numerous laws and regulations require federal, state, and local agencies to consider the effects a project may have on cultural resources. These laws and regulations stipulate a process for compliance, define the responsibilities of the various agencies proposing the action, and prescribe the relationship among other involved agencies (e.g., the Office of Historic Preservation (OHP) and the Advisory Council on Historic Preservation). The National Historic Preservation Act (NHPA), as amended; the California Register; Public Resources Code (PRC) Section 5024; and CEQA; are the primary federal and state laws governing and affecting preservation of cultural resources of national, state, regional, and local significance. The applicable regulations for the proposed Project are discussed below.

## Federal Regulations

### *National Register of Historic Places*

The National Register was established by the NHPA, as “an authoritative guide to be used by federal, state, and local governments, private groups and citizens to identify the Nation’s historic resources and to indicate what properties should be considered for protection from destruction or impairment” (36 CFR, Section 60.2). The National Register recognizes both historical-period and prehistoric archaeological properties that are significant at the national, state, and local levels.

To be eligible for listing in the National Register, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must meet one or more of the following four established criteria (U.S. Department of the Interior, 1990):

A. Are associated with events that have made a significant contribution to the broad patterns of our history;

B. Are associated with the lives of persons significant in our past;

C. Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. Have yielded, or may be likely to yield, information important in prehistory or history.

Unless the property possesses exceptional significance, it must be at least 50 years old to be eligible for National Register listing (U.S. Department of the Interior, 1990).

In addition to meeting the criteria of significance, a property must have integrity. Integrity is defined as "the ability of a property to convey its significance" (U.S. Department of the Interior, 1990). The National Register recognizes seven qualities that, in various combinations, define integrity. To retain historic integrity a property must possess several, and usually most, of these seven aspects. Thus, the retention of the specific aspects of integrity is paramount for a property to convey its significance. The seven factors that define integrity are location, design, setting, materials, workmanship, feeling, and association.

## State of California

### *Office of Historic Preservation*

The State of California implements the NHPA through its statewide comprehensive cultural resources surveys and preservation programs. The OHP, as an office of the California Department of Parks and Recreation, implements the policies of the NHPA on a statewide level. The OHP also maintains the California Historical Resources Inventory. The State Historic Preservation Officer (SHPO) is an appointed official who implements historic preservation programs within the state's jurisdiction.

### *California Register of Historical Resources*

The California Register is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the State and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC, Section 5024.1[a]). The criteria for eligibility for the California Register are based on National Register criteria (PRC, Section 5024.1[b]; 14 California Code of Regulations [CCR], Section 4850 et seq.). Certain resources are determined by the statute to be automatically included in the California Register, including California properties formally determined eligible for, or listed in, the National Register.

To be eligible for the California Register, a prehistoric or historic-period resource must be significant at the local, state, and/or federal level under one or more of the following four criteria. The resource:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

A resource eligible for the California Register must meet one of the criteria of significance described above, and retain enough of its historic character or appearance (integrity) to be recognizable as a historical resource and to convey the reason for its significance.

Additionally, the California Register consists of resources that are listed automatically and those that must be nominated through an application and public hearing process. The California Register automatically includes the following:

- California properties listed on the National Register and those formally Determined Eligible for the National Register;
- California Registered Historical Landmarks from No. 770 onward; and
- Those California Points of Historical Interest that have been evaluated by the OHP and have been recommended to the State Historical Commission for inclusion on the California Register.

Other resources that may be nominated to the California Register include:

- Historical resources with a significance rating of Category 3 through 5 (those properties identified as eligible for listing in the National Register, the California Register, and/or a local jurisdiction register);
- Individual historical resources;
- Historical resources contributing to historic districts; and
- Historical resources designated or listed as local landmarks, or designated under any local ordinance, such as an historic preservation overlay zone.

### *California Environmental Quality Act*

CEQA requires lead agencies to determine if a proposed Project would have a significant effect on archaeological resources. CEQA is codified in PRC Section 21000 et seq. As defined in Section 21083.2 of CEQA, a “unique” archaeological resource is an archaeological artifact, object, or site that, without merely adding to the current body of knowledge, can be clearly demonstrated to have a high probability of meeting any of the following criteria:

- Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information;
- Has a special and particular quality, such as being the oldest of its type or the best available example of its type; or
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

In addition, the CEQA Guidelines recognize that certain historical resources may also have significance. The CEQA Guidelines recognize that a historical resource includes: (1) a resource listed in, or eligible for listing in, the California Register; (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); and (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

If a lead agency determines that an archaeological site is a historical resource, the provisions of Section 21084.1 of CEQA and Section 15064.5 of the CEQA Guidelines apply. If an archaeological site does not meet the criteria for a historical resource contained in the CEQA Guidelines, then the site is to be treated in accordance with the provisions of CEQA Section 21083, as it pertains to unique archaeological resources. The CEQA Guidelines note that if an archaeological resource is neither a unique archaeological nor a historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment (CEQA Guidelines, Section 15064.5(c)(4)).

PRC Section 5024.1(f) requires a lead agency to make provisions for historical or unique archaeological resources accidentally discovered during construction. Provisions include an immediate evaluation of the find by a qualified archaeologist. Work can continue on other parts of the project site while historical or unique archaeological resource mitigation takes place.

In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, PRC Section 5024.1(e) requires that there will be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until the coroner of the county in which the remains are discovered is contacted. If the coroner determines the remains to be Native American, the coroner shall contact the Native American Heritage Commission (NAHC) within 24 hours. The NAHC shall identify the person or persons it believes to be the most likely descendant of the deceased Native American.

## Local Policies

### *Contra Costa County General Plan 2005-2020 (2005)*

The 2005 Open Space Element of the Contra Costa County General Plan 2005 – 2020 lists the following cultural resource policies applicable to the Project:

> ***Policy 9-31:*** Identify and preserve important archaeological and historic resources within the County.
>
> ***Policy 9-32:*** Areas which have identifiable and important archaeological or historic significance shall be preserved for such uses, preferably in public ownership.
>
> ***Policy 9-33:*** Buildings or structures that have visual merit and historic value shall be protected.
>
> ***Policy 9-34:*** Development surrounding areas of historic significance shall have compatible and high quality design in order to protect and enhance the historic quality of the area.

# 3.5.3 Impacts and Mitigation Measures

## Significance Criteria

For the purposes of this EIR and consistent with Appendix G of the CEQA Guidelines, the West of Hills Northern Pipelines Project is considered to have a significant impact if it would:

- Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines, Section 15064.5.
- Cause a substantial adverse change in the significance of an archaeological resource, including those determined to be a historical resource defined in Section 15064.5 or a unique archaeological resource defined in PRC 21083.2.
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.
- Disturb any human remains, including those interred outside of formal cemeteries.

## Approach to Analysis

This analysis considers direct and indirect impacts on known cultural (archaeological and architectural) and paleontological resources as well as inadvertent discoveries that could occur during construction. Generally, potential impacts on historic architectural resources are assessed by determining whether Project activities would affect any such resources that have been identified as historical resources for the purposes of CEQA. While most historic buildings and many historic-period archaeological resources are generally significant because of their association with important events, people, or styles (National and California Register Criteria A/1, B/2, and C/3), the significance of most prehistoric and historic-period archaeological resources is usually assessed under National and California Register Criterion D/4. This criterion stresses the potential for discovering important historical information within the site rather than the resource's significance as a surviving example of a type of construction or its association with an important person or event.

Once a resource has been identified as significant under one or more of the four National and/or California Register criteria, it must be determined whether the Project would "cause a substantial adverse change in the significance" of the resource (CEQA Guidelines 15064.5[b]). A substantial adverse change in the significance of a historical resource or unique archaeological resource means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be materially impaired" (CEQA Guidelines Section 15064.5[b][1]). The significance of an historical resource is materially impaired through the demolition or alteration of the resource's physical characteristics that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in, the California Register (CEQA Guidelines Section 15064.5[b][2]).

Public agencies should also, whenever feasible, seek to avoid damaging effects on any historical resource of an archaeological nature. Preservation in place is the preferred manner of mitigating impacts to archaeological sites. Preservation in place may be accomplished by, but is not limited to, planning construction to avoid archaeological sites, incorporating sites into parks or greenspace, covering or capping archaeological sites, and deeding sites into a permanent conservation easement (CEQA Guidelines Section 15126.4[b][3]).

The impact analysis for paleontological resources is based on the paleontological potential of the rock units to be disturbed by Project-related excavations.

## Impacts and Mitigation Measures

**Impact 3.5-1: Construction of the proposed Project could cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines, Section 15064.5 (applies to all pipelines).**

As discussed in Section 3.11, Noise and Vibration, proposed construction activities could result in vibration levels that have the potential to damage buildings and structures. However, this potential impact would be reduced to a *less-than-significant* level with implementation of Mitigation Measure NOI-4, Vibration Limits, which stipulates that construction practices would be utilized that do not generate vibration levels at the closest structures, including any historical resources as defined in CEQA Guidelines, Section 15064.5, above protective thresholds identified by the Federal Transit Authority (FTA, 2006). Additionally there are no historical resources and/or historic properties within the viewshed of any above-ground components associated with the proposed Project (i.e. the pipe-bridge spanning San Pablo Creek).

As noted in the Historic Background above, San Pablo Avenue is one of the oldest existing roads in the East Bay and for the purposes of CEQA is considered a historical resource. While San Pablo Avenue is a historic route for comprising both the original San Pablo Road and a segment of the Juan Bautista de Anza National Historic Trail, *no impacts* on the significance of the alignment of this road/trail segment would be caused by the installation of an underground pipeline.

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**Impact 3.5-2: Construction of the proposed Project could cause a substantial adverse change in the significance of an archaeological resource, including those determined to be a historical resource defined in Section 15064.5 or a unique archaeological resource defined in PRC 21083.2 (applies to all pipelines).**

Four archaeological sites (CA-CCO-432; CA-CCO-758; WOH-01; WOH-02) have been identified immediately adjacent to the proposed Project area as a result of the archaeological resources assessment prepared in connection with the proposed Project (Koenig, 2012). All four sites consist of dark midden soil with shell fragments, indicative of San Francisco Bay Area prehistoric archaeological sites. The sites are located in planter beds and landscaped areas immediately adjacent to the paved roadways. The existing pavement makes it impossible to visually determine whether the sites extend into the project area. Pavement presently obscures access to portions of the project area adjacent to the four identified archaeological sites and it is unknown whether the sites extend into the project area. While formal evaluation to determine whether any of the four sites qualify as eligible for listing in the National or California Registers has not been conducted, sufficient information exists to suggest that the sites may qualify as "historical resources" pursuant to CEQA Section 15064.5(a)(4) and Public Resources Code 21098.1. As such, for the purposes of the analysis in this EIR, EBMUD considers these four sites to be "historical resources."

EBMUD has considered avoidance as the preferred manner of mitigating impacts to the four archeological sites as required by CEQA Section 15126.4(b)(3) and has determined that a project re-design to avoid impacts to historical resources is not feasible. Because the proposed pipelines are located in a fully developed urban environment, the only utility corridors available are public rights-of-way and existing utility corridors. The alternative alignments discussed in Chapter 4 would all potentially impact historical resources of an archaeological nature. Because of the difficulty in determining the location of buried resources, it cannot be determined that re-routing the alignment would avoid archaeological sites. Other types of preservation in place (incorporating sites into parks or green space, covering or capping archaeological sites, and deeding sites into a permanent conservation easement) are not appropriate as the proposed alignments are below grade and wholly within existing public rights-of-way (city streets). In order to mitigate any adverse impacts to historical resources, EBMUD will implement Mitigation Measures CUL-1a through CUL-1c. Implementation of these measures would ensure that impacts would be *less than significant*.

**Mitigation Measure CUL-1a: Retain a Qualified Archaeologist.**

A qualified archaeologist meeting the Secretary of the Interior's Qualification Standard will be retained by EBMUD prior to approximately 50% design phase (when the specific location of the alignments within the roadways have been established) to carry out the cultural resources mitigation measures contained herein.

**Mitigation Measure CUL-1b: Develop an Archaeological Research Design and Treatment Plan.**

A qualified archaeologist will prepare an Archaeological Research Design and Treatment Plan (ARDTP) that addresses, at a minimum, the following: the establishment of Environmentally Sensitive Areas; treatment and recovery of important scientific data contained within the portions of the historical resources located within the project Area of Potential Effects (APE); construction worker cultural resources sensitivity training; archaeological and Native American monitoring; inadvertent discovery protocols; and provisions for curation of recovered materials. The ARDTP will address the methods for subsurface investigation at each of the four historical resources (CA-CCO-432; CA-CCO-758; WOH-01; WOH-02) to determine whether the portions of the sites located within the project APE contribute to each of the sites' overall eligibility. The subsurface investigation will seek to identify whether the portions of the sites within the APE contain important scientific data (Criterion D/4) or other archaeological materials of traditional/cultural value to Native American tribes (Criteria A/1, B/2, and C/3). The ARDTP will include the specific methods that will be employed at each site location (i.e. the length and depth of excavation, the type of equipment utilized, the percent of area investigated at each site location). The investigation may include trenching in the APE adjacent to the visible site components and may be coordinated with potholing to confirm the location of existing utilities. The ARDTP will identify how the proposed program would preserve any significant historical information obtained and will identify the scientific/historic research questions applicable to the resources, the data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. The results of the investigation will be documented in a technical report that provides a full artifact catalog, analysis of items collected, results of any special studies conducted, and interpretations of the resource within a regional and local context. All technical documents are to be placed on file at the Northwest Information Center of the California Historical Resources Information System. The results report will also provide recommendations for archaeological and Native American monitoring in Environmentally Sensitive Areas of the proposed Project to the extent deemed appropriate by the qualified archaeologist who carried out the work described here.

**Mitigation Measure CUL-1c: Inadvertent Discovery of Cultural Resources.**

Following implementation of CUL-1b, if prehistoric or historic-period cultural materials that were not identified and studied in the ARDTP are unearthed during ground-disturbing activities, all work will halt within 100 feet of the find until a qualified archaeologist, defined as one meeting the Secretary of the Interior’s Professional Qualification Standards for archaeology, can assess the significance of the find. Prehistoric materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil (“midden”) containing heat-affected rocks and artifacts; stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered-stone tools, such as hammerstones and pitted stones. Historic-period materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. If the find is determined to be potentially significant, the archaeologist, in consultation with the lead agency and appropriate Native American representative, will implement actions outlined in the ARDTP.

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**Impact 3.5-3: Construction of the proposed Project could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature (applies to all pipeline alignments).**

Construction of the proposed Project could result in inadvertent damage to or destruction of fossils that would possibly be unique and/or scientifically important. The potential for disturbance of significant paleontological resources is generally limited to excavation activities within previously undisturbed (i.e., in situ) geologic units. For most of the pipeline alignments, the ground surface is made up of roadway pavement or otherwise previously disturbed ground (i.e., parks, EBMUD utility corridor). However, deep pits would be excavated (e.g., for creek crossings) in areas that may be underlain by previously undisturbed soils. As largely buried resources, the exact location or presence of fossils within undisturbed geologic units cannot be determined. As an initial step, the relative likelihood of encountering fossils was estimated based on the paleontological potential of the rock unit (see Figure 3.5-1 and Table 3.5-3).

As discussed in the Section 3.5.1, Paleontological Setting, certain locations along the pipeline routes are initially screened as sensitive with respect to paleontological resources because they are underlain by geologic units of high paleontological potential. Even shallow excavations in these locations have the potential to yield yet unknown/undiscovered fossils of significance. Other areas of the pipeline underlain by younger alluvium (generally on flat valley floors) are less sensitive to disturbance; however, deeper excavations (generally below 10 feet in depth) in these areas may encounter deeper geologic units that are fossil bearing.

To refine the identification of sensitive areas, a records search was completed. The records search did not identify any existing fossil localities near the pipeline alignments but did identify several fossil localities in the broader region within the same geologic units that could be disturbed by the Project. Because a high percentage of the pipeline alignments is underlain by Pleistocene alluvium, which has high paleontological potential, EBMUD will implement Mitigation Measures CUL-2a and CUL-2b. If resources are discovered, Mitigation Measures CUL-2c and CUL-2d will be implemented. Implementation of Mitigation Measures CUL-1 through CUL-4 would ensure that impacts would be *less than significant*.

**Mitigation Measure CUL-2a: Paleontological Resources Mitigation Program.**

Prior to ground disturbance, the EBMUD will retain a qualified paleontologist or a California Registered Professional Geologist (California RPG) with appropriate paleontological expertise to carry out all mitigation measures related to paleontological resources. The qualified paleontologist or geologist will be available “on-call” to EBMUD throughout the duration of ground-disturbing activities.

**Mitigation Measure CUL-2b: Paleontological resources training.**

All construction forepersons and field supervisors conducting or overseeing subsurface excavations will be trained in the recognition of potential fossil materials prior to ground disturbing activities. A one hour pre-construction training on paleontological resources will also be provided to all other construction workers, but may include videotape of the initial training and/or the use of written materials rather than in person training by the qualified paleontologist. In addition to fossil recognition, the training will convey procedures to follow in the event of a potential fossil discovery.

**Mitigation Measure CUL-2c: Assessment and salvage of potential fossil finds.**

If potential fossils are discovered during construction, all earthwork or other types of ground disturbance in the immediate vicinity of the find will stop until the qualified paleontologist can assess the nature and importance of the find. Based on the scientific value or uniqueness of the find, the paleontologist may record the find and allow work to continue, or recommend salvage and recovery of the fossil. If treatment and salvage is required, recommendations will be consistent with current professional standards. If required, treatment for fossil remains may include preparation and recovery of fossil materials so that they can be housed in an appropriate museum or university collection.

**Mitigation Measure CUL-2d: Monitoring by a qualified Paleontologist during ground disturbing activities.**

If found to be warranted based on experience during construction, a qualified paleontologist, or paleontological monitor working under the supervision of a qualified paleontologist, will monitor ground-disturbing activities. This monitoring would consist of periodically inspecting disturbed, graded, and excavated surfaces, as well as soil stockpiles and disposal sites. The frequency of monitoring would be determined by the qualified paleontologist. If the monitor encounters a paleontological resource, he or she will assess the fossil, and record or salvage it as described in CUL-2c.

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**Impact 3.5-4: Construction of the proposed Project could disturb any human remains, including those interred outside of formal cemeteries (applies to all pipelines).**

While no known human remains have been documented with the project APE, the possibility that human remains are associated with the four known archaeological sites immediately adjacent to the APE cannot be entirely discounted. In the event that human remains are uncovered during project construction, Mitigation Measures CUL-3 will be implemented. Implementation of Mitigation Measure CUL-3 would ensure that impacts would be *less than significant*.

**Mitigation Measure CUL-3: Inadvertent Discovery of Human Remains.**

If potential human remains are encountered, all work will halt within 100 feet of the find and EBMUD will be contacted. EBMUD will contact the county coroner in accordance with PRC Section 5097.98 and Health and Safety Code Section 7050.5. If the coroner determines the remains are Native American, the coroner will contact the NAHC. As provided in PRC Section 5097.98, the NAHC will identify the person or persons believed most likely to be descended from the deceased Native American. The most likely descendent will make recommendations for means of treating, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98.

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# 3.6 Energy Conservation

This section identifies and evaluates issues related to energy conservation in the context of the proposed West of Hills Northern Pipelines Project. This analysis qualitatively assesses the Project's impacts on local and regional energy supplies and consistency with federal, state, and local energy conservation policies.

## 3.6.1 Setting

### Regional and Local Setting

California's energy system includes electricity, natural gas, and crude oil. California produces 69 percent of the electricity used within the state as well as 13 percent of the natural gas[1] and 38 percent of the petroleum. The rest of the state's energy is imported. Electricity imported into California comes from the Pacific Northwest (7 percent) and the Southwestern states (24 percent). Natural gas comes from the Southwest (46 percent), the Rocky Mountain states (22 percent), and Canada (19 percent). Crude oil is imported into the state from foreign sources (48 percent) and Alaska (14 percent) (CEC, 2011a).

#### *Electricity*

The production of electricity requires the consumption or conversion of energy resources, including water, wind, oil, gas, coal, solar, geothermal, and nuclear. Of the electricity generated in-state, 53.4 percent is generated by natural gas-fired power plants, 1.7 percent is generated by coal-fired power plants, 14.6 percent comes from large hydroelectric facilities, and 15.7 percent comes from nuclear power plants. The remaining 14.6 percent of the in-state total electricity production is supplied by renewable sources, including small hydroelectric generation stations (2.2 percent), biomass (2.8 percent), geothermal (6.2 percent), solar (0.4 percent), and wind (3.0 percent) (CEC, 2011b).

Pacific Gas & Electric (PG&E), the local electricity and natural gas supplier in the project area, produces and purchases electricity from both renewable and nonrenewable resources, with power derived from fossil fuels, nuclear sources, and hydroelectric sources. PG&E serves approximately 15 million people in a 70,000-square-mile service area in Northern California, including residential, commercial, and industrial users. Its service infrastructure includes over 150,000 circuit miles of transmission and distribution lines (PG&E, 2012).

Additionally, EBMUD's hydropower, solar, and biogas generation facilities power many of EBMUD's operations and sell excess generation to local utilities, such as PG&E. In an average year, EBMUD produces more renewable energy from hydropower than it consumes, making it a net energy generator. When sufficient water flows are available, EBMUD sells hydropower to electric

1 As the proposed Project does not involve any direct use of natural gas, it will not be discussed further in this section.

power providers. EBMUD's wastewater treatment plant is also a net producer of renewable energy, selling energy back to the electric grid (EBMUD, 2012a).

### *Petroleum*

Approximately 38.1 percent of California's petroleum supply comes from in-state sources while 47.7 percent is imported from foreign sources and 14.2 percent is imported from Alaska (CEC, 2011a). In 2009, California consumed approximately 657.2 million barrels (27.6 billion gallons) of petroleum (U.S. Energy Information Administration [USEIA], 2011a). California's oil fields represent the fourth-largest petroleum producing area in the United States, behind federal off-shore production, Texas, and Alaska. Crude oil is moved within California through a network of pipelines that carry it from both on-shore and off-shore oil wells to the refineries that are located in the San Francisco Bay Area, the Los Angeles area, and the Central Valley (USEIA, 2009).

Most petroleum fuel, or crude oil, produced in California is used in on-road motor vehicles and is refined within California to meet state-specific formulations required by the CARB. The major categories of petroleum fuels are gasoline and diesel for passenger vehicles, transit, rail vehicles, and construction equipment; and fuel oil for industry and electrical power generation. Other liquid petroleum fuels include kerosene, jet fuel, and residual fuel oil for marine vessels.

# 3.6.2 Regulatory Setting

## Federal Regulations

**Energy Policy and Conservation Act.** The Energy Policy Act of 1975 was established in response to the oil crisis of 1973, which increased oil prices due to a shortage of reserves. The Energy Policy Act required that all vehicles sold in the U.S. to meet certain fuel economy goals. The corporate average fuel economy (CAFE) standard for new passenger cars was 27.5 miles per gallon (mpg) from 1990 to 2010, and the CAFE standard for new light trucks (gross vehicle weight of 8,500 pounds or less) grew slowly from 20.0 to 23.5 mpg over the same time period. For model year 2011, these standards were raised to 30.2 and 24.1 mpg, respectively, and recent legislation continues to raise these standards for each future model year. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not subject to CAFE standards. The Energy Policy Act indirectly applies to the proposed Project due to its effects on vehicle fuel efficiencies for the vehicles to be used during construction.

## State Regulations

**State of California Energy Action Plan.** The California Public Utilities Commission (CPUC) and California Energy Commission (CEC) adopted the Energy Action Plan I in 2003 and the Energy Action Plan II in 2005 and published a status update for the 2005 plan in 2008 (CPUC and CEC, 2003, 2005, 2008). The agencies' goals in adopting these plans are to "ensure that adequate, reliable, and reasonably-priced electrical power and natural gas supplies, including prudent reserves, are achieved and provided through policies, strategies, and actions that are cost-effective and environmentally sound for California's consumers and taxpayers." The plans propose to achieve this goal in part by: 1) optimizing energy conservation and resource efficiency, 2) building new generation, 3) upgrading and expanding the electricity transmission and distribution infrastructure and reducing the time to bring facilities on-line, and 4) promoting customer- and utility-owned distributed generation. The plan also establishes a “loading order” prioritizing preferred resources for managing both supply and demand.

The top four major action areas called out in the Energy Action Plan include energy efficiency, demand response, renewable energy sources, and electricity adequacy, reliability, and infrastructure.Other major action areas identified in the 2008 Energy Action Plan Update include electricity market structure; natural gas supply, demand and infrastructure; transportation fuels supply, demand and infrastructure; research, development, and demonstration; and climate change.Energy efficiency includes programs that require buildings and appliances to be constructed in a manner that uses less energy, that provide incentives for purchasing energy efficient equipment, and that provide information and education to encourage people to save energy. Demand response is a rate-based strategy that varies electricity prices throughout the day to encourage lower consumption during peak hours of use, when demand is high and reserves are low. Renewable energy sources include electricity generation using wind, solar, small hydroelectric, geothermal, and biomass technologies. Distributed generation is electricity that is produced by the customer or utility very near the point of use, reducing the demand on the transmission and distribution system. This may include fuel cells, rooftop solar systems, or cogeneration systems that simultaneously produce both electricity and heat or steam for on-site use. However, investments in conventional power plants and transmission and distribution infrastructure will still be needed.

By prioritizing these load management strategies, the Energy Action Plan seeks to implement the lowest-cost and lowest-impact measures first, followed by less cost-effective and less environmentally beneficial or neutral measures, in order to reduce and meet growing energy demand in the state. Of these four action areas all but new renewable energy generation would also reduce the demand for transmission and distribution system capacity.

**State of California Integrated Energy Policy Report.** In 2002, the California State Legislature passed Senate Bill 1389 which requires the CEC biannually to prepare an integrated energy policy report that assesses trends in electricity, natural gas, and transportation fuels and recommends policies “to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the state’s economy; and protect public health and safety” (CEC, 2009). The report calls for the state to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the report identifies several strategies, including assistance to public agencies and fleet operators in implementing incentive programs for Zero Emission Vehicles and their infrastructure needs, and encouragement of urban designs that reduce vehicle miles traveled and accommodate pedestrian and bicycle access.

The 2011 Integrated Energy Policy Report was adopted by the CEC on Feburary 8, 2012. This report focuses on progress toward statewide renewable energy targets; progress by utilities in achieving energy efficiency targets and potential; results of preliminary forecasts of electricity, natural gas, and transportation fuel supply and demand; future energy infrastructure needs; and other energy issues. The CEC is currently preparing the 2012 Integrated Energy Policy Report update, and is due to finish by the end of 2012.

### Local Policies

**EBMUD Sustainability Policy.** In 2008, EBMUD adopted a sustainability policy focusing on using resources (economic, environmental, and human) in a responsible manner that meets current needs without compromising the ability to meet future needs. This approach minimizes waste and conserves energy and natural resources (EBMUD, 2012b).

## 3.6.3 Impacts and Mitigation Measures

### Significance Criteria

Appendix F of the CEQA Guidelines provides guidance for assessing energy impacts of projects. The appendix provides three goals:

- Decreasing overall per capita energy consumption
- Decreasing reliance on natural gas and oil
- Increasing reliance on renewable energy sources

Consistent with Appendix F, environmental impacts evaluated in this analysis include:

a) The project's energy requirements by amount and fuel type for each stage of the project including construction, operation, and maintenance;

b) The effects of the project on local and regional energy supplies and on requirements for additional capacity;

c) The effects of the project on peak and base period demands for electricity and other forms of energy;

d) The degree to which the project complies with existing energy standards;

e) The effects of the project on energy resources; and

f) The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

### Approach to Analysis

The significance analysis was guided by Appendix F of the CEQA Guidelines, which states:

> "…the California Environmental Quality Act requires that EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy."

## Impacts and Mitigation Measures

**Impact 3.6-1: Construction and operation of the proposed Project would result in less-than-significant consumption of energy (applies to all pipelines).**

### *Construction*

Construction of the proposed Project would require the use of fuels (primarily gas, diesel, and motor oil) for a variety of construction activities, including excavation, hauling, paving, and vehicle travel. The construction period for each of the four pipelines is approximately 5 to 12 months, not including mobilization and demobilization. In addition to direct construction-related energy consumption, indirect energy use would be required to make the materials and components used in construction. This includes energy used for extraction of raw materials, manufacturing, and transportation associated with manufacturing.

Fuel use would be consistent with typical construction and manufacturing practices and would not require excessive or wasteful use of energy. Construction activities would not reduce or interrupt existing fuel or electricity delivery systems due to insufficient supply. Additionally, implementation of Mitigation Measure AIR-1a, described and analyzed in Section 3.3, *Air Quality*, would further ensure that fuel energy consumed in the construction phase would not be wasted through unnecessary idling or through the operation of poorly maintained equipment. EBMUD proposes to use excavated material as backfill where feasible, thereby minimizing fuel consumption associated with construction haul trucks and solid waste disposal. Because the construction period for each pipeline would be limited to approximately one year or less, and because construction and manufacturing practices would not require an excessive or wasteful use of energy, energy consumption by construction activities would be *less than significant*.

### *Operation and Maintenance*

The proposed Project would increase water transmission capacity within the West of Hills area; as a result, the primary consideration for energy conservation is the electricity used for pumping water into the various pressure zones serving the West of Hills area. The major pressure zones serving by the Project are the Central Pressure Zone and the Aqueduct Pressure Zone. Both of these pressure zones are gravity fed from the Orinda WTP via the Claremont Tunnel and from the Sobrante WTP via distribution pipelines. The construction of the proposed pipelines would improve the flow of water northward, and because the water flows by gravity, the Project would not require additional pumping or energy use move water to the Central and Aqueduct Pressure Zones. While the main pressure zones are gravity fed, there are numerous pressure zones at higher elevations that are served from these major zones via pumping plants. Water from the lower elevation pressure zones is pumped to reservoirs at higher elevations from which the water is distributed to customers. EBMUD normally operates the pumping plants outside of peak electricity demand periods to avoid paying higher fees for electricity (i.e. pumps are normally off between 11 a.m. and 7 p.m.). However, as described in Chapter 2, under existing conditions, the pumping plants located along the Wildcat Aqueduct, in particular the Crockett Pumping Plant, do not operate efficiently due to limited flows. The Project would improve flow and increase the water pressure at pumping plants thereby improving pumping plant efficiency. The Project would also maximize the useful life of existing EBMUD facilities, resulting in more efficient use of the embodied energy of these facilities and reducing and/or delaying the need for new or expanded facilities, the construction and operation of which would require greater energy resources. Maintenance of the pipelines would require periodic flushing, hydrant testing, anode replacement, leak detection and repair, and maintenance of right-of-ways. These activities would not require a substantial use of energy sources.

Because the proposed Project would improve the efficiency of pumping plants serving the West of Hills area, and extend the useful life of existing EBMUD facilities, the Project is expected to have a *beneficial* impact on energy conservation.

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**Impact 3.6-2: The proposed Project would not result in a significant impact on local and regional energy supplies or on requirements for additional capacity (applies to all pipelines).**

Fuel consumption associated with the use of construction vehicles and equipment would account for the greatest use of energy on-site during construction. However, construction would be temporary (approximately one year or less for each pipeline) and fuel consumption would not represent a substantial depletion of local or regional energy supplies. Therefore, construction would have a *less-than-significant* effect on local and regional energy supplies and/or requirements for additional capacity.

As described under Impact 3.6-1, the proposed Project would improve the efficiency of pumping plants and therefore would not result in an adverse impact on local or regional energy supplies or capacity would result. With the proposed Project, EBMUD would continue to be a net energy generator. No adverse impact on local or regional energy supplies or capacity would result.

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**Impact 3.6-3: The proposed Project would not result in a significant impact on peak and base period demands for electricity and other forms of energy (applies to all pipelines).**

Impacts to electricity demands would occur if significant amounts of electricity were required for construction or operation of the proposed Project such that PG&E would be required to increase their available supply or production capacity. However, as identified under Impact 3.6-1, the proposed Project would improve the efficiency of pumping plants serving the West of Hills area. This will improve EBMUD's ability to pump water during off-peak periods. Consequently, the proposed Project would result in a *less-than-significant* impact related to the demand for electricity or other forms of energy.

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**Impact 3.6-4: Construction and operation of the proposed Project would not conflict with existing energy standards (applies to all pipelines).**

Energy standards such as the Energy Policy Acts of 1975 and 2005, and Title 24 promote strategic planning and building standards that reduce consumption of fossil fuels, increase use of renewable resource, and enhance energy efficiency. In general, these regulations and policies specify strategies to reduce fuel consumption and increase fuel efficiencies and energy conservation. If the proposed Project were to use energy resources in a wasteful manner, it would conflict with state energy standards.

Project construction would be short-term and would not result in the permanent, increased use of non-renewable energy resources. Energy used during construction would be necessary to proposed Project implementation, and with implementation of Mitigation Measure AIR-1a, would not use fuel in a wasteful manner. Therefore, project construction would be consistent with the goals and strategies of state energy standards.

Project operation would use electricity for pumping and would require infrequent trips for routine and emergency maintenance. As identified under Impact 3.6-1, the proposed Project would improve the efficiency of pumping plants serving the West of Hills area. Therefore, neither construction nor operation would conflict with current energy conservation standards, and impacts would be *less than significant*.

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**Impact 3.6-5: The proposed Project would not result in a significant impact related to transportation energy use or use of efficient transportation alternatives (applies to all pipelines).**

As discussed in Impact 3.6-1 above, project construction would consume energy during transportation of labor and materials to and from the project site. Section 2.7 describes the Traffic Control Plan that would be implemented during construction to minimize traffic impacts, and thereby minimize idling and detours that would result in increased energy consumption Additionally, implementation of Mitigation Measure AIR-1a, described and analyzed in Section 3.3, *Air Quality*, would further ensure that fuel energy consumed in the construction phase would not be wasted through unnecessary idling or through the operation of poorly maintained equipment.

The use of transportation alternatives is not relevant to the Project except that construction workers could choose to use alternative transportation to reach the construction site and/or EBMUD truck and equipment storage facility. However, the potential for use of alternative transportation by workers is unknown.

During project operation, transportation-related energy use would be infrequent and minor, consisting of periodic maintenance trips, and these would originate from the local area. For the reasons discussed above, transportation energy use would be *less than significant*.

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# 3.7 Geology and Soils

This section evaluates the potential for the proposed Project to be affected by or to increase risks associated with geologic and seismic hazards. The descriptions of geology, soils, and seismic hazards provided rely on information gathered from the United States Geologic Survey (USGS), the California Geologic Survey (CGS), and a geologic hazard assessment conducted for the proposed Project (EBMUD, 2011). Mitigation measures are identified for impacts that would be significant or potentially significant after evaluating for compliance with existing regulations, accepted engineering standards, and standard EBMUD practices.

## 3.7.1 Setting

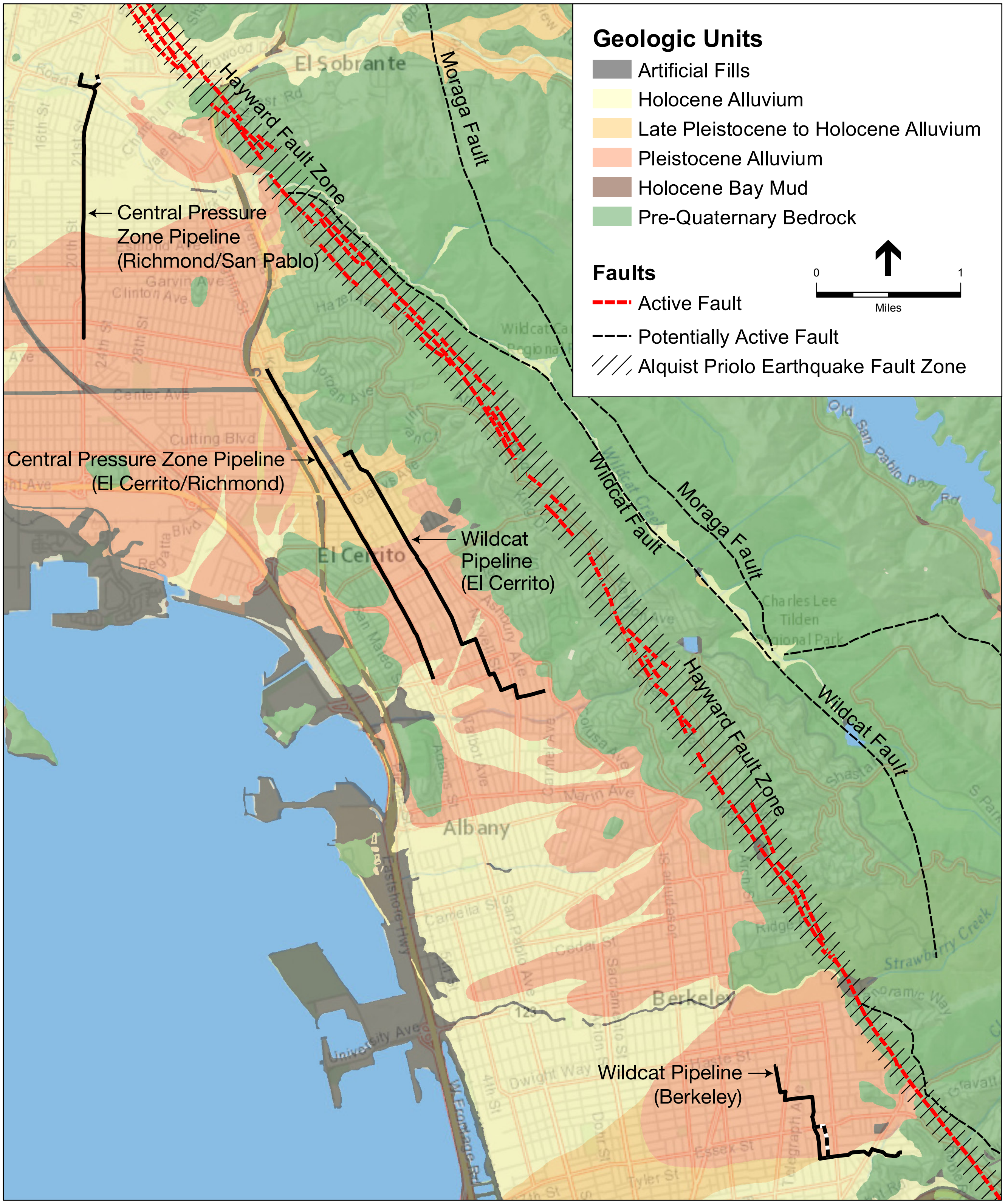
### Regional Physiography

California has been divided into 12 geomorphic provinces that are topographic-geologic groupings of convenience based primarily on landforms and geologic history (Norris and Webb, 1976). The proposed Project is located in the Coast Ranges province, which extends approximately 600 miles, from the Santa Ynez River in Santa Barbara County to the Oregon border in northern Humboldt County. The province consists of northwest-trending mountain ranges, broad basins, and elongated valleys generally parallel to the San Andreas Fault. In the Coast Ranges, older consolidated rocks are characteristically exposed in the mountains but are buried beneath younger, unconsolidated alluvial fan and fluvial sediments in the valleys and lowlands. In the coastal lowlands, these younger sediments commonly interfinger with marine deposits.

The Coast Ranges are generally divided in two sub-provinces, north and south of San Francisco Bay. The proposed Project is located in the southern Coast Ranges sub-province. The major geographic features in this sub-province include: the Diablo Range, Santa Cruz Mountains, San Francisco Peninsula, and San Francisco Bay. Significant physiographic features include San Francisco Bay and the broad alluvial fans (or flatlands) that were formed between the mountain ranges and the bay.

### Project Area Geology

The geological setting of the project area is based on published mapping by the USGS. All four Project pipeline alignments are located to the west of the Hayward Fault zone, on an alluvial plane adjacent to San Francisco Bay. **Figure 3.7-1** shows the project area geology and **Table 3.7-1** lists the geologic units identified along each alignment, as well as the landslide area type and liquefaction susceptibility. The alluvial plain includes sediments eroded from the Berkeley Hills over the last 2 million years and generally consists of unconsolidated mixtures of gravel, sand, clay, and silt typically deposited by streams. The specific units present include Holocene, Holocene to Latest Pleistocene, and Latest Pleistocene-age alluvial deposits (USGS, 2006). Alluvial deposits in the vicinity of Wildcat and San Pablo Creeks include Latest Holocene-age alluvial fan levee, modern stream channel deposits, and stream terrace deposits.




SOURCE: USGS, 2006; CDMG, 2001

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**Figure 3.7-1**
Geologic Units and Faults

**TABLE 3.7-1**
**GEOLOGIC UNITS, LANDSLIDE SUSCEPTIBILITY, AND LIQUEFACTION SUSCEPTIBILITY**

| Pipeline Segment | Geologic Unit[a] | Landslide Area Type[b] | Liquefaction Susceptibility[c] |
|---|---|---|---|
| Wildcat Pipeline (Berkeley) | Late Pleistocene to Holocene Alluvium, Pleistocene Alluvium | Few Landslides | Low, Medium |
| Wildcat Pipeline (El Cerrito) | Holocene Alluvium, Late Pleistocene to Holocene Alluvium, Pleistocene Alluvium | Few Landslides | Very Low, Low, Medium |
| Central Pressure Zone Pipeline (El Cerrito/Richmond) | Holocene Alluvium, Late Pleistocene to Holocene Alluvium, Pleistocene Alluvium | Few Landslides | Very Low, Low, Medium |
| Central Pressure Zone Pipeline (Richmond/ San Pablo) | Holocene Alluvium, Late Pleistocene to Holocene Alluvium | Flatland | Low, Medium, High, Very High |

NOTES:
[a] See Figure 3.7-1 for the distribution of geologic units listed.
[b] See Figure 3.7-2 for the distribution of landslide area type
[c] See Figure 3.7-4 for the distribution of liquefaction susceptibility

SOURCES: USGS, 1997; USGS, 2006; Orion Environmental Associates.

The alluvial plain is generally underlain by bedrock of the Franciscan Complex, but the hills to the east of the pipeline alignments are composed of a variety of bedrock types. In the vicinity of the Wildcat Pipeline (Berkeley) alignment, the Berkeley Hills to the east are primarily composed of four bedrock units (USGS, 1996). Three of these units are Late Cretaceous-age unnamed sedimentary rocks of the Great Valley sequence such as greywacke, siltstone, and mudstone; volcanic rocks of Late Jurassic age; and shale of the Late Jurassic and Early Cretaceous Knoxville formation. The southern tip of the Wildcat Pipeline (Berkeley) is bordered by mélange of the Late Jurassic and/or Early Cretaceous Franciscan Complex. Mélange is a mixture of rock materials of differing sizes and types generally contained within a sheared matrix, and can contain naturally occurring asbestos.

In the vicinity of the proposed Wildcat Pipeline (El Cerrito), Central Pressure Zone Pipeline (El Cerrito/Richmond), and Central Pressure Zone Pipeline (Richmond/San Pablo) alignments, the hills to the east are primarily composed of Cenozoic-age sedimentary rocks of various formations (USGS, 1994). Serpentenite of the Franciscan Complex outcrops near the Hayward Fault Zone, more than 0.5 miles northeast of the northern terminus of the Wildcat Pipeline (El Cerrito) alignment and east of the northern terminus of the Central Pressure Zone Pipeline (El Cerrito/Richmond) alignment. Greenstone of the Francisco Complex is mapped adjacent to the Central Pressure Zone Pipeline (El Cerrito/Richmond) alignment near the intersection of San Pablo Avenue and Moeser Lane in El Cerrito. Both the greenstone and serpentinite are regionally known to contain naturally occurring asbestos.

## Geologic Hazards

### *Slope Failure*

Slope failures, commonly referred to as landslides, include many phenomena that involve the downslope displacement and movement of material, triggered either by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Exposed rock slopes undergo rockfalls, rockslides, or rock avalanches, while soil slopes experience soil slumps, rapid debris flows, and deep-seated rotational slides. Slope stability can depend on several complex variables, including the geology, structure, topography, slope geometry, and amount of groundwater present, as well as external processes such as climate and human activity. The factors that contribute to slope movements include those that decrease the resistance in the slope materials and those that increase the stresses on the slope.

Landslides can occur on slopes of 15 percent or less, but the probability is greater on steeper slopes that exhibit old landslide features such as scarps, slanted vegetation, and transverse ridges. Landslides typically occur within slide-prone geologic units that contain excessive amounts of water or are located on steep slopes, or where planes of weakness are parallel to the slope angle.

The best available predictor of where slides and earth flows might occur is the distribution of past movements (Nilsen and Turner, 1975). In 1997, the USGS released a preliminary map and geographic information system (GIS) database that provides a summary of the distribution of landslides evident in the landscape of the San Francisco Bay region (USGS, 1997). The map is a digitized nine-county compilation of existing landslides that has been used to divide the area into four landslide prevalence zones. As shown on **Figure 3.7-2** and summarized in Table 3.7-1, the proposed Wildcat Pipeline (Berkeley), Wildcat Pipeline (El Cerrito), and Central Pressure Zone Pipeline (El Cerrito/Richmond) alignments are located in areas mapped as “Few Landslides.” These areas are defined as containing few, if any, large mapped landslides but locally containing scattered small landslides and questionably identified larger landslides. The Central Pressure Zone Pipeline (Richmond/San Pablo) alignment is in an area mapped as “flatland.” This includes low-elevation areas of gentle slope that have little or no potential for the formation of slumps, landslides, or earth flows, except along stream banks and terrace margins.

### *Soils*

Problematic soils, such as those that are expansive and corrosive, can damage buried utilities and increase maintenance requirements. Expansive soils are characterized by their ability to undergo significant volume change (i.e., to shrink and swell) as a result of variations in moisture content. Changes in soil moisture can result from rainfall, landscape irrigation, utility leakage, roof drainage, and/or perched groundwater.[1] Expansive soils are typically very fine-grained and have a high to very high percentage of clay. Expansion and contraction of expansive soils in response to changes in moisture content can lead to differential and cyclical movements that can cause damage and/or distress to structures and equipment.

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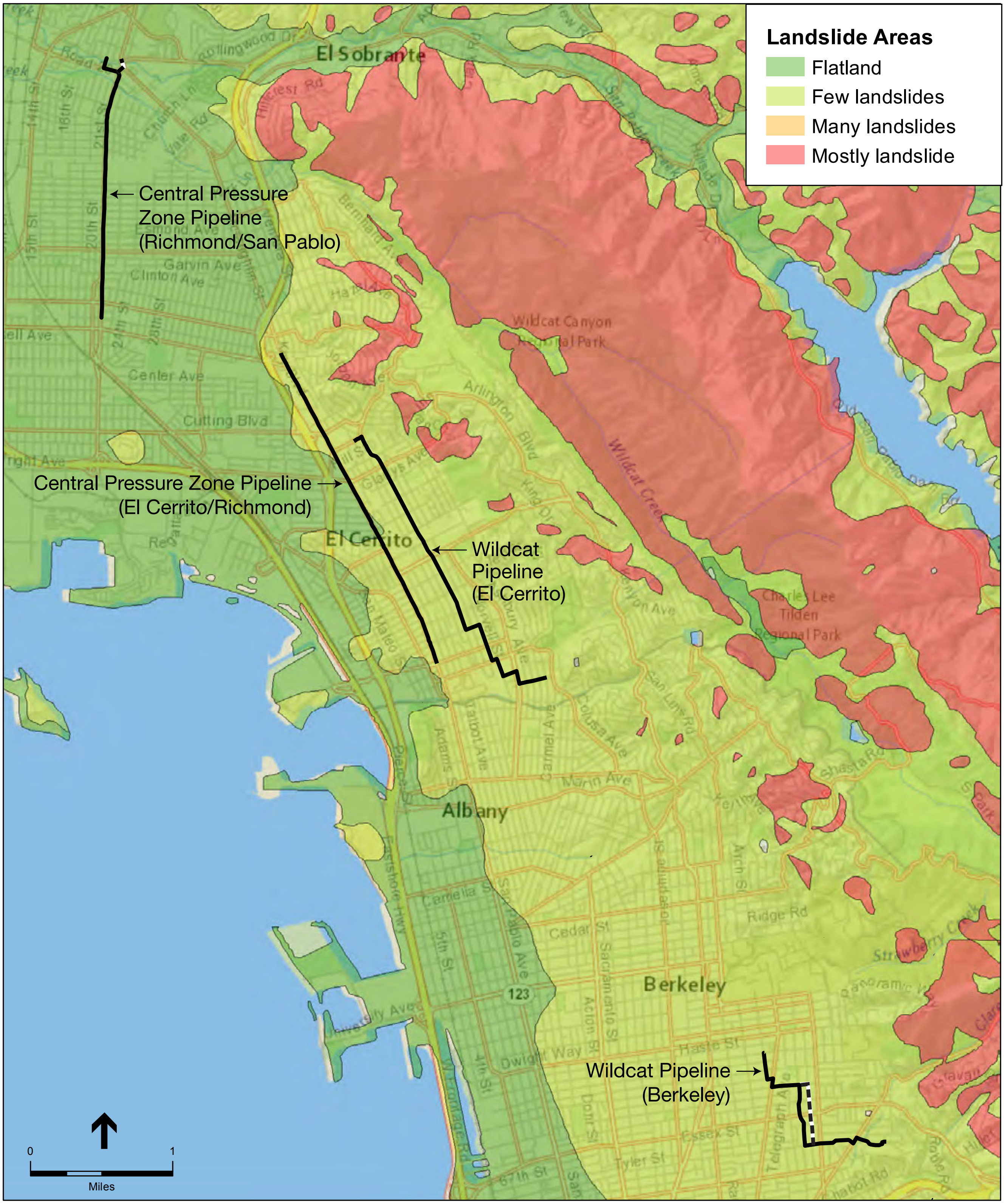
[1] Perched groundwater is a local saturated zone above the water table that typically exists above an impervious layer (such as clay) of limited extent.




SOURCE: USGS, 1997; CGS, 2003

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**Figure 3.7-2**
Landslide Hazard Map

The corrosivity of soils is commonly related to several key parameters, including soil resistivity (the ability to conduct electricity), the presence of chlorides and sulfates, oxygen content, and pH. Typically, the most corrosive soils are those with the lowest pH (acidic) and highest concentration of chlorides and sulfates. Changes in soil moisture can result in a concentration of chlorides and sulfates as well as movement in the soil, both of which tend to break down the protective corrosion films and coatings on the surfaces of building materials. High-sulfate soils are also corrosive to concrete and may prevent complete curing, reducing its strength considerably. Low pH and/or low-resistivity soils can corrode buried or partially buried metal structures. Depending on the degree of corrosivity of subsurface soils, building materials such as concrete, reinforcing steel in concrete structures, and bare-metal structures exposed to these soils can deteriorate, eventually leading to structural failures.

Where the proposed pipelines would be constructed within open trenches, the trenches would be backfilled with engineered backfill and pipe bedding material to ensure that the pipeline is surrounded by structurally suitable material that is not expansive. Similarly, where the Central Pressure Zone Pipeline (Richmond/San Pablo) would be installed with jack and bore under Wildcat Creek, the pipeline would be constructed within a casing pipe and backfilled with cement grout or other engineered fill. However, specific soil conditions may affect pipeline construction where the Central Pressure Zone Pipeline (Richmond/San Pablo) would cross San Pablo Creek via a pipe bridge. Soils within this area are mapped as Conejo Clay Loam, 0 to 2 Percent Slopes. This soil unit forms on slopes of 0 to 2 percent and exhibits a moderate shrink-swell potential, high risk of corrosion to uncoated steel, and moderate risk of corrosion to concrete (Natural Resources Conservation Service [NRCS], 2012).

## Regional Faulting and Seismic Hazards

### *Seismicity*

The San Francisco Bay Area is situated near the boundary between two major tectonic plates, the Pacific Plate to the southwest and the North American Plate to the northeast. Since the Miocene epoch (approximately 23 million years ago), about 200 miles of right-lateral movement[2] has occurred along the San Andreas Fault Zone to accommodate the relative movement between these two plates. The movement between the Pacific Plate and the North American Plate generally occurs across a 50-mile zone extending from the San Gregorio fault in the southwest to the Great Valley Thrust Belt to the northeast. In addition to the right-lateral slip movement between the two tectonic plates, portions of the North American Plate have moved toward each other during the last 3.5 million years, resulting in compressional forces at the latitude of San Francisco Bay (Fenton and Hitchcock, 2001).

[2] The Pacific Plate and the North American Plate are moving past each other along the San Andreas Fault Zone; "right-lateral movement" means that they are moving to the right relative to each other.

**Figure 3.7-3** shows the locations of active[3] and potentially active[4] faults in the San Francisco Bay region. The San Andreas, San Gregorio, Hayward, Rodgers Creek, Calaveras, and Greenville strike-slip faults[5] are active faults of the San Andreas system that predominantly accommodate lateral movement between the North American and Pacific tectonic plates. Active blind- and reverse-thrust faults[6] in the San Francisco Bay region that accommodate compressional movement include the Monte Vista–Shannon and Mount Diablo faults.

The USGS estimates that there is a 63 percent probability of a strong earthquake (magnitude [Mw][7] 6.7 or higher) occurring on one of the regional faults in the 30-year period between 2003 and 2032, with a 31 percent chance of such an earthquake within the Rodgers Creek–Hayward fault system, located as close as 0.4 mile to the southern end of the Wildcat (Berkeley) alignment and 0.5 mile to the northern end of the Central Pressure Zone Pipeline (Richmond/San Pablo) alignment (USGS, 2008). The other faults with the greatest potential to affect the proposed Project are the San Andreas and Calaveras faults. The San Andreas fault is approximately 16 miles to the west of the project area and the Calaveras fault parallels the Hayward fault, approximately 16 miles to the southeast of the project area. Each of these faults is capable of generating large (greater than Mw 7) earthquakes.[7]

### *Fault Rupture*

Surface rupture occurs when movement on a fault deep within the earth breaks through to the surface. Surface ruptures associated with the 1906 San Francisco earthquake extended for more than 260 miles, with displacements of up to 21 feet. However, not all earthquakes result in surface rupture. The Loma Prieta earthquake of 1989 caused major damage in the San Francisco Bay Area, but the fault movement did not break through to the ground surface.

Fault rupture almost always follows preexisting faults, which are zones of relative weakness in the earth's crust. Rupture may occur suddenly during an earthquake or slowly in the form of fault creep. Sudden displacements are more damaging to structures because they can displace structures and are accompanied by shaking. Fault creep is the slow rupture of the earth's crust. In highly developed areas of Contra Costa and Alameda Counties, the Hayward Fault exhibits fault creep, which offsets and deforms curbs, streets, buildings, and other structures that lie on the fault trace. None of the proposed pipeline alignments cross a known active or potentially active fault trace.

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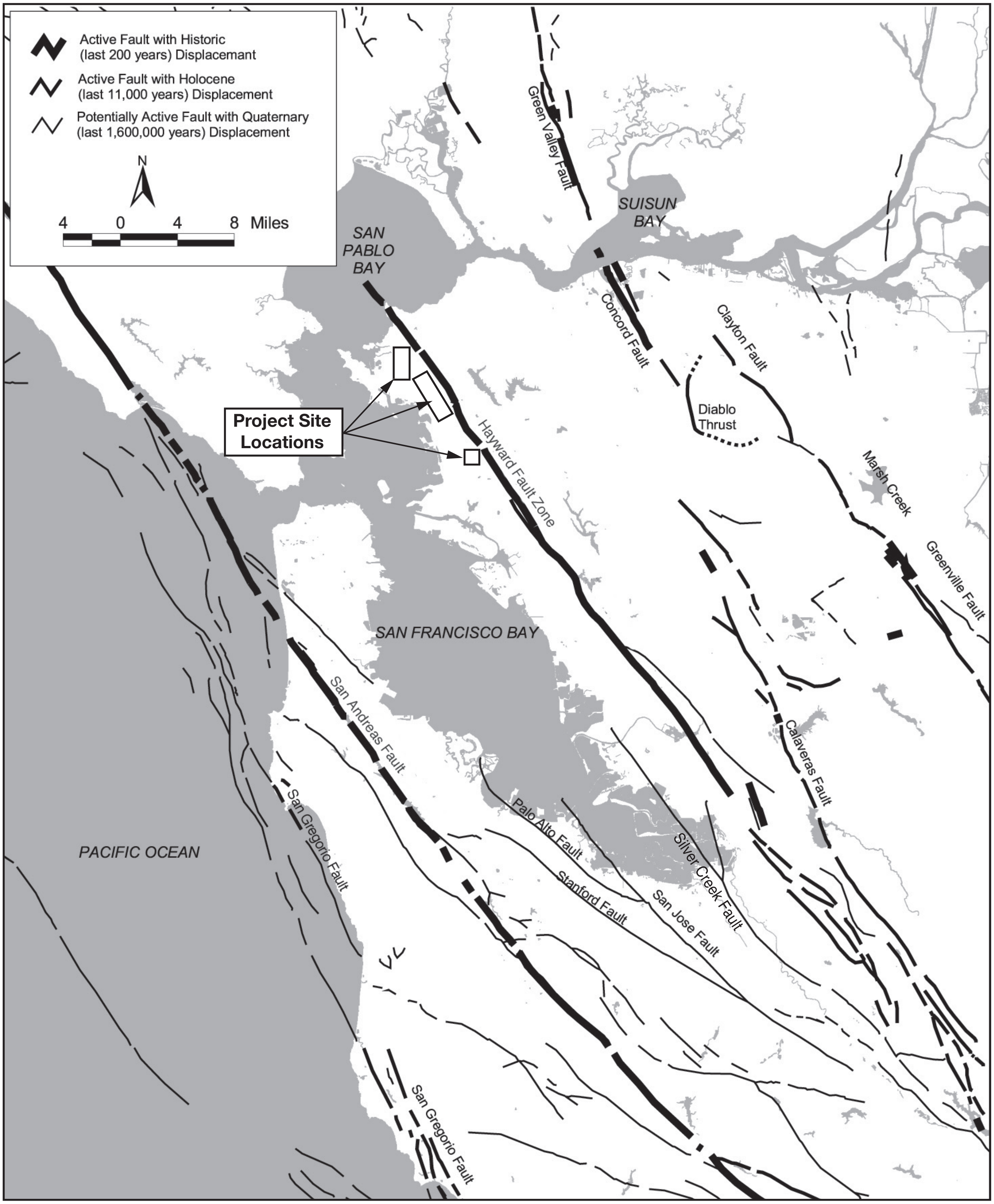
3 An active fault is one that shows geologic evidence of movement within Holocene time (approximately the last 11,000 years).

4 A potentially active fault is one that shows geologic evidence of movement during the Quaternary (approximately the last 1.6 million years).

5 Strike-slip faults involve the two blocks moving parallel to each other without a vertical component of movement.

6 A reverse fault is one with predominantly vertical movement in which the upper block moves upward in relation to the lower block; a thrust fault is a low-angle reverse fault. Blind-thrust faults are low-angled subterranean faults that have no surface expression.

7 Earthquake magnitude is a logarithmic measure of earthquake size. In simple terms, this means that at the same distance from the earthquake, the shaking will be 10 times as large during a Mw 5 earthquake as during a Mw 4 earthquake. The total amount of energy released by the earthquake, however, goes up by a factor of 32. Depending on their location, earthquakes with a magnitude of 7 and greater are capable of causing large amounts of damage.




SOURCE: California Department of Conservation, Geological Survey (After Jennings, 1994)

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**Figure 3.7-3**
Principal Active Faults in the Project Vicinity

### *Ground shaking*

The intensity of the seismic shaking, or strong ground motion, during an earthquake affecting the project area would depend on the distance to the epicenter of the earthquake, the magnitude of the earthquake, and the geologic conditions underlying and surrounding the area. Earthquakes occurring on faults closest to the project area would have the potential to generate the largest ground motions.

The intensity of earthquake-induced ground motions and the potential forces that could affect structures within the project area can be described in terms of "peak ground acceleration," which is represented as a fraction of the acceleration of gravity (g).[8] The CGS estimates the peak ground accelerations for the 10 percent probability of exceedance in 50 years to be 0.68 to 0.78g along the pipeline segment alignments, with the highest values in the area where the Wildcat Pipeline (Berkeley) is proposed (CGS, 2003). **Table 3.7-2** shows the relation of average peak ground accelerations to shaking intensities based on the modified Mercalli intensity scale. As shown, these ground accelerations correlate to a shaking intensity value of IX (violent). At this intensity, damage could be considerable in specially designed structures, ground failures could occur, and underground pipes could be broken.

However, these estimates of peak ground accelerations are used primarily for formulating building codes and for designing structures, and are not intended for site-specific hazard analysis. Therefore, it would be necessary to conduct an evaluation to estimate earthquake parameters along each pipeline segment alignment at a level suitable for project design.

### *Liquefaction*

Liquefaction is a phenomenon in which saturated granular sediments temporarily lose their shear strength during periods of strong ground shaking such as during an earthquake. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments and the magnitude of earthquakes likely to affect the site. Saturated, unconsolidated silts, sands, silty sands, and gravels within 50 feet of the ground surface are most susceptible to liquefaction. Liquefaction-related phenomena include vertical settlement from densification, lateral spreading, ground oscillation, flow failures, loss of bearing strength, subsidence, and buoyancy effects.

The USGS classifies liquefaction susceptibility according to five categories that describe the likely proportion of all liquefaction occurrences that could take place in each category, the abundance or frequency of liquefaction occurrence within the category, the strength of shaking required to produce liquefaction, and the geologic units included (USGS, 2006).

- ***Very High.*** The USGS estimates that about 40 to 50 percent of future liquefaction effects would occur within geologic units assigned this category. Only modest ground shaking (peak ground acceleration of about 0.1 g) would be required to cause liquefaction. Geologic map units that fall within this category include the latest Holocene and historical stream channel deposits, as well as artificial fills over bay and other estuarine mud.

[8] The acceleration of gravity (g) = 980 centimeters per second squared. 1.0 g of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

**TABLE 3.7-2
MODIFIED MERCALLI INTENSITY SCALE**

| Intensity Value | Intensity Description | Average Peak Ground Acceleration[a] |
|---|---|---|
| I | Not felt except by a very few persons under especially favorable circumstances. | < 0.0017 g |
| II | Felt only by a few persons at rest, especially on upper floors on buildings. Delicately suspended objects may swing. | 0.0017-0.014 g |
| III | Felt noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly, vibration similar to a passing truck. Duration estimated. | 0.0017-0.014 g |
| IV | During the day felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably. | 0.014–0.039g |
| V (Light) | Felt by nearly everyone, many awakened. Some dishes and windows broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles may be noticed. Pendulum clocks may stop. | 0.035 – 0.092 g |
| VI (Moderate) | Felt by all, many frightened and run outdoors. Some heavy furniture moved; fallen plaster or damaged chimneys. Damage slight. | 0.092 – 0.18 g |
| VII (Strong) | Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars. | 0.18 – 0.34 g |
| VIII (Very Strong) | Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed. | 0.34 – 0.65 g |
| IX (Violent) | Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken. | 0.65 – 1.24 g |
| X (Very Violent) | Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks. | > 1.24 g |
| XI (Very Violent) | Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly. | > 1.24 g |
| XII (Very Violent) | Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air. | > 1.24 g |

NOTE:
[a] Value is expressed as a fraction of the acceleration of gravity.

SOURCE: ABAG, 2003

- ***High.*** The USGS estimates that about 20 to 30 percent of future liquefaction effects would occur within geologic units assigned this category. Relatively modest ground shaking (peak ground acceleration of about 0.1 to 0.2 g) would be required to cause liquefaction. Geologic map units within this category include the latest Holocene and historical alluvium, natural levees, and stream terraces.

- ***Moderate.*** The USGS estimates that about 20 to 30 percent of future liquefaction effects would occur within geologic units assigned this category. Somewhat stronger ground shaking (peak ground acceleration greater than about 0.1 to 0.2 g) would be required to cause liquefaction. Geologic map units within in this category include the latest Pleistocene and Holocene bay and other estuarine mud, alluvial fan and levee deposits, and stream terrace deposits.

- ***Low.*** The USGS estimates that about 2 percent of future liquefaction effects would occur within geologic units assigned this category. Stronger ground shaking (peak ground acceleration of about 0.5 g) would be required to cause liquefaction. Geologic map units within in this category include basin deposits, various late Pleistocene deposits, and Pleistocene marine terrace deposits.

- ***Very Low.*** The USGS estimates that about 2 percent of future liquefaction effects would occur within geologic units assigned this category. Stronger ground shaking (peak ground acceleration greater than about 0.6 g) would be required to cause liquefaction. Geologic map units within in this category include Pleistocene deposits, pre-Quaternary deposits, and bedrock.

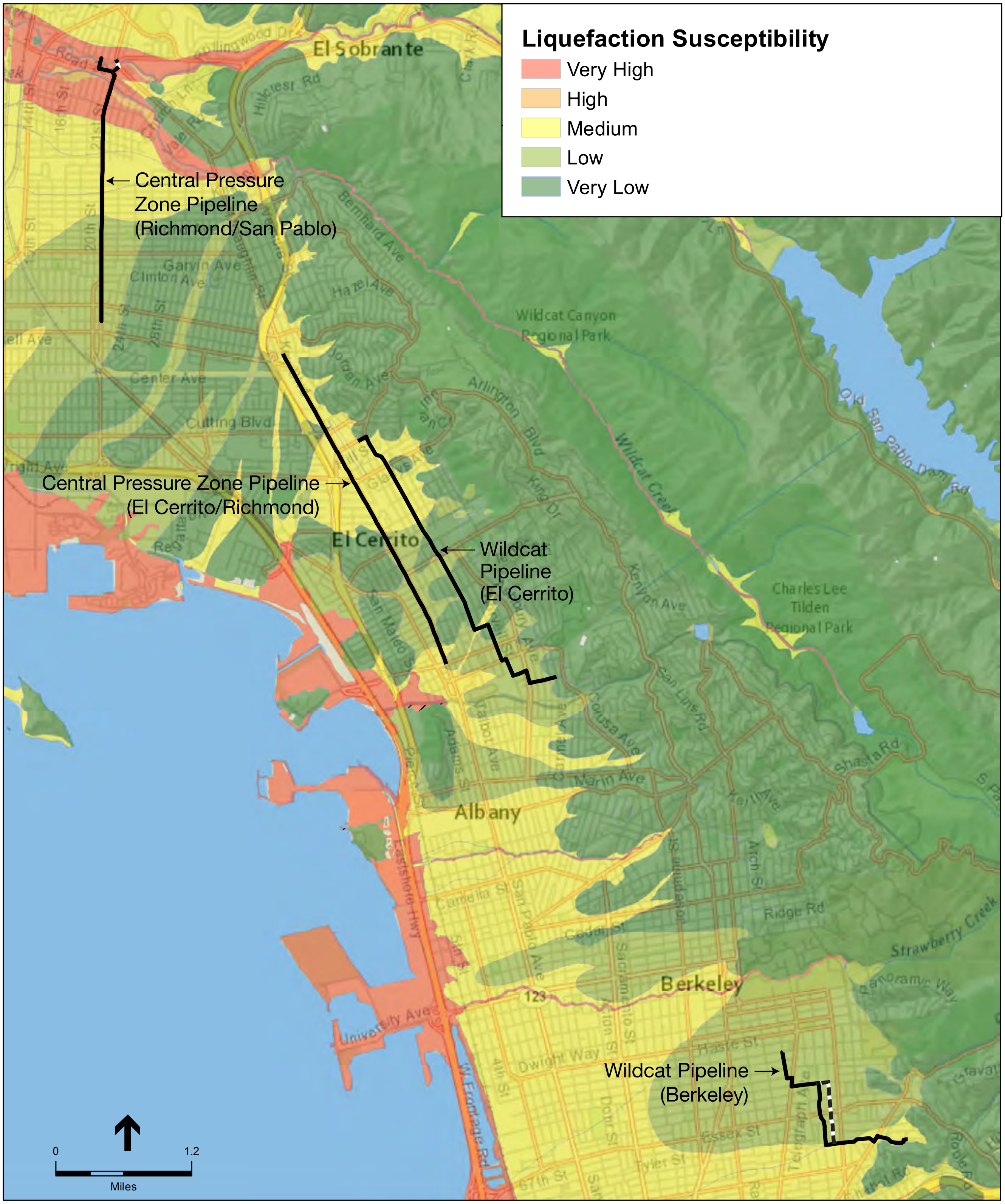
As shown on **Figure 3.7-4**, the proposed pipeline alignments cross areas of very low to medium liquefaction susceptibility. However, the Central Pressure Zone (Richmond/San Pablo) alignment also crosses an area of high to very high liquefaction susceptibility associated with the modern stream channel deposits and Latest Holocene-age alluvial fan levee and stream terrace deposits at Wildcat and San Pablo Creeks.

### *Lateral Spreading*

Of the liquefaction hazards, lateral spreading generally causes the most damage. Lateral spreading involves large blocks of intact, non-liquefied soil moving downslope on a liquefied substrate of large aerial extent (Youd and Perkins, 1978). The mass moves toward an unconfined area, such as a descending slope or stream-cut bluff, and can occur on slope gradients as gentle as 1 degree.

### *Earthquake-Induced Settlement*

Settlement of the ground surface can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid rearrangement, compaction, and settling of subsurface materials (particularly loose, non-compacted, and variable sandy sediments). Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). Areas are susceptible to differential settlement if underlain by compressible sediments, such as poorly engineered artificial fill or bay mud.




SOURCE: USGS, 2006; CGS, 2003

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**Figure 3.7-4**
Liquefaction Hazard Map

### Seismic Slope Instability

Earthquake motions can also induce substantial stresses in slopes, causing earthquake-induced landslides or ground cracking when the slope fails. Earthquake-induced landslides can occur in areas with steep slopes that are susceptible to strong ground motion during an earthquake. The 1989 Loma Prieta earthquake triggered thousands of landslides over an area of 770 square miles. The CGS has not mapped potential seismic hazard zones in most of the project area. However, it is likely that earthquake-induced landsliding could occur in areas identified by the USGS as prone to landslides. These zones are discussed in the Slope Failure section, above. As discussed in that section and shown on Figure 3.7-2, all of the proposed pipeline alignments cross areas designated by the USGS as “few landslides” or “flatland”.

## 3.7.2 Regulatory Setting

### Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. In accordance with this act, the state geologist established regulatory zones, called “earthquake fault zones,” around the surface traces of active faults and has published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. Each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace because many active faults are complex and consist of more than one branch that may experience ground surface rupture.

Title 14 of the California Code of Regulations (CCR), Section 3601(e), defines buildings intended for human occupancy as those that would be inhabited for more than 2,000 hours per year. The proposed Project does not cross the Alquist-Priolo Earthquake Fault Zone for the Hayward fault (Figure 3.7-1) and does not include any buildings that meet this criterion for human occupancy. Therefore, this act does not apply to the proposed Project.

### Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was passed in 1990 following the Loma Prieta earthquake to reduce threats to public health and safety and to minimize property damage caused by earthquakes. The Act directs the California Department of Conservation to identify and map areas prone to the earthquake hazards of liquefaction, earthquake-induced landslides, and amplified ground shaking. For structures intended for human occupancy, the act requires site-specific geotechnical investigations to identify potential seismic hazards and formulate mitigation measures before permitting most developments designed for human occupancy within the Zones of Required Investigation. The CGS has mapped seismic hazards in Alameda County but not Contra Costa County. However, the proposed Project would not involve the construction of any structures for human occupancy. Therefore, this act does not apply to the proposed Project.

## EBMUD Engineering Standard Practices

EBMUD uses two primary Engineering Standard Practices for the design of water pipelines in its distribution system to address geologic hazards. Engineering Standard Practice 512.1, Water Main and Services Design Criteria, establishes basic criteria for the design of water pipelines. This practice establishes minimum requirements for pipeline construction materials. Engineering Standard Practice 550.1 addresses seismic design of the pipelines to withstand seismic hazards including fault rupture, ground shaking, liquefaction-related phenomena, landsliding, and seiches and tsunamis. This standard requires that EBMUD establish project-specific seismic design criteria for pipelines with a diameter of greater than 12-inches, such as the water mains that would be installed under the proposed Project. Procedures to avoid seismic hazards include selecting appropriate routing to avoid seismic hazards, use of appropriate materials to withstand seismic hazards, and providing flexibility at locations where the pipeline crosses from one soil condition to another. The standard also requires use of steel pipe with restrained joints or the equivalent to address fault rupture, liquefaction, and landslide hazards. Isolation valves may also be required on either side of the seismic hazard zone. For landslide areas, the pipeline may be set back far enough from the toe or top of the slope to avoid being located in a zone of slippage or a buttress or retaining structure may be used to stabilize the slope. Engineering Standard Practice 550.1 is based on *Guidelines for the Seismic Design of Oil and Gas Pipeline Systems* prepared by the American Society of Civil Engineers (ASCE) Committee on Gas and Liquid Fuel Lifelines (1984). In addition to these internal standards, EBMUD follows the recommendations of the American Water Works Association (AWWA) for the design and installation of steel pipe, including design for the appropriate wall thickness, external loadings, pipeline supports, pipe joints, fittings and appurtenances, corrosion control, and protective coatings and linings (AWWA, 2004).

## EBMUD Standard Construction Specifications

Section 01 35 44 of EBMUD's Master Specifications, Environmental Requirements, includes provisions for the protection of water quality. Regarding site activities, the specifications require the construction contractor to:

- Prevent the discharge of debris, soil, silt, sand, and any other organic or earthen materials to a surface water or storm drain system. Discharges of asphalt, rubbish, paint, oil or petroleum products, cement and concrete or washings thereof are also prohibited. These materials may also not be stored where they can be washed outside of the construction limits by rainfall or runoff. When construction is completed, these materials must be disposed of in accordance with the Construction and Demolition Waste Disposal Plan.
- Prevent creation of a nuisance pollution as defined in the California Water Code, and may not cause a violation of water quality standards for receiving waters adopted by the RWQCB or SWRCB.
- Clean up spills immediately, and notify EBMUD in the event of a spill.
- Equip stationary equipment such as motors, pumps, and generators with drip pans.
- Divert or otherwise control surface water and other waters flowing onto the work areas. The methods of diversions or control must be adequate to ensure the safety of stored

materials and personnel in the work area. At the completion of work, ditches, dikes, and other ground alterations made by the contractor must be removed and ground conditions must be returned to their former condition.

- Maintain construction sites to ensure that drainage from the site will minimize erosion of stockpiled or stored materials and the adjacent native soil material.
- Conduct dust control measures in a manner to prevent runoff from the site.
- Handle, store, apply, and dispose of any chemical or hazardous material in accordance with federal, state, and local laws and regulations.

Regarding compliance with the Stormwater General Construction Permit, the contractor must prepare the permit registration documents, including the SWPPP, subject to review and approval by EBMUD. The contractor must also comply with all permit requirements, including implementation of effective stormwater/non-stormwater management, conducting inspections and monitoring requirements of the permit, and ensuring permit coverage termination at the completion of construction by preparing a Notice of Termination.

## 3.7.3 Impacts and Mitigation Measures

### Significance Criteria

For the purposes of this EIR and consistent with Appendix G of the CEQA Guidelines, the proposed Project is considered to have a significant impact if it would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death.
- Result in substantial soil erosion or the loss of topsoil.
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.
- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

### Approach to Analysis

#### *Methodology*

The potential for impacts related to geology, soils, and seismicity are evaluated according to the significance criteria listed above based on published geologic and seismic information related to the geology and seismicity of the project area. Mitigation measures are identified for impacts that would be significant or potentially significant after evaluating for compliance with EBMUD's standard construction specifications.

Based on project characteristics and the geologic resources in the area, no impacts are anticipated with respect to the following topics:

- ***Soils incapable of supporting septic tanks or alternative wastewater disposal systems.*** The proposed Project would not result in the production or disposal of wastewater. Therefore, impacts related to the capacity of soils in the project area to support septic tanks or alternative wastewater disposal systems are not applicable.

## Impacts and Mitigation Measures

**Impact 3.7-1: Surface Fault Rupture (applies to all pipelines).**

As discussed in the Setting section, the Rodgers Creek–Hayward fault system is located as close as 0.4 mile to the southern end of the Wildcat Pipeline (Berkeley) alignment and 0.5 mile to the northern end of the Central Pressure Zone Pipeline (Richmond/San Pablo) alignment. However, none of proposed pipeline alignments are crossed by an active fault trace. Therefore, impacts related to surface fault rupture would be *less than significant*.

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**Impact 3.7-2: Seismic-related ground failure including liquefaction (applies to all pipelines).**

Liquefaction-related phenomena can include lateral spreading, ground oscillation, loss of bearing strength, subsidence, and buoyancy effects, all of which can damage pipelines. During the loss of bearing capacity, large deformations can occur within the soil mass. Damage from liquefaction and lateral spreading is generally most severe when liquefaction occurs within 15 to 20 feet of the ground surface.

Seismically induced settlement can also occur in areas underlain by compressible sediments. Stream channel deposits, such as those at the Wildcat Creek and San Pablo Creek crossings, are generally the most susceptible to earthquake-induced settlement. In addition, lateral spreading can occur in liquefiable soils near open slopes, such as the banks of San Pablo Creek where the pipe bridge would be constructed. Lateral spreading can extend several hundred feet from a slope, and displacements in the range of tens of feet can occur if soil conditions are especially favorable for liquefaction and earthquake shaking is of sufficient duration. Lateral spreading was responsible for most of the pipeline failures in San Francisco during the 1989 Loma Prieta earthquake.

During an earthquake, underground utilities tend to fail at the interface between a softer unit and a stiffer unit owing to the settlement that occurs within the softer unit, a phenomenon known as “differential settlement.” Differential settlement is of concern, as it can cause the uneven movement of pipelines, resulting in substantial damage to pipelines, including cracks and breakage.

As discussed in the Setting section, the proposed pipeline alignments cross areas of very low to medium liquefaction susceptibility, except where the proposed Central Pressure Zone Pipeline (Richmond/San Pablo) crosses Wildcat and San Pablo Creeks. Where the liquefaction susceptibility is low to medium, impacts related to liquefaction and other seismically-induced ground failures would be *less than significant* because the underground pipelines would be imbedded in structural fill and would be constructed in accordance with seismic design standards such as the AWWA's standards for design and installation of steel pipe, standards of the American Society of Mechanical Engineers, standards of the American Welding Society for structural welding and EBMUD Engineering Standard Practice 550.1 (described in the Regulatory Setting section ), which would reduce the potential for damage due to liquefaction.

The Central Pressure Zone (Richmond/San Pablo) alignment crosses an area of high to very high liquefaction susceptibility associated with the modern stream channel deposits and Latest Holocene-age alluvial fan levee and stream terrace deposits at Wildcat and San Pablo Creeks, and this area could be subject to seismically induced settlement and lateral spreading. Further, at the San Pablo Creek crossing, the pipeline would be more susceptible to damage from liquefaction, seismically-induced settlement, and lateral spreading because the pipe bridge footings would be constructed in the banks of San Pablo Creek where lateral spreading could occur. Therefore, impacts related to liquefaction and associated phenomena are potentially significant at the Wildcat and San Pablo Creek crossings. Implementation of Mitigation Measure GEO-1, Site-Specific Geotechnical Investigation, would reduce this impact to a *less-than-significant* level by requiring a geotechnical investigation to evaluate site-specific hazards of liquefaction and related hazards at the creek crossings and to incorporate the recommendations of the geotechnical report into the final design for the pipeline and the pipe bridge at the creek crossings.

**Mitigation Measure GEO-1: Site-Specific Geotechnical Investigation.**

For the Central Pressure Zone Pipeline (Richmond/San Pablo), EBMUD will conduct a site-specific geotechnical investigation at the Wildcat and San Pablo Creek crossings under the direction of a geotechnical engineer before final design of the proposed pipelines. The investigation will evaluate subsurface conditions related to the potential for geological and seismic hazards, including ground shaking as well as liquefaction and related phenomena such as lateral spreading and settlement. The geotechnical report will include recommendations regarding the seismic design of the pipeline at the Wildcat Creek crossing and the pipe bridge at San Pablo Creek to comply with current seismic standards and to withstand geologic and seismic hazards. These recommendations will be included in the project design and incorporated into project construction specifications, for implementation.

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**Impact 3.7-3: Seismic Ground shaking (applies to all pipelines).**

Ground shaking is the most widespread effect of earthquakes and poses a greater seismic threat than local ground rupture. Depending on the level of ground shaking, an earthquake could damage pipelines, resulting in a disruption of water service. Such damage could result in short-term, temporary service interruptions for inspections and repairs, and long-term repairs could also be required.

As discussed in the Setting section, ground shaking during an earthquake, measured as peak ground accelerations, are expected to be quite strong along each pipeline alignment, in the range of 0.68 to 0.78 g. This level of shaking could be sufficient to result in pipeline breakage without proper design of the pipelines. However, underground pipelines are generally less susceptible to damage from strong ground shaking than aboveground facilities where they are imbedded in structural fill as the majority of the pipelines would be. This, combined with construction of the pipelines in accordance with seismic design standards as described in Impact 3.7-2 would ensure that impacts associated with ground shaking would be *less than significant* except where the Central Pressure Zone Pipeline (Richmond/San Pablo) would cross San Pablo Creek.

At the San Pablo Creek crossing, the pipeline would be more susceptible to damage from ground shaking because it would span the creek on a pipe bridge, and the bridge supports would be located in banks that are susceptible to liquefaction. Therefore impacts related to seismic ground shaking would be potentially significant for this portion of the Central Pressure Zone Pipeline (Richmond/San Pablo). Implementation of Mitigation Measure GEO-1, Site-Specific Geotechnical Investigation, which would require a geotechnical investigation to evaluate site-specific ground shaking hazards at the San Pablo Creek Crossing and incorporation of the report's recommendations into the final design, would reduce this impact to a *less-than-significant* level.

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**Impact 3.7-4: Seismically induced landslides (applies to all pipelines).**

Seismically induced slope instability (including landslides, earth flows, and debris flows) could displace or destroy underground pipelines. However, all of the proposed pipelines would be constructed in a relatively flat alluvial plain to the west of the Berkeley Hills. Further, as discussed in the Setting section, the Wildcat Pipeline (Berkeley), Wildcat Pipeline (El Cerrito), and Central Pressure Zone Pipeline (El Cerrito/Richmond) alignments are located in areas mapped as "Few Landslides," which are areas that contain few, if any, large mapped landslides. The Central Pressure Zone Pipeline (Richmond/San Pablo) alignment is in an area mapped as "Flatland," which includes areas of gentle slope at low elevations that have little or no potential for the formation of slumps, landslides, or earth flows, except along stream banks and terrace margins. Therefore, there is a low potential for a seismically induced landslide to occur along any of the pipeline alignments. This impact would be *less than significant*.

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**Impact 3.7-5: Erosion and loss of topsoil (applies to all pipelines).**

The Wildcat Pipeline (Berkeley), Wildcat Pipeline (El Cerrito), Central Pressure Zone Pipeline (El Cerrito/Richmond), and southern portion of the Central Pressure Zone Pipeline (Richmond/San Pablo) would be constructed in paved streets. The pavement would be restored when pipeline installation is completed. Therefore, impacts related to erosion would be restricted to the construction period. During construction, the contractor would be required to implement erosion control measures in accordance with Section 01 35 44 of the EBMUD Master Specifications (described in the Regulatory Setting section), as discussed in Section 3.10, Hydrology and Water Quality. These measures, and additional measures as needed, would be specified in the SWPPP prepared in accordance with the Construction General Stormwater Permit. Implementation of these measures would ensure that geologic impacts related to erosion are *less than significant* for the Wildcat Pipeline (Berkeley), Wildcat Pipeline (El Cerrito), Central Pressure Zone Pipeline (El Cerrito/Richmond), and southern portion of the Central Pressure Zone Pipeline (Richmond/ San Pablo). In addition, construction activities along these pipeline alignments would not include the removal of topsoil (a fertile soil horizon that typically contains a seed base). Therefore, impacts related to loss of topsoil would also be *less than significant* for these pipeline alignments.

Construction of the pipe bridge at the north end of the Central Pressure Zone Pipeline (Richmond/San Pablo) would take place adjacent to the banks of San Pablo Creek (including Kennedy Park to the south), which is not paved and would not be paved at the completion of construction. Although the contractor would be required to implement Section 01 35 44 of the EBMUD Master Specifications at this location also, there is greater potential for erosion at this location because of the exposed nature of the creek banks, and impacts related to erosion could be significant. Mitigation Measure HYD-1, identified in Section 3.10, Hydrology and Water Quality, would require contractors to schedule construction activities at San Pablo Creek during the dry season (i.e., between June 1 and October 15). Implementation of this measure would reduce this impact to *less than significant* by ensuring that construction would occur during the dry season when there would be less potential for erosion.

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**Impact 3.7-6: Unstable Geologic Unit (Central Pressure Zone Pipeline [Richmond/San Pablo]).**

As discussed in the Setting section, the Central Pressure Zone Pipeline (Richmond/San Pablo) alignment crosses an area of high to very high liquefaction susceptibility associated with the modern stream channel deposits and Latest Holocene-age alluvial fan levee and stream terrace deposits at Wildcat and San Pablo Creeks. Operation of continuous vibratory equipment, such as compactors or sheet pile drivers, could induce liquefaction and related differential settlement in this area, depending on the type, magnitude, and duration of vibration. As discussed in Section 3.11, Noise and Vibration, vibratory construction activities along 23rd Street from about Market Avenue to Road 20 (the northernmost portion of the Central Pressure Zone Pipeline [Richmond/San Pablo]), as well as jack and bore construction beneath Wildcat Creek, would pose the potential for generating differential settlement effects if vibration activities exceed 0.205 in/sec peak particle velocity (PPV)[9] for 0.1 g peak ground acceleration thresholds and 0.410 in/sec PPV for 0.2 g peak ground acceleration thresholds. However, this impact would be reduced to a *less-than-significant* level with implementation of Mitigation Measure NOI-4,

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9 Peak particle velocity is used to describe the level of vibration. It is defined as the maximum instantaneous positive or negative peak of the vibration signal and is used to assess the potential for damage to buildings and structures. Peak particle velocity is expressed in inches per second (in/sec).

Vibration Limits, identified in Section 3.11, which requires implementation of vibration limits to prevent vibration-induced liquefaction.

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**Impact 3.7-7: Expansive Soil (applies to all pipelines).**

Problematic soils, such as expansive and corrosive soils, discussed in the Setting section, can cause damage to buried utilities and can also increase required maintenance. Expansion and contraction of expansive soils in response to changes in moisture content can cause differential and cyclical movements that, in turn, can cause damage and/or distress to structures and equipment. Depending on the degree of corrosivity of subsurface soils, concrete and reinforcing steel in concrete structures and bare-metal structures exposed to these soils can deteriorate, eventually leading to structural failures.

However, the proposed pipelines would generally be constructed beneath existing streets, and as discussed in Impact 3.7-2, the pipelines would be imbedded in compacted structural fill and would be constructed in accordance with seismic design standards. These design measures will ensure that the pipelines can tolerate the effects of expansive soil, if present. Where the proposed Central Pressure Zone Pipeline (Richmond/San Pablo) crosses San Pablo Creek, the pipe bridge footings would be constructed in native soil, which the NRCS has mapped as the Conejo Clay Loam, a soil type that exhibits a moderate shrink-swell capacity. To address geotechnical stability, Mitigation Measure GEO-1 requires a geotechnical investigation to evaluate site-specific hazards and incorporate the recommendations of the geotechnical report into the final design for the pipe bridge. This will ensure an appropriate footing design of the pipe bridge to avoid damage from expansive soil.

To address the potential effects of corrosive soil, if present, a cathodic protection system would be used to protect the proposed pipelines from corrosion, as discussed in the Project Description. Although the pipe bridge across San Pablo Creek would be constructed in the Conejo Clay Loam with a high risk of corrosion to uncoated steel and moderate risk of corrosion to concrete, the pipe bridge would be designed according to standard engineering and geotechnical practices for the identification and remediation of corrosive soil, which would include an appropriate footing design for the pipe bridge to avoid damage from corrosive soil.Therefore, impacts related to expansive and corrosive soil would be *less than significant*.

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# 3.8 Greenhouse Gas Emissions

This section addresses greenhouse gas (GHG) emissions that could result from implementation of the proposed West of Hills Northern Pipelines Project. The Project's GHG emissions are estimated for construction activities only because there would be no GHG emissions associated with operation of pipelines. This analysis qualitatively assesses the Project's consistency with local and statewide GHG reduction policies.

## 3.8.1 Setting

### GHGs and Climate Change

Gases that trap heat in the atmosphere are referred to as GHGs because they capture heat radiated from the sun as it is reflected back into the atmosphere, much like a greenhouse. The most common GHGs are carbon dioxide ($CO_2$) and water vapor ($H_2O$), but there are several others that are important, including methane ($CH_4$), nitrous oxide ($N_2O$), ozone ($O_3$), chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride ($SF_6$).

While the presence of the primary GHGs in the atmosphere are naturally occurring, $CO_2$, $CH_4$, and $N_2O$ are mainly the result of human activities, which have accelerated the emission rate of these compounds into the earth's atmosphere. Emissions of $CO_2$ are largely by-products of fossil fuel combustion, whereas $CH_4$ results from off-gassing associated with agricultural practices and landfills. $N_2O$ is also associated with agricultural operations such as fertilization of crops. Other GHGs, like hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are generated during certain industrial processes. GHGs are typically reported in "carbon-dioxide-equivalent" measures ($CO_2e$).[1]

There is international scientific consensus that human-caused increases in GHGs have and will continue to contribute to climate change. Potential climate change impacts in California may include, but are not limited to, a decrease in snowpack; sea level rise; and a greater number of extreme heat days per year, high ozone days, large forest fires, and drought years. Secondary effects are likely to include a global rise in sea level, impacts on agriculture, changes in disease vectors, and changes in habitat and biodiversity (California Climate Change Portal, 2011).

### GHG Emissions Summary

The California Air Resources Board (CARB) estimated that in 2009 California produced about 453 million metric tons of $CO_2e$ (MMT $CO_2e$), the lowest level in a decade. The total net emissions between 2000 and 2009 decreased from 459 to 453 MMT $CO_2e$, representing a 1.3 percent decrease from 2000 and a 6.1 percent increase from the 1990 emissions level. CARB has estimated transportation to be the source of 38 percent of the state's total GHG emissions,

1 Because of the differential heat absorption potential of various GHGs, GHG emissions are frequently measured in "carbon-dioxide-equivalents," which represent a weighted average based on the heat absorption (or "climate change") potential of each gas. This allows the total GHG emissions resulting from a project or activity to be expressed as a single number that represents the total carbon footprint resulting from that project or activity.

followed by electricity generation (both in-state and out-of-state) (23 percent) and industrial sources (about 20 percent). Commercial and residential fuel use (primarily for heating) account for 9 percent of the state's total GHG emissions (CARB, 2011).

In the Bay Area, fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) and the industrial and commercial sectors are the two largest sources of GHG emissions, each accounting for approximately 36 percent of the Bay Area's 95.8 MMT $CO_2e$ emitted in 2007. Electricity generation accounted for approximately 16 percent of the Bay Area's GHG emissions, followed by residential fuel usage at 7 percent, off-road equipment at 3 percent, and agriculture at 1 percent (BAAQMD, 2010).

# 3.8.2 Regulatory Setting

## Federal Regulations

There are no federal regulations or requirements pertaining to GHG emissions that apply to the proposed Project.

## State Regulations

**Global Warming Solutions Act (Assembly Bill 32).** In 2006, the California legislature passed the Global Warming Solutions Act, or Assembly Bill (AB) 32 (California Health and Safety Code Division 25.5, Sections 38500 et seq.). AB 32 requires CARB to design and implement emission limits, regulations, and other feasible and cost-effective measures to ensure that statewide GHG emissions will be reduced to 1990 levels by 2020 (representing a 25percent reduction in emissions).

**California Climate Change Scoping Plan.** In December 2008, pursuant to AB 32, CARB adopted the *California Climate Change Scoping Plan*, which outlines measures to attain the 2020 GHG reduction limits. To meet these goals, California must reduce its GHG emissions by 30 percent below projected 2020 business-as-usual emissions levels, or about 15 percent from today's levels (CARB, 2010a). The Scoping Plan estimates a reduction of 174MMT $CO_2e$ (about 191 million U.S. tons) from the transportation, energy, agriculture, forestry, and high climate-change-potential sectors (see **Table 3.8-1**).

AB 32 also anticipates that local government actions will result in reduced GHG emissions. CARB has identified a GHG reduction target of 15 percent from current levels for local governments, noting that successful plan implementation relies on the authority of local governments to plan, zone, approve, and permit land development to accommodate population growth and the changing needs of their jurisdictions. Decisions on how land is used will have large impacts on GHG emissions reductions from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas sectors.

**TABLE 3.8-1**
**CALIFORNIA CLIMATE CHANGE SCOPING PLAN –ESTIMATED GHG REDUCTIONS**

| **Sector** | **Estimated GHG Reduction by 2020 ($MMT\ CO_2e$)** |
|---|---|
| *Estimated Reductions Resulting from the Combination of Cap-and-Trade Program and Complementary Measures* | *146.7* |
| - Transportation Sector (Vehicle Emission Standards, Low Carbon Fuel Standard, Regional Transportation-related GHG Targets,[a] Vehicle Efficiency Measures Goods Movement, Medium/Heavy Duty Vehicle Efficiency Measures, High-Speed Rail) | 62.3 |
| - Energy Efficiency | 26.3 |
| - Renewables Portfolio Standard (33% by 2020) | 21.3 |
| - Solar Roofs | 2.1 |
| - Industrial Measures | 0.3 |
| - Additional Reductions Needed to Achieve the GHG Cap | 34.4 |
| *Estimated Reductions from Uncapped Sources/Sectors* | *27.3* |
| - High Global Warming Potential Gas Measures | 20.2 |
| - Sustainable Forests | 5.0 |
| - Industrial Measures (for sources not covered under cap-and-trade program) | 1.1 |
| - Recycling and Waste (landfill methane capture) | 1.0 |
| *Total Reductions Counted Towards 2020 Target* | *174* |
| Other Recommended Measures | |
| State Government Operations | 1–2 |
| Local Government Operations | TBD |
| Green Buildings | 26 |
| Recycling and Waste (Mandatory Commercial Recycling, Other Measures) | 9 |
| Water Sector Measures | 4.8 |
| Agriculture – Methane Capture at Large Dairies | 1 |

NOTES:
[a] Reductions from regional transportation-related GHG targets (21.4 MMT $CO_2e$) are an estimate of what may be achieved from local land use changes. CARB will establish regional targets for each Metropolitan Planning Organization region following the input of the Regional Targets Advisory Committee and a public consultation process with MPOs and other stakeholders.

MMT $CO_2e$ = million metric tons of carbon dioxide equivalent

SOURCE: CARB, 2009.

**Low Carbon Fuel Standard.** The Low Carbon Fuel Standard (LCFS) requires fuel providers in the state to decrease lifecycle fuel carbon intensity by 2020. It is expected that the LCFS will reduce tailpipe carbon emissions from passenger vehicles and heavy duty trucks by 10 percent by 2020. CARB identified specific eligibility criteria in April 2009, and implementation is beginning in 2012 (CARB, 2012b).

**Assembly Bill 1493.** AB 1493, known as the Pavley Bill, directed CARB to adopt regulations to reduce emissions from new passenger vehicles. On June 30, 2009, the U.S. EPA granted California the authority to implement GHG emission reduction standards for new passenger cars, pickup trucks, and sport utility vehicles. On September 24, 2009, the ARB adopted amendments to the "Pavley" regulations that reduce GHG emissions in new passenger vehicles from 2009 through 2016 (CARB, 2010b).

**Senate Bill 1078 (Renewable Portfolio Standard).** California's Renewable Portfolio Standard (RPS) was established in 2002 under SB 1078 and accelerated in 2006 under SB 107. Under AB 32, the Renewable Portfolio Standard requires increased production of energy from renewable sources, like solar, wind, geothermal, and biomass generation. Electricity providers must increase their renewable portfolio by 1 percent each year until reaching 20 percent by 2010, and 33 percent by 2020.

**Senate Bill 375.** In 2008, SB 375 was enacted to address indirect GHG emissions caused by urban sprawl. SB 375 enhances CARB's ability to reach the goals of AB 32 by directing the agency to develop regional GHG emission reduction targets to be achieved from the land use and transportation sector for 2020 and 2035.SB 375 develops emissions-reduction goals that regions can apply to planning activities.

**Senate Bill 97.** Recognizing that AB 32 did not discuss how GHGs should be addressed in documents prepared under CEQA, the legislature enacted SB 97 to require the Governor's Office of Planning and Research (OPR) to develop and adopt CEQA guidelines for the mitigation of emissions. The draft guidelines were formalized on March 18, 2010, and all CEQA documents prepared after this date are required to comply with the OPR-approved amendments to the CEQA Guidelines. The GHG impact analysis presented below is consistent with the amended Guidelines.

## Local Policies

**Bay Area Air Quality Management District CEQA Guidelines.** The BAAQMD is the primary agency with direct and indirect regulatory authority over sources of air pollution in the San Francisco Bay Area Air Basin, which includes the project area. As part of its role in air quality regulation, BAAQMD prepares guidelines and procedures to assist lead agencies in evaluating a project's potential air quality impacts during the CEQA process. In June 2010, BAAQMD adopted new CEQA thresholds of significance for operational GHG impacts, which were not previously included in the BAAQMD CEQA Guidelines. BAAQMD has not defined quantitative GHG thresholds for construction activities. However, subsequent litigation on the adopted thresholds resulted in a decision by the Alameda County Superior Court on March 5, 2012 that the BAAQMD failed to comply with CEQA when it adopted the thresholds. The court did not rule on the merits of the BAAQMD's thresholds but found that the adoption of the thresholds was a project under CEQA. The court issued a writ of mandate ordering the District to set aside the thresholds and cease dissemination of them until the Air District had complied with CEQA. These thresholds have since been removed from the BAAQMD's CEQA Guidelines. However, the technical analysis conducted by BAAQMD provides substantial evidence to support the use of these thresholds (BAAQMD, 2009).The GHG thresholds for projects and plans are based on meeting the statewide AB 32 GHG emissions reduction targets established by the CARB.

**Bay Area Air Quality Management District Climate Protection Program.** On June 1, 2005 the BAAQMD Board of Directors adopted a resolution establishing a Climate Protection Program and acknowledging the link between climate protection and programs to reduce air pollution in the Bay Area. A central element of the BAAQMD's Climate Protection Program is the integration of climate protection activities into existing BAAQMD programs.

**EBMUD Mitigation Action Plan.** In 2008, EBMUD adopted a sustainability policy focusing on using resources (economic, environmental, and human) in a responsible manner that meets current needs without compromising the ability to meet future needs. This approach minimizes waste and conserves energy and natural resources. EBMUD's Climate Mitigation Action Plan provides guidance for reducing EBMUD's reliance on fossil fuels, as well as impacts on climate change. EBMUD's goal is to reduce GHG emissions by 10 percent (as compared to baseline GHG emissions in year 2000) by 2015. EBMUD has cut GHG emissions 6 years ahead of schedule. In 2010, the reduction was 13,300 metric tons compared to the baseline. EBMUD tracks GHG emissions per the California Climate Action Registry protocols (EBMUD, 2012).

## 3.8.3 Impacts and Mitigation Measures

### Significance Criteria

For the purposes of this EIR and consistent with Appendix G of the CEQA Guidelines, the West of Hills Northern Pipelines Project is considered to have a significant impact on GHG emissions if it would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

### Approach to Analysis

The GHG emissions analysis considers construction and operational impacts associated with the proposed pipeline Projects. Pursuant to SB 97, the CEQA Guidelines were amended to require determination of the significance of a project's direct and indirect GHG emissions based on any applicable threshold of significance, and whether a project's emissions would conflict with any applicable GHG reduction plans, policies, or regulations. These two criteria are considered under Impacts 3.8-1 and 3.8-2 below.

BAAQMD's 2010 Guidelines include a GHG threshold of significance for operational emissions but none for construction. However, BAAQMD recommends a case-by-case consideration of construction GHG emissions and encourages lead agencies to incorporate Best Management Practices (BMPs) to reduce GHG emissions during construction, as feasible and applicable. BMPs could include, but are not limited to: using alternative fueled (e.g., biodiesel, electric) construction vehicles/equipment for at least 15 percent of the fleet; using at least 10 percent local building materials; and recycling or reusing at least 50 percent of construction waste or demolition materials (BAAQMD, 2012).

The impact analysis in this section estimates GHG emissions that would be emitted during project construction, and then compares them to BAAQMD's 2010 Guidelines operational significance thresholds. Since there are no construction-related thresholds to apply, construction-related emissions are averaged over a conservative 30-year lifetime of each pipeline Project and then compared to BAAQMD's operational threshold) of 10,000 metric tons (MT) of $CO_2$e per year for stationary sources or 1,100 MT of $CO_2$e per year for mobile sources (BAAQMD, 2009).

## Impacts and Mitigation Measures

**Impact 3.8-1: Project construction-related GHG emissions would not result in a significant impact on climate change or conflict with applicable greenhouse gas reduction plans, policies, or regulations (applies to all pipelines).**

Project construction activities associated with each pipeline are estimated to occur over approximately 12 months or less, and the resulting exhaust emissions from construction equipment, on-road trucking, and construction worker commute traffic during this period are expected to contribute minimally to long-term regional increases in GHGs. **Table 3.8-2** presents the Project's estimated annual construction-related emissions. For purposes of this analysis, construction of each pipeline is assumed to occur within a single calendar year (2015 for both segments of the Wildcat Pipeline and 2021 for both segments of the Central Zone Pipeline) although activities may actually be spread over a two-year period (which would result in lower daily emissions).

**TABLE 3.8-2**
**ESTIMATED ANNUAL CONSTRUCTION-RELATED GHG EMISSIONS**

| Project Component | Duration | $CO_2$e (Short Tons) | $CO_2$e (Metric Tons, MT) |
|---|---|---|---|
| Wildcat Pipeline (Berkeley) – 2015 | 20 weeks | 149 | 135 |
| Wildcat Pipeline (El Cerrito) – 2015 | 27 weeks | 236 | 212 |
| **Wildcat Pipeline Total (2015)** | | **385** | **347** |
| Central Pressure Zone Pipeline (El Cerrito/Richmond) - 2021 | 30 weeks | 222 | 200 |
| Central Pressure Zone Pipeline (Richmond/San Pablo*) – 2021 | 36 weeks | 339 | 305 |
| **Central Pressure Zone Pipeline Total (2021)** | | **561** | **505** |

NOTE: When $CO_2$ and non-$CO_2$ GHG emissions are considered together, they are referenced as $CO_2$e, which add approximately 0.9 percent to $CO_2$ emissions from diesel equipment exhaust (CCAR, 2009).

* Inclusive of bridge crossings and jack and bore activities

MT $CO_2$e = metric ton carbon dioxide equivalent

SOURCE: RoadMod Output (see Appendix F)

As indicated in the table, construction activities associated with both segments of the Wildcat Pipeline would generate up to 347MT $CO_2$e in the peak year, while up to 505 MT $CO_2$e would be generated in the peak year for both segments of the Central Zone Pipeline.[2] Worst-case emissions associated with project construction would represent approximately 0.00018 percent of total annual GHG emissions for the state,[3] and approximately 0.0009 percent of total annual GHG emissions for the entire Bay Area.[4] The contribution of GHG emissions from the Project would be extremely small in terms of both the statewide and Bay Area annual GHG emissions. Emissions would not exceed BAAQMD's operational GHG significance threshold of 1,100 MT $CO_2$e per year. Although this threshold would not apply to construction-related emissions, it is an indicator that the Project's construction-related emissions would be *less than significant*. When averaged over a conservative 30-year lifespan for the pipeline projects, the average annual GHG emissions associated with all project construction activities would equate to approximately 28 MT of $CO_2$ emissions per year. Further, GHG emissions would be temporary in nature, would be limited to the construction period (2015-2017 for the Wildcat Pipelines in Berkeley and El Cerrito and 2021-2022 for the Central Pressure Zone Pipelines in El Cerrito/Richmond and Richmond/San Pablo) and would not continue after completion of project construction. For these reasons, project construction would not conflict with state AB 32 goals and EBMUD's Climate Mitigation Action Plan.

Neither the state nor BAAQMD has adopted a methodology or quantitative threshold, such as those that exist for criteria pollutants, that can be applied to a construction project to evaluate the significance of an individual project's construction-related contribution to GHG emissions. Although BAAQMD's CEQA Guidelines do not specify thresholds of significance for construction-related GHG emissions, they do encourage incorporation of BMPs to reduce GHG emissions during construction, as applicable, such as ensuring that at least 15 percent of the construction fleet is comprised of alternatively fueled (e.g., biodiesel, electric) construction vehicles/equipment; using at least 10 percent local building materials; and recycling or reusing at least 50 percent of construction waste or demolition materials. Consistent with these BMPs, EBMUD proposes to use excavated material as backfill where feasible, thereby minimizing GHG emissions associated with construction haul trucks and solid waste disposal.

Although no mitigation is necessary, implementation of Mitigation Measure AIR-1, which includes idling restrictions specified in Title 13 of the California Code of Regulations, Section 2485, would limit criteria pollutant emissions and, in turn, reduce construction-related GHG emissions. For these reasons, project construction would not conflict with state AB 32 goals related to the reduction of GHG emissions. Therefore, this impact would be *less than significant*.

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[2] Construction of each pipeline Project is assumed to occur in a single calendar year at a rate of 200 feet per day.

[3] CARB (2011) reported net statewide GHG emissions in 2009 at approximately 453 MMT $CO_2$e.

[4] BAAQMD (2010a) reported regional Bay Area GHG emissions in 2007 at approximately 95.8 MMT $CO_2$e.

**Impact 3.8-2: Project operational GHG emissions would not result in a significant impact on climate change or conflict with applicable greenhouse gas reduction plans, policies, or regulations (applies to all pipelines).**

Following completion of Project pipelines, operational and maintenance practices for the water distribution network would remain the same, which would include periodic maintenance of pipelines. GHG emissions associated with this maintenance traffic would be similar to existing levels. Therefore, this impact would be *less than significant*.

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# 3.9 Hazards and Hazardous Materials

This section provides an assessment of potential impacts related to hazards and hazardous materials that could be present in the vicinity of the proposed pipelines, referred to as the project site. Potential hazards addressed in this section include exposure to hazardous materials in soil and groundwater during construction, releases of hazardous materials during construction and operation, as well as hazards related to subsurface utilities, airports and wildfires. Refer to Section 3.3, Air Quality, for discussion of toxic air contaminants.

## 3.9.1 Setting

This section describes the existing conditions of the project area with respect to hazards and hazardous materials. It identifies hazardous materials sites in the project vicinity that may have caused contamination of soil or groundwater at the project site, naturally occurring asbestos, subsurface utilities, local airports, and wildfire hazards.

### Definition of Hazardous Materials

The term "hazardous materials" refers to both hazardous substances and hazardous wastes. Under federal and state laws, any material, including wastes, may be considered hazardous if it is specifically listed by statute as such or if it is toxic (causes adverse human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases). The term "hazardous material" is defined as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment.[1]

If improperly handled, hazardous materials and wastes can cause public health hazards when released to the soil, groundwater, or air. The four basic exposure pathways through which an individual can be exposed to a chemical agent include: inhalation, ingestion, bodily contact, and injection. Exposure can come as a result of an accidental release during transportation, storage, or handling of hazardous materials. Disturbance of subsurface soil during construction can also lead to exposure of workers or the public from stockpiling, handling, or transportation of soils contaminated by hazardous materials from previous spills or leaks.

### Hazardous Materials in Soil and Groundwater

This section assesses the potential to encounter hazardous materials in soil and groundwater as a result of previously documented releases of hazardous materials on the project site or in the nearby area. This discussion of documented releases is based on the results of regulatory agency database searches using the California State Water Resources Control Board (SWRCB) GeoTracker database (SWRCB, 2012) and the California Department of Toxic Substances Control (DTSC) EnviroStor database (DTSC, 2012). The GeoTracker database includes the following hazardous materials site

1 State of California, Health and Safety Code, Chapter 6.95, Section 25501(o).

lists: leaking underground storage tank (LUST) cleanup sites; spills, leaks, investigation and cleanup (SLIC) sites; permitted underground storage tank (UST) facilities; land disposal sites; military cleanup sites; and other cleanup sites. The EnviroStor database includes: federal Superfund; state response; voluntary cleanup; school cleanup; and hazardous waste corrective action sites. **Table 3.9-1** identifies the listed facilities within ¼-mile of the project site and provides a brief summary of the reason listed, the contaminant of concern, and the current regulatory agency status. **Figure 3.9-1** shows the location of the listed facilities and the proposed pipelines. The vast majority of the 97 facilities that were identified from the database search are LUST cleanup sites with known releases of petroleum hydrocarbons in soil and/or groundwater.

## Potential Presence of Naturally Occurring Asbestos

Asbestos is a common name for a group of naturally occurring fibrous silicate minerals that are made up of thin but strong, durable fibers. Asbestos is a known carcinogen and presents a public health hazard if it is present in the friable (easily crumbled) form. Naturally occurring asbestos would most likely be encountered in Franciscan ultramafic rock[2] (primarily serpentinite[3]) or Franciscan mélange.[4] No portion of the pipeline alignments would be located in areas where these bedrock units have been identified; however, potentially ultramafic rock has been mapped in close proximity to the Wildcat Pipeline (Berkeley) (USGS, 1996) and the Central Pressure Zone Pipeline (El Cerrito/Richmond) (USGS, 1994). These areas include sheared Franciscan Complex rocks and greenstone. These areas are located on Pleistocene age alluvial fan deposits or artificial fills that are derived at least partly from these Franciscan Complex bedrock units and could also contain naturally occurring asbestos.

## High Priority Subsurface Utility Lines

High priority subsurface facilities include high-pressure natural gas pipelines, petroleum pipelines, pressurized sewage pipelines, high voltage electric, fiber optic communication, and major water lines. Known high priority facilities in the vicinity of proposed pipelines are presented in **Table 3.9-2** and shown on Figure 3.9-1.

## Wildfire Hazards

California's Public Resources Code (PRC) 4201-4204 and Government Code 51175-89 direct the California Department of Forestry and Fire Protection (CAL FIRE) to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones (FHSZ), define the application of various mitigation strategies to reduce risk associated with wildland fires. Based upon fire hazard mapping by CAL FIRE, the proposed Project area is not located within designated high fire hazards areas in the vicinity, which are shown on Figure 3.9-1 (CAL FIRE, 2008; CALFIRE, 2009).

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2 Ultramafic rocks are formed in high-temperature environments well below the surface of the earth.

3 Serpentine is a naturally occurring group of minerals that can be formed when ultramafic rocks are metamorphosed during uplift to the earth's surface. Serpentinite is a rock consisting of one or more serpentine minerals. This rock type is commonly associated with ultramatic rock along earthquake faults. Small amounts of chrysotile asbestos, a fibrous form of serpentine minerals, are common in serpentinite.

4 Mélange is a mixture of rock materials of differing sizes and types typically contained within a sheared matrix.

**TABLE 3.9-1**
**HAZARDOUS MATERIALS RELEASE SITES IDENTIFIED WITHIN 1/4 MILE OF THE PROJECT SITE**

| Business Name | Number | Street Name | City | Case Type | Status | Substance |
|---|---|---|---|---|---|---|
| Central Pressure Zone Pipeline (El Cerrito/Richmond) | | | | | | |
| Commercial | 10879 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Diesel |
| Chevron | 11690 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Mifune Property | 10793 | San Pablo Ave | Richmond | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| BEST GAS And Car Wash | 10602 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Chevron | 11319 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Civic Center Plaza Apartments | 10940 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| McDermott Property | 10002 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Open - Site Assessment | Diesel, Gasoline, Waste Oil / Motor / Hydraulic / Lubricating |
| McDonalds | 11821 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Della Zoppa Property | 12284 | San Pablo Ave | Richmond | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Doherty's Rental | 10895 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Chevron | 4838 | Macdonald Ave | Richmond | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Oishi Nursery | 130 | 47th St South | Richmond | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Mohawk Getty Oil | 3201 | Carlson Blvd | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| BP #11149 (Former) | 12319 | San Pablo Ave | Richmond | LUST Cleanup Site | Open - Remediation | Gasoline |
| Pay N Pak Store #229 | 1711 | Eastshore Blvd | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Saki Brothers Rose Company | 99 | 47th St South | Richmond | LUST Cleanup Site | Completed - Case Closed | Diesel |
| Target | 11402 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Tosco | 3160 | Carlson Blvd | El Cerrito | LUST Cleanup Site | Open - Verification Monitoring | Gasoline, Waste Oil / Motor / Hydraulic / Lubricating, Other Solvent or Non-Petroleum Hydrocarbon, * Solvents |
| Silverman/San Pablo Avenue Investors Properties | | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Diesel, Waste Oil / Motor / Hydraulic / Lubricating, Tetrachloroethylene (PCE) |
| Val Strough Honda | 11820 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Checker Tune Up | 11847 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Home Depot | | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Diesel |
| Unocal | 11615 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Diesel |
| Gan Property | 10392 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| R & P Service | 11687 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Open - Remediation | Gasoline |
| Chevron | 10192 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Busy Bee Cleaners In The Bishop Center | | San Pablo Ave | El Cerrito | Cleanup Program Site | Completed - Case Closed | Tetrachloroethylene (PCE), Trichloroethylene (TCE) |
| El Cerrito Redevelopment Agency | 1718 | Eastshore Blvd | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Shell | 11541 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Pacific Imports | 10439 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |

**TABLE 3.9-1 (Continued)**
**HAZARDOUS MATERIALS RELEASE SITES IDENTIFIED WITHIN 1/4 MILE OF THE PROJECT SITE**

| Business Name | Number | Street Name | City | Case Type | Status | Substance |
|---|---|---|---|---|---|---|
| Central Pressure Zone Pipeline (El Cerrito/Richmond) (cont.) | | | | | | |
| City of El Cerrito | 6009 | Potrero Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| West Coast Motors | 12354 | San Pablo Ave | Richmond | LUST Cleanup Site | Open - Site Assessment | Gasoline |
| RC Imports | 6501 | Fairmount Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Waste Oil / Motor / Hydraulic / Lubricating |
| City of El Cerrito Public Safety Building | 10900 | San Pablo Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Arco Service Station | 5001 | Cutting Blvd | Richmond | LUST Cleanup Site | Open - Remediation | Waste Oil / Motor / Hydraulic / Lubricating, Gasoline, Diesel |
| Former Unique Cleaners | 6109 | Potrero Avenue | El Cerrito | Cleanup Program Site | Open - Inactive | Tetrachloroethylene (PCE) |
| Macdonald San Pablo Wall 45th Plume | | Wall Ave and 45th Street South | El Cerrito and Richmond | State Response | Backlog | Other |
| Miraflores Housing Development | | South 47th St and Wall Avenue | Richmond | Voluntary Cleanup | Active | Other, Soil |
| Omo Fabricare Dry Cleaners | 12210 | San Pablo Ave | El Cerrito | Evaluation | Inactive - Needs Evaluation | Other, Soil |
| Harbor Plastics Manufacturing Company | 4800 | Bissell Ave | Richmond | Evaluation | Inactive - Needs Evaluation | UE |
| Del Norte Cleaners | 11299 | San Pablo Ave | El Cerrito | Voluntary Cleanup | Active | Other, Soil, Soil Vapor |
| Central Pressure Zone Pipeline (Richmond/San Pablo) | | | | | | |
| Wilson & Kratzer Mortuary | 455 | 24th St | Richmond | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Cadillac Ambulance | 997 | 23rd St | Richmond | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| 7-Eleven Store #22930 | 2500 | Macdonald Ave | Richmond | LUST Cleanup Site | Open - Site Assessment | Gasoline |
| Chevron | 2234 | Macdonald Ave | Richmond | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Arco #2128 | 2230 | Barrett Ave | Richmond | LUST Cleanup Site | Open - Remediation | Gasoline, Waste Oil / Motor / Hydraulic / Lubricating |
| Chevron | 2218 | Market St | San Pablo | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Blue Star Gas & Mini Mart | 850 | 23rd St | Richmond | LUST Cleanup Site | Open - Remediation | Gasoline |
| Port Development | 2005 | Nevin Ave | Richmond | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Richmond Toyota | 516 | 23rd St | Richmond | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Cortese Oldsmobile | 160 | 23rd St | Richmond | LUST Cleanup Site | Completed - Case Closed | Waste Oil / Motor / Hydraulic / Lubricating |
| U Haul | 1017 | 23rd St | Richmond | LUST Cleanup Site | Completed - Case Closed | Diesel |
| AC Transit | 2016 | Macdonald Ave | Richmond | LUST Cleanup Site | Completed - Case Closed | Waste Oil / Motor / Hydraulic / Lubricating |
| Karber's Auto Body | 2323 | Nevin Avenue | Richmond | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Shell | 14290 | San Pablo Ave | San Pablo | LUST Cleanup Site | Completed - Case Closed | Waste Oil / Motor / Hydraulic / Lubricating |

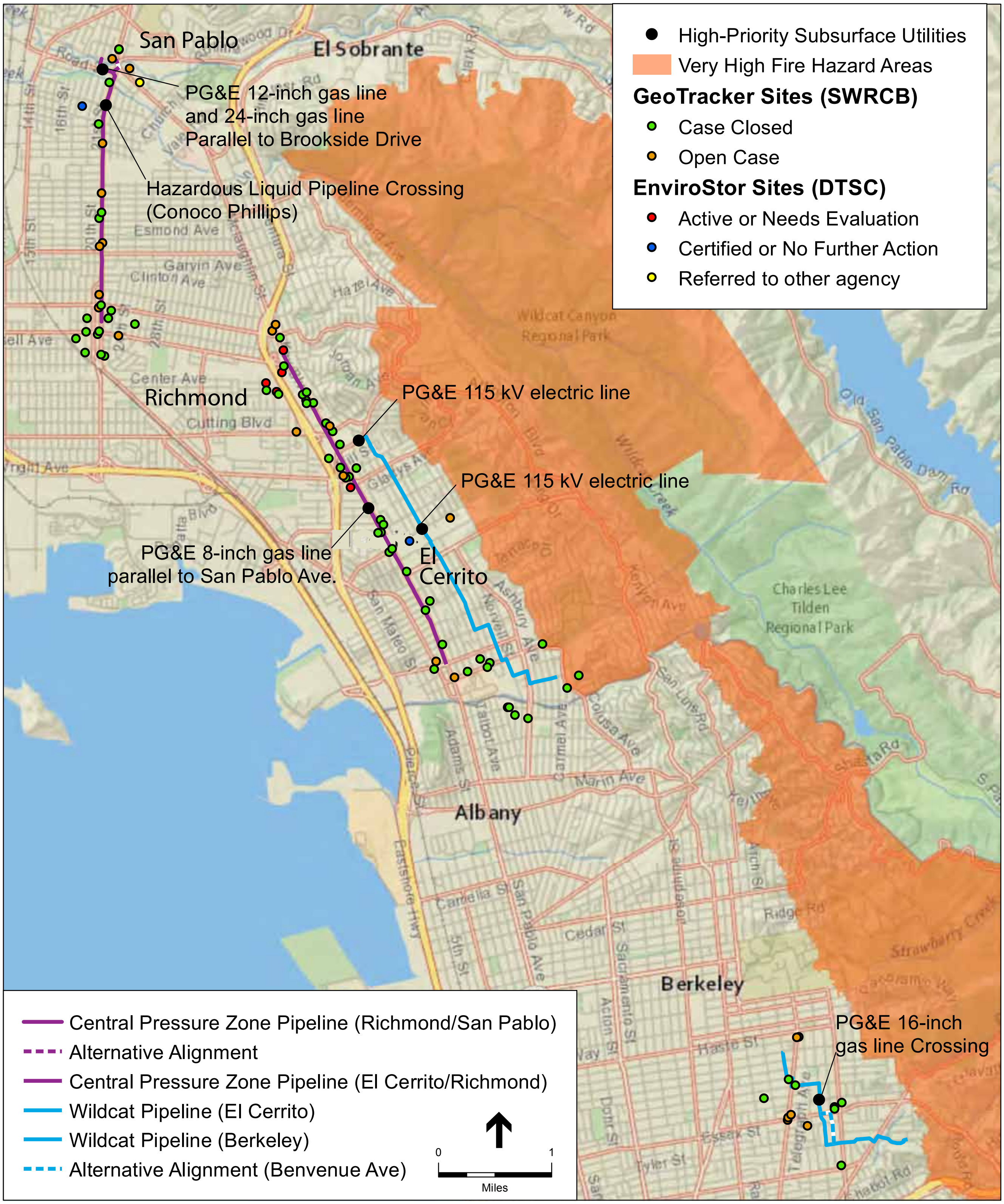
**TABLE 3.9-1 (Continued)**
**HAZARDOUS MATERIALS RELEASE SITES IDENTIFIED WITHIN 1/4 MILE OF THE PROJECT SITE**

| Business Name | Number | Street Name | City | Case Type | Status | Substance |
|---|---|---|---|---|---|---|
| Central Pressure Zone Pipeline (Richmond/San Pablo) (cont.) | | | | | | |
| Modesto Tallow | | Unknown | Richmond | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Former Chevron Site #301949 (9-7093) | 1122 | 23rd St | Richmond | LUST Cleanup Site | Open - Site Assessment | Gasoline, Diesel, Waste Oil / Motor / Hydraulic / Lubricating |
| Vanek Property | 132 | 23rd St | Richmond | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Shell | 831 | 23rd St | Richmond | LUST Cleanup Site | Open - Remediation | Gasoline |
| Chevron | 2025 | 23rd St | San Pablo | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Lou's Produce | 104 | 21st St | Richmond | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Former Petro-Plus/Former Shell Service Station | 14290 | San Pablo Ave | San Pablo | LUST Cleanup Site | Completed - Case Closed | Gasoline, Fuel Oxygenates, Waste Oil / Motor / Hydraulic / Lubricating |
| DWB Partners Property | 14205 | San Pablo Ave | San Pablo | LUST Cleanup Site | Open - Assessment & Interim Remedial Action | Diesel, Gasoline |
| Express Gas | 575 | 23rd St | Richmond | LUST Cleanup Site | Open - Site Assessment | Gasoline |
| Richmond Parkway Project | 2600 | Barrett Ave | Richmond | Cleanup Program Site | Completed - Case Closed | |
| Pacific Bell | 2105 | Macdonald Ave | Richmond | LUST Cleanup Site | Completed - Case Closed | Diesel |
| Juj Site | 234 | U St | San Pablo | Cleanup Program Site | Open - Inactive | |
| Gallo Property | 1440 | 23rd St | San Pablo | LUST Cleanup Site | Open - Remediation | Gasoline, Diesel, Waste Oil / Motor / Hydraulic / Lubricating |
| Dover Elementary School | 1871 | 21st St | San Pablo | School Investigation | No Further Action | None Specified |
| Auto Wrecking Yard (Abandoned) | | Garden Tract Road, West of Parr Blvd | Richmond | Evaluation | Referred to Other Agency | None Specified |
| Pinole Point Steel Co. | 5000 | Giant Road | Richmond | Tiered Permit | Inactive - Needs Evaluation | None Specified |
| Wildcat Pipeline (Berkeley) | | | | | | |
| College Cleaners | 2942 | College Ave | Berkeley | Cleanup Program Site | Open - Inactive | Tetrachloroethylene (PCE) |
| Willard School | 2425 | Stuart St | Berkeley | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Cal Cleaners | 2531 | Telegraph Ave | Berkeley | Cleanup Program Site | Open - Assessment & Interim Remedial Action | Tetrachloroethylene (PCE) |
| Wright's Automotive | 2629 | Ashby Ave | Berkeley | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Fukunaga Property | 2227 | Oregon St | Berkeley | LUST Cleanup Site | Completed - Case Closed | Heating Oil / Fuel Oil |
| Tosco - Facility #0852 | 3001 | Telegraph Ave | Berkeley | LUST Cleanup Site | Open - Inactive | Gasoline |
| College Cleaners | 2942 | College Ave | Berkeley | LUST Cleanup Site | Completed - Case Closed | Tetrachloroethylene (PCE), Heating Oil / Fuel Oil, Stoddard Solvent / Mineral Spirits / Distillates |
| Ripsteen Property | 3170 | College Ave | Berkeley | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Tony & John's Foreign Cars | 2730 | Telegraph Ave | Berkeley | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Chevron Service Station | 2996 | Telegraph Ave | Berkeley | LUST Cleanup Site | Open - Remediation | Gasoline |
| Alta Bates Hospital | 3001 | Colby St | Berkeley | LUST Cleanup Site | Open - Site Assessment | Diesel |

**TABLE 3.9-1 (Continued)**
**HAZARDOUS MATERIALS RELEASE SITES IDENTIFIED WITHIN 1/4 MILE OF THE PROJECT SITE**

| Business Name | Number | Street Name | City | Case Type | Status | Substance |
|---|---|---|---|---|---|---|
| Wildcat Pipeline (Berkeley) (cont.) | | | | | | |
| Chevron | 2996 | Telegraph Ave | Berkeley | LUST Cleanup Site | Open - Remediation | Gasoline |
| Former Cal Cleaners | 2529-2533 | Telegraph Ave | Berkeley | Evaluation | Refer: Other Agency | None Specified |
| Wildcat Pipeline (El Cerrito) | | | | | | |
| Sunset View Cemetery | 101 | Colusa Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Emporium Capwell | 1 | El Cerrito Plaza | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Diesel |
| Equity Property Management | 370 | Colusa Cir | Kensington | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| City of Albany Corp Yard | 507 | San Gabriel | Albany | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| P G & E - El Cerrito G Substation | 7140 | Schmidt Lane | El Cerrito | Cleanup Program Site | Open - Inactive | None Specified |
| Albany High School | 603 | Key Route Blvd | Albany | LUST Cleanup Site | Completed - Case Closed | Diesel |
| Hill Lumber Company | 1259 | Brighton Ave | Albany | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Plaza Auto Service | 6801 | Fairmount Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| Albany Unified School District | 1259 | Brighton Ave | Albany | Cleanup Program Site | Completed - Case Closed | None Specified |
| Mobil | 6700 | Fairmount Ave | El Cerrito | LUST Cleanup Site | Completed - Case Closed | Gasoline |
| EBMUD San Pablo Filter Plant | 300 | Berkeley Park Blvd | Kensington | LUST Cleanup Site | Completed - Case Closed | Diesel |
| El Cerrito Mill and Lumber | 10812 | San Pablo Ave | El Cerrito | Voluntary Cleanup | Certified | Other, Soil |

SOURCE: SWRCB GeoTracker, 2012; DTSC EnviroStor, 2012.




SOURCES: SWRCB, GeoTracker 2012; DTSC, EnviroStor 2012
CAL FIRE, Fire Hazard Severity Zones, 2009
EBMUD, High Priority Subsurface Facilities, 2012



**Figure 3.9-1**
Hazardous Materials Sites and Subsurface Utilities within a 1/4-mile of the Project, and Very High Fire Hazard Severity Zones

**TABLE 3.9-2**
**HIGH PRIORITY FACILITIES IN THE PROJECT AREA**

| Alignment | Utility | Location |
|---|---|---|
| Wildcat Pipeline (Berkeley) | PG&E 16-inch gas line | Crosses alignment at the intersection of Russell Street and Hillegass Avenue |
| Wildcat Pipeline (El Cerrito) | PG&E 115 kV electric line | Crosses alignment at the intersection of Richmond Street and Schmidt Lane and intersection of Hill Street and Liberty Street. |
| Central PZ Pipeline (El Cerrito/ Richmond) | PG&E 8-inch gas line | Parallel to alignment in San Pablo Avenue along the east side of the median. The new pipeline is planned for the west side of the median. |
| Central PZ Pipeline (Richmond/San Pablo) | Hazardous liquid pipeline owned by Conoco Philips | Crosses alignment at the intersection of 23rd Street and Dover |
| Central PZ Pipeline (Richmond/San Pablo) | PG&E 12-inch gas line and 24-inch gas line | Parallel to alignment in Brookside Drive. |

SOURCE: EBMUD, 2012.

### Airports

The nearest public airport to the Project is Oakland International Airport, located approximately ten miles south of the Wildcat (Berkeley) Pipeline alignment. No private airstrips occur in the project vicinity.

### Schools and Day Care Centers

As identified in Table 3.3-3, Air Quality, there are approximately 26 schools and day care centers located within ¼-mile of proposed Project.

## 3.9.2 Regulatory Framework

This section describes the federal, state and local laws, regulations and policies related to the handling, storage, disposal and transportation of hazardous materials, wildfire hazards, and emergency response.

### Federal Regulations

#### *Comprehensive Environmental Response and Liability Act. Superfund Amendments and Reauthorization Act of 1986 (42 USC Section 9601 et seq.)*

The Comprehensive Environmental Response and Liability Act, also known as Superfund, provides for the response and cleanup of hazardous substances that may endanger public health or the environment. The Superfund Amendments and Reauthorization Act (SARA) amended Superfund to increase state involvement and required Superfund actions to consider state environmental laws and regulations. The applicable part of SARA is Title III, otherwise known as the Emergency Planning and Community Right-To-Know Act of 1986. Title III requires states to establish a process for developing local chemical emergency preparedness programs and to receive and disseminate information on hazardous substances present at facilities in local communities. The law provides primarily for planning, reporting, and notification concerning hazardous substances. Key provisions require that companies submit a list of hazardous materials stored to the local fire department and emergency planning agencies, provide notification when extremely hazardous substances are present above their threshold planning quantities, and immediately report to the state emergency response commission when a hazardous material is released in excess of its reportable quantity.

### *Clean Air Act (42 USC 7401 et seq. as amended)*

Regulations under the Clean Air Act are designed to prevent accidental releases of hazardous materials. The regulations require facilities that store a threshold quantity or greater of listed regulated substances to develop a risk management plan, including hazard assessments and response programs to prevent accidental releases of listed chemicals.

### *Toxic Substances Control Act (15 USC 2605)/Resource Conservation and Recovery Act (42 USC 6901 et seq.)/Hazardous and Solid Waste Act*

The Federal Toxic Substances Control Act (1976) and the Resource Conservation and Recovery Act of 1976 established a program administered by the U.S. EPA for the regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste. The Resource Conservation and Recovery Act was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the “cradle to grave” system of regulating hazardous wastes.

### *U.S. Department of Transportation. Hazardous Materials Transport Act (49 USC 5101)*

The U.S. Department of Transportation, in conjunction with the U.S. EPA, is responsible for enforcement and implementation of federal laws and regulations pertaining to the transportation of hazardous materials. The Hazardous Materials Transportation Act of 1974 directs the U.S. Department of Transportation to establish criteria and regulations regarding the safe storage and transportation of hazardous materials. The regulations, set forth in the Code of Federal Regulations (CFR) 49, Section 171–180, define the types of material considered hazardous, the marking of vehicles transporting hazardous materials, and other requirements.

### *Occupational Safety and Health Administration, Title 29 CFR 1910*

The Occupational Safety and Health Administration’s (OSHA’s) mission is to ensure the safety and health of America’s workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health. The OSHA staff establishes and enforces protective standards and reaches out to employers and employees through technical assistance and consultation programs.

## State Regulations

### *Health and Safety Code, Section 25249.5 et seq. Safe Drinking Water and Toxics Enforcement Act, Proposition 65*

The Safe Drinking Water and Toxics Enforcement Act of 1986 identifies chemicals that cause cancer and reproductive toxicity, provides information for the public, and prevents discharge of the chemicals into sources of drinking water. Lists of the chemicals of concern are published and updated periodically. Businesses are required to notify Californians about the chemicals in products they purchase, in the workplace, or that are released to the environment. By providing this information, individuals are able to make informed decisions about protecting themselves from exposure to these chemicals.

### *Health and Safety Code, Section 25270, Aboveground Petroleum Storage Act*

Health and Safety Code Sections 25270 to 25270.13 ensure compliance with the federal Clean Water Act. The Aboveground Petroleum Storage Act applies to facilities that operate a petroleum aboveground storage tank with a capacity greater than 660 gallons or combined aboveground storage tanks capacity greater than 1,320 gallons or oil-filled equipment where there is a reasonable possibility that the tank(s) or equipment may discharge oil in “harmful quantities” into navigable waters or adjoining shore lands. If a facility falls under these criteria, it must prepare a Spill Prevention Control and Countermeasure Plan.

### *Health and Safety Code, Section 25500 et seq.*

Health and Safety Code, Section 25500 et seq. and the related regulations in 19 California Code of Regulations (CCR) 2620, et seq., require local governments to regulate local business storage of hazardous materials in excess of certain quantities. The law also requires that entities storing hazardous materials be prepared to respond to releases. Those using and storing hazardous materials are required to submit a Hazardous Materials Business Plan (HMBP) to their local Certified Unified Program Agency (CUPA) and to report releases to their CUPA and the State Office of Emergency Services.

### *Health and Safety Code, Section 25531 et seq.*

Health and Safety Code, Section 25531 et seq. and the California Accidental Release Program regulate the registration and handling of regulated substances. Regulated substances are any chemicals designated as an extremely hazardous substance by U.S. EPA as part of its implementation of SARA Title III. Health and Safety Code Section 25531 overlaps or duplicates some of the requirements of SARA and the Clean Air Act. Facilities handling or storing regulated substances at or above threshold quantities must register with their local CUPA and prepare a risk management plan.

### *Hazardous Materials Release Response Plans and Inventory Act of 1985*

The Hazardous Materials Release Response Plans and Inventory Act, also known as the Business Plan Act, requires businesses using hazardous materials to prepare a plan that describes their facilities, inventories, emergency response plans, and training programs. Business plans contain basic information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed.

### *Hazardous Waste Control Act*

The Hazardous Waste Control Act created the State hazardous waste management program, which is similar to but more stringent than the federal Resource Conservation and Recovery Act program. The act is implemented by regulations contained in Title 26 of the CCR, which describes the following required aspects for the proper management of hazardous waste: identification and classification; generation and transportation; design and permitting of recycling treatment, storage and disposal facilities; operation of facilities and staff training; and closure of facilities and liability requirements. These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of such waste. Under the Hazardous Waste Control Act and Title 26, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with the DTSC.

### *Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program)*

The Unified Program requires the administrative consolidation of six hazardous materials and waste programs (Program Elements) under one agency, a CUPA. The following Program Elements are consolidated under the Unified Program:

- Hazardous Waste Generator and On-site Hazardous Waste Treatment Programs (a.k.a., Tiered Permitting)
- Aboveground Petroleum Storage Tanks
- Hazardous Materials Release Response Plans and Inventory Program (a.k.a. Hazardous Materials Disclosure or “Community-Right-To-Know”)
- California Accidental Release Prevention Program
- UST Program
- Uniform Fire Code Plans and Inventory Requirements

The Unified Program is intended to provide relief to businesses complying with the overlapping and sometimes conflicting requirements of formerly independently managed programs. The Unified Program is implemented at the local government level by CUPAs. Most CUPAs have been established as a function of a local environmental health or fire department. Some CUPAs have contractual agreements with another local agency, a participating agency, which implements one or more Program Elements in coordination with the CUPA.

### Screening Levels for Hazardous Materials in Soil or Groundwater

The RWQCB Environmental Screening Levels (ESLs) are guidelines used to evaluate the potential risk associated with chemicals found in soil or groundwater where a release of hazardous materials has occurred (RWQCB, 2008). ESLs have been established for both residential and commercial/industrial land uses, and also for construction workers. Residential screening levels are the most restrictive; soil with chemical concentrations below these levels generally would not require remediation and would be suitable for unrestricted uses if disposed of offsite. Commercial/industrial screening levels are generally higher than residential screening levels because they are based on potential worker exposure to hazardous materials in the soil (which are generally of shorter duration than residential exposures). Screening levels for construction workers are also higher than for commercial/industrial workers because construction workers are only exposed to the chemical of concern during the duration of construction, while industrial workers are assumed to be exposed over a working lifetime.

The California Environmental Protection Agency (Cal-EPA) California Human Health Screening Levels (CHHSLs) are concentrations of 54 hazardous chemicals in soil or soil gas that Cal-EPA considers to be below thresholds of concern for risks to human health (Cal-EPA, 2005). The CHHSLs can be used to screen sites for potential human health concerns where releases of hazardous chemicals have occurred. The presence of a chemical at concentrations in excess of a CHHSL does not indicate that adverse impacts are occurring or will occur, but suggests that further evaluation is warranted. The CHHSLs are guidance, and not regulatory cleanup standards.

### Waste Classification Criteria

In accordance with Title 22 of the CCR Section 66261.20 et seq., excavated soil is classified as a hazardous waste if it exhibits the characteristics of ignitability, corrosivity, reactivity, and/or toxicity. A waste is considered hazardous in accordance with 22 CCR 66261.24 if it contains:

- Total concentrations of certain substances at concentrations greater than the Total Threshold Limit Concentration (TTLC);
- Soluble concentrations greater than the Soluble Threshold Limit Concentration (STLC);
- Soluble concentrations of certain substances greater than federal toxicity regulatory levels using the Toxicity Characteristic Leaching Procedure (TCLP); or
- Specified carcinogenic substances at a single or combined concentration of 0.001 percent.

A waste may also be classified as toxic if testing indicates toxicity greater than the specified criteria. Soil that is not classified as a hazardous waste can be accepted at a Class II or Class III designated landfill, depending on the waste acceptance criteria for the specific landfill.

### California Office of Emergency Services

In order to protect the public health and safety and the environment, the California Office of Emergency Services is responsible for establishing and managing statewide standards for business and area plans relating to the handling and release or threatened release of hazardous materials.

Basic information on hazardous materials handled, used, stored, or disposed of (including location, type, quantity, and the health risks) needs to be included in HMBPs and available to firefighters, public safety officers, and regulatory agencies in order to protect the health and safety of persons and the environment from the release of hazardous materials into the workplace and environment. These regulations are covered under Chapter 6.95 of the California Health and Safety Code Article 1–Hazardous Materials Release Response and Inventory Program (Sections 25500 to 25520) and Article 2–Hazardous Materials Management (Sections 25531 to 25543.3).

### Utility Notification Requirements

Title 8, §1541 of the CCR requires excavators to determine the approximate locations of subsurface installations such as sewer, telephone, fuel, electric, and water lines (or any other subsurface installations that may reasonably be encountered during excavation work) prior to opening an excavation. The California Government Code (§4216 et seq.) requires owners and operators of underground utilities to become members of and participate in a regional notification center. According to §4216.1, operators of subsurface installations who are members of, participate in, and share in the costs of a regional notification center are in compliance with this section of the code. Underground Services Alert of Northern California (known as USA North) receives planned excavation reports from public and private excavators and transmits those reports to all participating members of USA North that may have underground facilities at the location of excavation. Members will mark or stake their facilities, provide information, or give clearance to dig (USA North, 2012).

### California Fire Code

The California Fire Code includes specific requirements for the safe storage and handling of hazardous materials. These requirements reduce the potential for a release of hazardous materials and for mixing of incompatible chemicals, and specify the following specific design features to reduce the potential for a release of hazardous materials that could affect public health or the environment.

- Separation of incompatible materials with a noncombustible partition.
- Spill control in all storage, handling, and dispensing areas.
- Separate secondary containment for each chemical storage system. The secondary containment must hold the entire contents of the tank, plus the volume of water needed to supply the fire suppression system for a period of 20 minutes in the event of a catastrophic spill.

### California Occupational Safety and Health Administration

Cal-OSHA is the primary state agency responsible for worker safety in the handling and use of chemicals in the workplace. Cal-OSHA standards are generally more stringent than federal regulations. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings.

### California Airborne Toxic Control Measure

The California Air Resources Board (CARB) has adopted an asbestos Airborne Toxic Control Measure (ATCM) for construction, grading, quarrying, and surface mining operations (CARB, 2002). The ATCM requires the use of best available dust mitigation measures to prevent offsite migration of asbestos-containing dust from road construction and maintenance activities, construction and grading operations, and quarrying and surface mining operations in areas of ultramafic rock, serpentine, or asbestos. The Bay Area Air Quality Management District (BAAQMD) oversees implementation of the regulation.

For construction projects located in areas where ultramafic rock (primarily serpentinite) is mapped and that would disturb one acre or less of land, the ATCM requires the site operator to implement standard dust mitigation measures before construction begins, and to maintain each measure throughout the duration of the construction project. For construction activities that would disturb more than one acre of asbestos-containing materials, project sponsors are required to prepare an asbestos dust mitigation plan specifying measures that would be taken to ensure that no visible dust crosses the property boundary. The asbestos dust mitigation plan must be submitted to and approved by the BAAQMD prior to the beginning of construction, and the site operator must ensure the implementation of all measures throughout the construction project. In addition, the BAAQMD could require air monitoring for offsite migration of asbestos dust during construction activities and might change the plan on the basis of the air monitoring results.

### California Highway Patrol

A valid Hazardous Materials Transportation License, issued by the California Highway Patrol, is required by the laws and regulations of State of California Vehicle Code Section 3200.5 for transportation of hazardous materials shipments for which the display of placards is required by State regulations. Additional requirements on the transportation of explosives, inhalation hazards, and radioactive materials are enforced by the California Highway Patrol under the authority of the State Vehicle Code. Transportation of explosives generally requires consistency with additional rules and regulations for routing, safe stopping distances, and inspection stops (Title 14, CCR, Chapter 6, Article 1, Sections 1150-1152.10). Inhalation hazards face similar, more restrictive rules and regulations (Title 13, CCR, Chapter 6, Article 2.5, Sections 1157-1157.8).

## Local Oversight and Policies

### Local CUPA Agencies

Local CUPA agencies in the project area include: the Contra Costa County Health Services Department Hazardous Materials Program, the Alameda County Environmental Services Hazardous Materials/Waste Program, and the City of Berkeley Toxics Management Division. These local agencies are responsible for the following programs under the State's Unified Program:

- Hazardous Materials Business Plans
- Hazardous Waste Generator Program
- Hazardous Waste Tiered Permitting
- Underground Storage Tanks

- Aboveground Petroleum Storage Act
- California Accidental Release Program

## *Other Local Policies*

### City of Berkeley General Plan

The *City of Berkeley General Plan* (City of Berkeley, 2001) includes a number of policies intended to prevent and respond to hazardous materials incidents. These policies are included in the Environmental Management, Transportation, and Disaster Preparedness and Safety elements of the General Plan (Policies EM-7, EM-13, EM-14, T-23, T-28 and S-13). These policies state the City of Berkeley's intention to establish truck routes, provide emergency access routes, control and regulate the use, storage and transport of hazardous materials. Several policies address reducing the risk of hazardous materials exposure through the use of environmental investigations, risk reduction practices and the use of warning systems. Additional policies in the General Plan are intended to encourage a reduction in the quantities of hazardous waste generated in Berkeley.

### City of El Cerrito General Plan

Hazards and hazardous materials policies and actions are included in the Resources and Hazards sections of the *City of El Cerrito General Plan* (City of El Cerrito, 1999). Policies H1.9 through H1.12 govern hazardous material storage and disposal, management, and usage by requiring development review and approval, encouraging use of safer alternative materials, and requiring compliance with all applicable State, Federal and local laws. Policies H1.20 and H1.21 define El Cerrito's Fire Hazard Reduction Program and encourage use of fire retardant landscaping.

### City of Richmond General Plan

The *Richmond General Plan 2030* (City of Richmond, 2011) includes policies and actions governing hazards and hazardous materials within the Public Safety and Noise element (see Goals SN2 and SN2, Policies SN1.3 and SN2.3 and Action SN1.1). These policies state the City of Richmond's intent to minimize the risk of injury, loss of life and property damage from hazards; require the safe production, transport, use and disposal of hazardous materials; and reduce hazardous waste generation to the maximum extent feasible.

### City of San Pablo General Plan

The *San Pablo General Plan 2030* (City of San Pablo, 2011) incorporates policies and actions governing hazards and hazardous materials into the Safety and Noise element (see Goals SN-G-3, SN-G-4, and PSCU-G-8, and Implementing Policies SN-I-20, SN-I-22, and SN-I-23). These goals aim to reduce the risk to the health of San Pablo residents from exposure to hazardous materials and fire hazards. The implementing policies require coordination with appropriate regulatory agencies, conformance with Contra Costa County Hazardous Waste Management Plan standards, and development review to ensure the remediation and cleanup of any proposed development sites that are found to be contaminated with hazardous substances.

### Local Hazard Mitigation Plans

The Disaster Mitigation Act of 200 (Public Law 106-390) requires all state and local governments to develop pre-disaster hazard mitigation planning, post disaster mitigation programs, and periodic updates to plans with public input. The Contra Costa County Hazards Mitigation Plan Update (Tetra Tech, May 2011) provides a blueprint for hazard risk reduction in Contra Costa County for the next five years. The document addresses hazards related to dam failure, drought, earthquake, flood, landslides, severe weather and wildfire. It provides risk ranking and mitigation strategies. The plan was released for public comment in May 2011 but has not yet been adopted. The 2007 Alameda County Local Hazard Mitigation Plan, the Association of Bay Area Governments Multi-Jurisdictional Local Hazard Mitigation Plan, and 2010 Draft Alameda County Annex addresses the same required components. These planning documents do not include specific emergency response or evacuation routes.

## EBMUD Standard Construction Specifications

EBMUD construction specifications set forth the contract requirements for environmental compliance to which construction contractors must adhere. Construction specifications applicable to hazards and hazardous materials include the following: Master Specifications, Environmental Requirements, – Section 01 35 44 (EBMUD, 2011a) and Project Safety Requirements – Section 01 35 24 (EBMUD, 2011b). The Master Specifications stipulate that the construction contractor shall be responsible for maintaining compliance with applicable federal, state, and local requirements. The requirements include preparation of plans that outline procedures to be followed to ensure the safe and lawful handling of hazardous materials, implementation of plans, and documentation of compliance. EBMUD reviews submittals for conformance with the requirements of the contract documents and specified laws and regulations. Specific planning documents and procedures related to hazards and hazardous materials that are required for construction include the following:

- ***SWPPP.*** Plan shall outline procedures for complying with the requirements SWRCB General Construction Stormwater Permit, including measures that shall be implemented to prevent the discharge of contaminated storm water runoff from the construction site.
- ***Water Control and Disposal Plan.*** Plan shall describe measures for containment, handling, and disposal of groundwater (if encountered), runoff water used for dust control, wash water, test water and construction water or other liquid that has come into contact with any interior surface of a pipeline in compliance with regulations of the RWQCB, CDFW, county flood control districts, and any other regulatory agency having jurisdiction, whichever is most stringent. Plan measures shall require characterization of liquids by an accredited analytical laboratory, and submittal to EBMUD of laboratory reports, profile forms, and documentation of waste acceptance by a wastewater treatment plant or disposal facility.
- ***Construction and Demolition Waste Disposal Plan.*** Plan shall identify how the contractor will remove, handle, transport, and dispose of all materials in a safe, appropriate, and lawful manner. The plan shall include the sampling and analytical program for characterization of any waste material, as needed, prior to reuse, recycling or disposal. The plan must identify the disposal method for soil and the approved disposal site, and include

written documentation that the disposal site will accept the waste. Materials and wastes may only be recycled, reused, reclaimed, or disposed of at locations approved by EBMUD. Prior to disposition of wastes, the contractor must submit copies of waste profile forms and correspondence between the contractor and the disposal facility to EBMUD. Prior to disposal of hazardous wastes, the contractor must submit copies of the waste manifests to EBMUD and provide documentation that the waste hauler is regulated by the state to transport hazardous wastes.

- ***Spill Prevention and Response Plan.*** Plan shall detail the methods for preventing accidental releases of hazardous substances, including petroleum products, used during construction and to provide immediate response to spills.
- ***Dust Control and Monitoring Plan.*** Plan shall detail the methods for controlling and monitoring dust generated by demolition and other work.
- ***Project Safety and Health Plan.*** Plan shall address anticipated hazards including hazardous substances, confined spaces, fall protection, trenches or excavations in accordance with Cal/OSHA regulations. It must designate a Project Health and Safety Representative and a qualified person to conduct sampling of air and suspect hazardous substances. The contractor is responsible for sampling for airborne contaminants and testing of materials suspected of containing hazardous substances to determine if such materials pose potential safety and health exposure hazards. Results from an OSHA-certified laboratory must be submitted to EBMUD along with a map showing the location and date of materials sampled. All personnel who will likely be exposed to hazardous substances must have appropriate training. The plan shall include an emergency action plan in the event of an accident that requires notifying any responsive agencies.
- ***Electrical Safety Plan.*** Plan shall detail worker protection from hazardous voltages on pipelines and appurtenances as a result of electromagnetic induction from nearby electrical transmission lines, including temporary pipeline grounding and bonding.
- ***Fire Prevention and Protection.*** Contractor must maintain on the project site adequate fire-fighting equipment capable of extinguishing incipient fires and comply with all applicable fire prevention regulations or National Fire Prevention Standards for Safeguarding Building Construction Operations (NFPA No. 241).
- ***Excavation Safety.*** Contractor must submit utility marking tracking number (USA North) and verification of markings to EBMUD and comply with procedures in CCR 4216 for excavation notifications and utility excavation.

## 3.9.3 Impacts and Mitigation Measures

### Significance Criteria

For the purposes of this EIR and consistent with Appendix G of the CEQA Guidelines, the West of Hills Northern Pipelines Project is considered to have a significant impact if it would:

- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school;
- Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment;
- For a project located within an area covered by an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area;
- For a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area; or
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
- Expose people or structures to a significant risk of loss, injury, or death involving wildfires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands;

## Approach to Analysis

This analysis focuses on the potential to encounter hazardous substances in soil and groundwater during construction and is based on the regulatory database searches discussed in Section 3.9.1. The analysis also addresses the potential for the Project to release hazardous materials during construction and operation, interfere with an adopted emergency response plan or emergency evacuation plan, and create fire hazards. Each potential impact is assessed in terms of the applicable regulatory requirements, and mitigation measures are identified as appropriate.

Due to the nature of the proposed pipelines Project, there would be no impacts related to the following criteria; therefore, no impact discussion is provided for these topics for the reasons described below.

- ***Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.*** The project site is not located on a designated hazardous materials site and, therefore, would not create a significant hazard to the public or the environment. Potential hazards resulting from project construction near known hazardous materials sites in the project vicinity are discussed under Impact 3.9-1.
- ***Safety Hazards in the Vicinity of an Airport.*** The nearest airport to the Project, the Oakland International Airport, is approximately ten miles south of the project site. Because the project site is more than two miles from an airport, and because implementation of the proposed Project would not involve the construction of structures that could interfere with air traffic, the criterion related to safety hazards in the vicinity of an airport is not applicable to the Project.

- ***Safety Hazards in the Vicinity of a Private Airstrip***. Similarly, there are no private airstrips within two miles of the project site; therefore, this criterion is not applicable to the Project.
- ***Interference with an Adopted Emergency Response Plan or Emergency Evacuation Plan.*** Contra Costa County and Alameda County do not have adopted emergency response or evacuation plans that designate specific emergency response or evacuation routes within the project site vicinity; therefore, this criterion is not applicable to the Project. Although construction activities could impede access for emergency response vehicles, measures to avoid interference with emergency access are addressed in Section 3.13, Transportation and Traffic.

## Impacts and Mitigation Measures

**Impact 3.9-1: The proposed Project could result in significant hazards from the release of hazardous materials present in soil or groundwater at documented hazardous materials sites within the project vicinity (applies to all pipelines).**

### *Construction*

As discussed in Section 3.9.1 above, the project site is located within ¼-mile of numerous hazardous materials sites. Documented releases of hazardous materials have affected soil and/or groundwater conditions in the project vicinity, most commonly as a result of LUSTs. Typical contaminants in soil and groundwater from LUST sites include petroleum hydrocarbons such as gasoline, diesel, motor oil, waste oil, volatile organic compounds (VOCs), and metals. Residual soil and groundwater contamination may remain in place even after cases are closed by regulatory agencies. Based on the large number of hazardous materials sites in close proximity to the proposed pipeline alignments, it is likely that contamination from some of these sites has migrated in groundwater and affected soil and groundwater conditions along the proposed pipeline alignments.

As a result, the potential exists for workers to encounter hazardous materials in soil and groundwater during excavation, potentially exposing construction workers and the public to these materials or their chemical vapors or otherwise releasing them into the environment. Depending on the nature and extent of any contamination encountered, adverse health effects could result if proper precautions were not taken. However, compliance with EBMUD's Master Specifications, Environmental Requirements - Section 01 35 44 (EBMUD, 2011a) and Project Safety Requirements – Section 01-35-24 would reduce this impact to a *less-than-significant* level by requiring, -sampling and laboratory analysis of soil and groundwater at project locations anticipated to have a high likelihood of contamination. Locations of potential contamination would be determined by EBMUD through a hazardous material database search during the design phase. Contamination at these locations are confirmed either by reviewing the results of soil testing for other EBMUD work in the area or by potholing and soil testing in the area. The contractor would use the site-specific chemical sampling data to identify the appropriate personal protective equipment and safety measures within the Health and Safety Plan required under EBMUD standard contract specifications. Implementation of the site-specific Health and Safety Plan in accordance with OSHA regulations (CFR 1910.120) would reduce the potential for harmful exposure of construction workers and the public to contaminated soil and groundwater encountered during project construction. In addition, this sampling data would be used to prepare the Water Control and Disposal Plan and the Construction and Demolition Waste Disposal Plan, which are also required under EBMUD standard contract specifications. These plans would ensure that contaminated soil and groundwater are handled in a safe and lawful manner.

### *Operation and Maintenance*

Project operation and maintenance activities include flushing, hydrant testing, anode replacement, leak detection and repair, and ROW maintenance. Activities such as anode replacement and leak repair would involve disturbance of subsurface materials and could result in exposure to and/or release of hazardous materials in soil or groundwater. The EBMUD Environmental Compliance Manual (EBMUD, 2010) outlines the procedures to be followed for trench spoil management and water quality protection during routine and non-routine operations and maintenance activities. These procedures require trench spoils site investigations in advance of construction activities to determine if health and safety precautions are required and to determine disposal methods for both trench spoils and/or groundwater. The first step in the trench spoils investigation is an environmental database review, which will determine if potential contamination may pose a health and safety risk, in which case, site sampling is required. The results of the laboratory analysis of samples are reviewed by EBMUD staff to determine appropriate health and safety levels and disposal requirements. With implementation of the procedures outlined in the EBMUD Environmental Compliance Manual and compliance with applicable laws and regulations, the impact related to a reasonably foreseeable release and exposure to hazardous materials in soil and groundwater during project operations and maintenance would cause a *less-than-significant* hazard to the public or the environment.

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**Impact 3.9-2: The proposed Project would not result in significant hazards to the public or the environment through the routine transport, use, or disposal of hazardous materials (applies to all pipelines).**

### *Construction*

Fuels, lubricants, paints, and solvents would be used during construction activities. Storage and use of hazardous materials at the construction sites and staging areas could result in the accidental release of small quantities of hazardous materials, which could result in exposures to construction workers and/or degrade site soil, groundwater, or nearby surface water bodies, such as San Pablo Creek and Wildcat Creek. However, as described above in Section 3.9.2 and in Section 3.10, Hydrology and Water Quality, compliance with Section 01 35 44 of the EBMUD construction specifications, would require preparation of a SWPPP and a Spill Prevention and Response Plan. Implementation of construction BMPs outlined in these plans would reduce the risk of a hazardous materials release during construction activities. The BMPs would include protection measures for the temporary onsite storage of fuel and other hazardous materials used during construction, including requirements for secondary containment and berming to prevent any such release from reaching an adjacent waterway or stormwater collection system. All equipment and materials storage would need to be routinely inspected for leaks, and records maintained for documenting compliance with the storage and handling of hazardous materials. Spill response measures would address notification of EBMUD, safety issues regarding construction personnel and public health, and methods for spill response and cleanup. With compliance with EBMUD contract specifications, hazardous materials impacts associated with potential chemical spills or releases of petroleum products during construction would be *less than significant*.

### *Operation and Maintenance*

Project operation and maintenance would not require the transportation, use, storage or disposal of hazardous materials, however, trucks and equipment utilized for these routine operations would use fuels and other hazardous materials, and it is possible that accidental releases could occur. Based on the nature of the operations and maintenance activities, it is anticipated that potential leaks and spills from vehicles and equipment would be relatively minor and addressed by spill cleanup procedures required by EBMUD's Environmental Compliance Manual. Therefore, the potential for significant hazard to the public or the environment would be *less than significant*.

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**Impact 3.9-3: The proposed Project could result in potential adverse effects related to the rupture of subsurface utilities (applies to all pipelines).**

### *Construction*

During trench and pit excavation, the potential exists for subsurface utilities (e.g., a high-pressure natural gas line or electrical line) to be inadvertently damaged. The rupture of a high-pressure gas pipeline could result in a release of flammable liquids or gases. If these flammable materials came into contact with an open flame or spark, the potential consequences include jet flame, vapor cloud flash fire, and explosion. Contact with buried or overhead electrical utilities could cause electrocution or shock. Such damage to utilities could fatally injure construction workers, damage equipment, and initiate fires. Because of the greater risk involved in excavating around high-pressure gas lines and the potential for catastrophic results, this impact is considered a *significant* hazard to the public unless adequate mitigation measures are implemented.

As described above under State Regulations, the construction contractor is required by State law to conform to applicable Cal OSHA Construction Safety orders, including a requirement to contact USA North at least two working days prior to initiation of ground-disturbing construction activities. USA North would notify the utility providers in the vicinity of the planned excavations. Each provider would be responsible for marking the location of its underground utilities and coordinating with the contractor to avoid damage.

Although this requirement would provide notification to utility owners of planned excavation activities, given the length of the proposed pipeline alignments, it may not provide sufficient time for utility owners to locate and mark the subsurface utilities or for EBMUD and its contractors to develop and incorporate appropriate design changes, if needed, to avoid damage to the utility, which could result in a *potentially significant* impact.

Implementation of Mitigation Measure HAZ-2a through HAZ-2c would reduce this impact to a *less-than-significant* level by requiring advance coordination with utility providers for protection of the subsurface utilities, protection for utilities during construction, and notification to local fire departments and utility providers regarding any damage to utilities. Mitigation Measure HAZ-2a requires adherence to EBMUD Engineering Standard Practice (ESP) 514, Identifying Buried Conflicts (EBMUD, 2008) during project design and construction. ESP-514 outlines the minimum steps required to identify existing utilities, which include the following: requesting as-built documents, drawings, and maps from all utilities within the project area; conducting a site visit; contacting city, county and utility owners in writing to inform them of the Project; locating utilities by subsurface geophysical methods, potholing, test holes, or other excavation methods as determined by the site conditions and determining factors set forth in the guidelines. Construction guidelines would include review of pothole data and design and tailgate safety meetings prior to the start of excavation each day to discuss potential utility conflicts. Mitigation Measure HAZ-2b would require the protection of underground utilities during construction, and Mitigation Measure HAZ-2c requires notification to fire departments and/or utility owners of potential damage. With implementation of these measures, the potential for pipeline or electrical line rupture would be low, and impacts related to the damage of high-pressure gas lines and electrical lines would be *less than significant*.

### *Operation and Maintenance*

Project operations and maintenance activities such as anode replacement and leak repair require drilling or excavation activities that have the potential to damage subsurface utilities, a *significant impact*. As described above for project construction, implementation of Mitigation Measure HAZ-2a through HAZ-2c would reduce this impact to a *less-than-significant* level.

**Mitigation Measure HAZ-1a: Identifying Buried Utilities.**

EBMUD and/or its construction contractor(s) will adhere to EBMUD Engineering Standard Practice 514, Identifying Buried Conflicts (EBMUD, 2008) which sets forth the requirements and guidelines for planning, design and construction to identify existing buried utilities/conflicts.

**Mitigation Measure HAZ-1b: Subsurface Utility Protection.**

While any excavation is open, EBMUD or its contractors will protect, support, or remove underground utilities as necessary to safeguard employees.

**Mitigation Measure HAZ-1c: Notification of Utility Damage.**

EBMUD or its contractors will notify local fire departments whenever damage to a gas utility results in a leak or suspected leak, or whenever damage to any utility results in a threat to public safety. EBMUD or its contractors will also contact utility owners if any damage occurs as a result of the Project and coordinate repair with approval of the owner.

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**Impact 3.9-4: The proposed Project could expose construction workers and the public to naturally occurring asbestos (applies to all pipelines).**

### Construction

As discussed in Section 3.9.1, potentially ultramafic rock has been mapped in close proximity to the Wildcat Pipeline (Berkeley) and the Central Pressure Zone Pipeline (El Cerrito/Richmond). Sedimentary deposits in these areas may contain naturally occurring asbestos. Excavation or grading in soil containing naturally occurring asbestos could produce airborne (or "fugitive") dust that could affect onsite workers and the surrounding population unless appropriate control measures are implemented. Exposure to workers and the public from fugitive asbestos-containing dust due to construction activities would be a potentially significant impact. This impact would be reduced to a *less-than-significant* level with implementation of Mitigation Measure HAZ-3 (Asbestos Dust Mitigation Plan), which would require the contractor to prepare an asbestos dust mitigation plan for BAAQMD for areas where naturally occurring asbestos is found and to implement dust control measures throughout construction that would minimize the potential for fugitive dust from construction sites to affect site workers and the surrounding population.

### Operation and Maintenance

Project operation and maintenance activities such as anode replacement and leak repair would require drilling or excavation activities that could result in exposure to naturally occurring asbestos. Due to the limited nature of these activities, the affected area of potential asbestos-containing material would be far less than one acre. According to BAAQMD regulations, for sites of this size, standard best management practices would be sufficient to reduce the potential for fugitive dust to affect construction workers or the surrounding population. Therefore, for operations and maintenance activities, this impact would be *less than significant.*

**Mitigation Measure HAZ-2: Asbestos Dust Mitigation Plan.**

For the Wildcat Pipeline (Berkeley) and Central Pressure Zone Pipeline (El Cerrito/ Richmond), EBMUD or its contractor will conduct soil testing within areas of the pipeline alignments that are located within 100 feet of mapped ultramafic rock. This may be completed in conjunction with potholing conducted during the design phase. If ultramafic rock is found within the pipeline alignment, EBMUD or its contractor will submit notification of proposed construction activities to the BAAQMD and prepare an Asbestos Dust Mitigation Plan to be implemented in areas containing ultramafic rock. Additional measures, including air quality monitoring for fugitive asbestos dust, may be required by the BAAQMD. The contractor will implement all specified dust control measures and keep records of daily inspections and activities that document implementation of the plan. The plan will comply with BAAQMD criteria and address the following as applicable:

- Prevent and control visible track-out from the project site.
- Ensure adequate wetting or covering of active storage piles and disturbed surface areas.
- Control earthmoving activities by pre-wetting ground or suspending activities during windy periods.

- Ensuring that trucks hauling excavated materials are adequately wet and covered.
- Stabilize disturbed areas following construction by paving or establishing vegetative cover.

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**Impact 3.9-5: The proposed Project would not release hazardous emissions or handle acutely hazardous materials, substances or waste within ¼ mile of a school (applies to all pipelines).**

### *Construction*

Hazardous air emissions are toxic air contaminants identified by the CARB and the BAAQMD. Project construction would occur within 1/4 mile of a number of schools and construction activities would result in the emission of diesel particulate matter (DPM), a toxic air contaminant. However, based on a conservative screening-level analysis (as discussed in Section 3.3, Air Quality), construction emissions of DPM would be less than the BAAQMD threshold of 10 in a million and would be considered a *less-than-significant* impact.

Extremely hazardous materials are defined by the State of California in Section 25532 (2)(g) of the Health and Safety Code. During project construction, only common hazardous materials such as paints, solvents, cements, adhesives, and petroleum products (such as asphalt, lubricants, degreasers, and fuel) would be used, none of which are considered extremely hazardous materials. During construction, hazardous materials could be used or stored near a school. Although construction activities could result in the inadvertent release of small quantities of these materials, a spill or release at a construction site would not result in an emission with the potential to result in exposures to individuals at nearby schools due to the types and quantities of hazardous materials that would be utilized. Standard construction BMPs required by the SWPPP and Spill Prevention and Control Plan include measures for the safe handling and storage of hazardous materials used during construction to prevent a release and methods to contain any such release if it should occur. Because the potential for a release resulting from the use or handling of hazardous materials to affect individuals at nearby schools would be low, the potential impact related to the use of hazardous materials at these sites would be *less than significant*.

### *Operation and Maintenance*

Project operation and maintenance would not use hazardous materials in quantities that could result in hazardous releases or emissions, therefore, there would be *no impact* related to harmful exposures to individuals at nearby schools.

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**Impact 3.9-6: Exposure of people or structures to a significant risk of property loss, injury, or death involving wildfires (applies to all pipelines).**

### *Construction*

The use of construction equipment and temporary onsite storage of diesel fuel could pose a wildland fire risk in areas classified by CAL FIRE as a "Very High Fire Hazard Severity Zone" or in areas identified as an Urban-Wildland Interface; however, the project site is not located within a designated high fire hazard area. The use of construction equipment and the temporary onsite storage of diesel fuel and other flammable hazardous materials could pose an increased fire risk potentially resulting in risk of property loss or injury. In accordance with EBMUD Contract Specification Section 01 35 24, fire-fighting equipment capable of extinguishing incipient fires would be maintained on the project site, contractors would be required to comply with hazardous materials storage and fire protection regulations as well as applicable National Fire Prevention Standards for construction operations. Together, these requirements would ensure that the risk of hazards related to fires during construction would be *less than significant*.

### *Operation and Maintenance*

Operations and maintenance activities include flushing, hydrant testing, anode replacement, leak detection, leak repair, and ROW maintenance. These activities would involve the limited use of fuel for trucks and other equipment that could slightly increase potential fire risks. As described above for construction, compliance with hazardous materials storage and fire protection regulations would ensure that the risk of hazards related to fire during project operation would be *less than significant*.

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# 3.10 Hydrology and Water Quality

This section evaluates the potential impacts on hydrology and water quality that could result from implementation of the proposed West of Hills Northern Pipelines Project. Because the four proposed pipeline segments would be constructed almost entirely below ground and would not affect site drainage or flooding, and use of the pipelines would not involve discharges or change drainage patterns or stream flow, this report focuses on construction-related water quality and hydrology impacts.

## 3.10.1 Setting

### Surface Water Features and Watersheds

The proposed pipeline segments traverse several watersheds in Alameda and Contra Costa Counties that drain to Central San Francisco Bay and San Pablo Bay (**Figure 3.10-1**). Most of the creeks in these watersheds were lined or culverted during the first half of the 20th century to accommodate urbanization and flooding in the lower watersheds which are now drained by extensive municipal stormwater systems.

#### *Alameda County*

The Wildcat Pipeline (Berkeley) would be located within the Potter/Derby Creeks Watershed and the Temescal Creek Watershed. These watersheds drain to Central San Francisco Bay.

##### Potter/Derby Creeks Watershed

There are no named tributaries in the Potter/Derby Creeks Watershed, which drains an area of 3.9 square miles (Sowers and Richards, 2010). Except for a small stretch on the Clark Kerr Campus of the University of California, Berkeley, the stream channel of both creeks has been completely filled in and the creeks are replaced by one storm drain network (Oakland Museum of California, 2012). During wet winters, springs have been observed in the basements of buildings such as the Julia Morgan Theater at 2640 College Avenue in Berkeley. When this occurs, the water can overflow from the basements and the curb. The proposed Wildcat Pipeline (Berkeley) alignment crosses four underground drainages in this watershed.

##### Temescal Creek Watershed

The Temescal Creek Watershed drains an area of 6.7 square miles and includes Temescal Creek and its tributaries Harwood Creek and Vicente Creek (Sowers and Richards, 2010). Although much of Harwood Creek is contained within its natural bed in the Berkeley Hills including a short segment parallel to The Uplands, it is culverted where it is crossed by the proposed Wildcat Pipeline (Berkeley) alignment.

#### *Contra Costa County*

Both the proposed Wildcat Pipeline (El Cerrito) and Central Pressure Zone Pipeline (El Cerrito/Richmond) alignments traverse the Cerrito Creek, Hoffman Channel, and Baxter


SOURCE: Sowers, 2007; Sowers and Richards, 2010

EBMUD West of Hills Northern Pipelines . 211488

**Figure 3.10-1**
Creek and Watershed Map

Creek watersheds, and the Central Pressure Zone Pipeline (Richmond/San Pablo) alignment traverses the Harbor Channel, Wildcat Creek, and San Pablo Creek watersheds in Contra Costa County (Sowers, 2007; CCCCDD, 2003). The Contra Costa County watersheds drain to both Central San Francisco Bay and San Pablo Bay.

#### Cerrito Creek Watershed

The Cerrito Creek Watershed drains a 3.1-square-mile area (Sowers, 2007). Cerrito Creek (5.82 miles) originates in the East Bay Hills to the east and straddles the Contra Costa–Alameda County border, draining the hills of El Cerrito and Kensington before draining to the Albany Flats and San Francisco Bay, just south of Point Isabel Regional Shoreline (Contra Costa County Community Development Department [CCCCDD], 2003). In this watershed, the proposed alignment of Wildcat Pipeline (El Cerrito) crosses the North Fork of Cerrito Creek. The proposed Central Pressure Zone Pipeline (El Cerrito/Richmond) alignment crosses an unnamed underground drainage channel. All creeks are underground where they are crossed by the proposed pipeline alignments. The average annual rainfall in this watershed is 22 inches. Cerrito Creek drains to Central San Francisco Bay.

#### Hoffman Channel Watershed

This small watershed, located between the Cerrito Creek and Baxter Creek watersheds, drains an area of 1.2 square miles (Sowers, 2007). It drains to the Central San Francisco Bay through Hoffman Channel. In the flat areas of western El Cerrito, all of the natural water features have been redirected underground, including where they are crossed by the proposed Wildcat Pipeline (El Cerrito) and Central Pressure Zone Pipeline (El Cerrito/Richmond) alignments.

#### Baxter Creek Watershed

The Baxter Creek Watershed drains a 2.9-square-mile area (Sowers, 2007). Originating in underground springs in the East Bay Hills to the east, beneath El Cerrito's Mira Vista Golf Course (CCCCDD, 2003), Baxter Creek and its tributaries flow down in three branches. After running through a series of neighborhood parks, the creeks join near San Pablo Avenue and MacDonald Avenue. Baxter Creek then flows through Richmond into Stege Marsh and San Francisco Bay. The proposed Wildcat Pipeline (El Cerrito) alignment crosses Wildwood Creek and two other tributaries to Baxter Creek, and the proposed Central Pressure Zone Pipeline (El Cerrito/Richmond) alignment crosses Wildwood Creek and three other tributaries to Baxter Creek, and also crosses Baxter Creek to the north. All creeks are underground where they cross the proposed pipeline alignments. This watershed drains to Central San Francisco Bay.

#### Harbor Channel Watershed

The Harbor Channel Watershed drains an area of 2.9 square miles (Sowers, 2007). There are no natural creeks in this watershed, and all of the drainage features are underground storm drains or engineered channels, except for a few open portions to the east of the project area. The proposed Central Pressure Zone Pipeline (Richmond/San Pablo) alignment crosses one underground channel in this watershed. This watershed drains to Central San Francisco Bay.

#### Wildcat Creek Watershed

The Wildcat Creek Watershed drains a 10.7-square-mile area (CCCCDD, 2003). The upper watershed is contained in Wildcat Canyon and Tilden Regional Parks. The lower watershed enters the alluvial plain at Alvarado Park in Richmond. Wildcat Creek flows parallel to the Hayward fault from Wildcat Canyon, then through the cities of San Pablo and Richmond to the San Francisco Bay. The estimated 100-year flood flow in this creek is 2,280 cubic feet per second. Approximately 90 percent of Wildcat Creek flows within its natural bed, but the creek is contained within a culvert beneath 23rd Street where the proposed Central Pressure Zone Pipeline (Richmond/San Pablo) alignment crosses the creek. Wildcat Creek drains to San Pablo Bay.

#### San Pablo Creek Watershed

Draining a 43-square-mile area, the San Pablo Creek Watershed is the largest watershed in the Richmond area (CCCCDD, 2003). With its headwaters in the city of Orinda, the creek flows across EBMUD lands and into San Pablo Reservoir. Tributary headwaters to the north enter the Briones Reservoir and are regulated by EBMUD as well. From San Pablo Reservoir, the creek flows approximately 8 miles through rural, and then heavily urbanized residential and commercial areas before reaching the saltwater marshes adjacent to San Pablo Bay. Nearly 90 percent of San Pablo Creek flows within its natural bed, including where the proposed Central Pressure Zone Pipeline (Richmond/San Pablo) alignment crosses the creek in either the preferred alignment and the San Pablo Avenue option.

## Water Quality

The Clean Water Act (discussed below in Regulatory Setting) requires state governments to identify a list of impaired water bodies, defined as those water bodies that do not meet water quality standards. San Pablo and Wildcat Creeks are listed as impaired water bodies owing to the presence of diazinon, a pesticide that originates from urban run-off and storm sewers (SWRCB, 2010). San Pablo, Baxter, and Cerrito Creeks are also listed as impaired water bodies as a result of trash.

Central San Francisco Bay and San Pablo Bay are identified as impaired water bodies for chlordane, dichlorodiphenyltrichloroethane (DDT), dieldrin, dioxin compounds, furan compounds, invasive species, mercury, polychlorinated biphenyls (PCBs), dioxin-like PCBs, and selenium. Central San Francisco Bay is also listed for trash.

## Flood Hazards

### *Flooding*

Flooding in the San Francisco Bay region is primarily restricted to areas along the San Francisco Bay margins and along individual streams. An extensive network of flood control channels has been constructed throughout the region, and flood control improvements have been made to many of the streams to contain the 100-year and 500-year floods. Where the proposed pipeline alignments cross creeks or channels, the 100-year peak flows are contained within existing creek channels and culverts except where the Wildcat Pipeline (Berkeley) crosses Harwood Creek and where the Central Pressure Zone Pipeline (Richmond/San Pablo) crosses Wildcat and San Pablo Creeks.

In the city of Berkeley, extensive reaches of most creeks are completely contained by culverts, and many bridges and culverts segment the open creek reaches (FEMA, 2009d). Localized flooding occurs primarily as a result of blocked culverts and reaches. When creek flows exceed the creek channel capacity, the excess flows will inundate adjacent streets where considerable flow attenuation takes place. As shown on **Figure 3.10-2**, the Wildcat Pipeline (Berkeley) crosses a flood zone of Harwood Creek in Berkeley (FEMA, 2009c). The Federal Emergency Management Agency (FEMA) classifies this as Zone X (Other Flood Area), defined as an area where the 500-year flood occurs or where the 100-year flood would result in shallow flooding of 1 foot or less.

The Central Pressure Zone Pipeline (Richmond/San Pablo) crosses the 100-year flood zone identified by FEMA on both Wildcat and San Pablo Creeks in the city of San Pablo. Near the crossing, the base flood elevation is 51 feet North American Vertical Datum of 1988 (NAVD88) on Wildcat Creek (FEMA, 2009a). The base flood elevation on San Pablo Creek is 46 feet NAVD88 where it crosses the EBMUD right of way and 49 feet NAVD88 where it crosses San Pablo Avenue. In this area, flood flows are held back by culverts under the Union Pacific and Burlington Northern Santa Fe Railroads, approximately 0.5 mile to the west of the crossing (FEMA, 2009b), resulting in broad areas of shallow flooding between the creeks that also extends on either side of the creeks. Near the point the creeks are crossed by the proposed Central Pressure Zone Pipeline (Richmond/San Pablo) alignment, the peak discharge of San Pablo Creek during a 100-year flood is less than 5,100 cubic feet per second, and the peak discharge in Wildcat Creek is less than 2,300 cubic feet per second (FEMA, 2009b). To help alleviate flooding effects, the City of San Pablo implements a channel maintenance program, which includes cleaning of the creek channel and repairing erosion control devices to keep debris from accumulating at the railroad culverts.

### *Dam Failure*

The proposed pipeline alignments cross the inundation zone of several EBMUD reservoirs. In San Pablo, the northern end of the Central Pressure Zone Pipeline (Richmond/San Pablo) lies within the inundation zone of San Pablo Dam, and the northernmost tip of this alignment to the north of San Pablo Creek lies within the inundation zone for North Reservoir (EBMUD, 1975b, 1975d). The southern terminus of the Wildcat Pipeline (El Cerrito) alignment lies within the inundation zone of the San Pablo Clearwell (EBMUD, 1975a) and part of the southern section of the Wildcat Pipeline (Berkeley) alignment traverses the inundation zone for the Claremont Reservoir (EBMUD, 1975c).

### *Seiche or Tsunami*

Tsunamis (seismic sea waves) are long-period waves that are typically caused by underwater seismic disturbances, volcanic eruptions, or submerged landslides. Tsunamis, which travel at speeds up to 700 miles per hour, are typically only 1 to 3 feet high in open ocean water but may increase in height up to 90 feet as they reach coastal areas, potentially causing large amounts of damage when they reach land (URS, 2008). Low-lying coastal areas, such as tidal flats, marshlands, and former bay margins that have been artificially filled but are still at or near sea level, are generally the most susceptible to tsunami inundation. A seiche is caused by oscillation

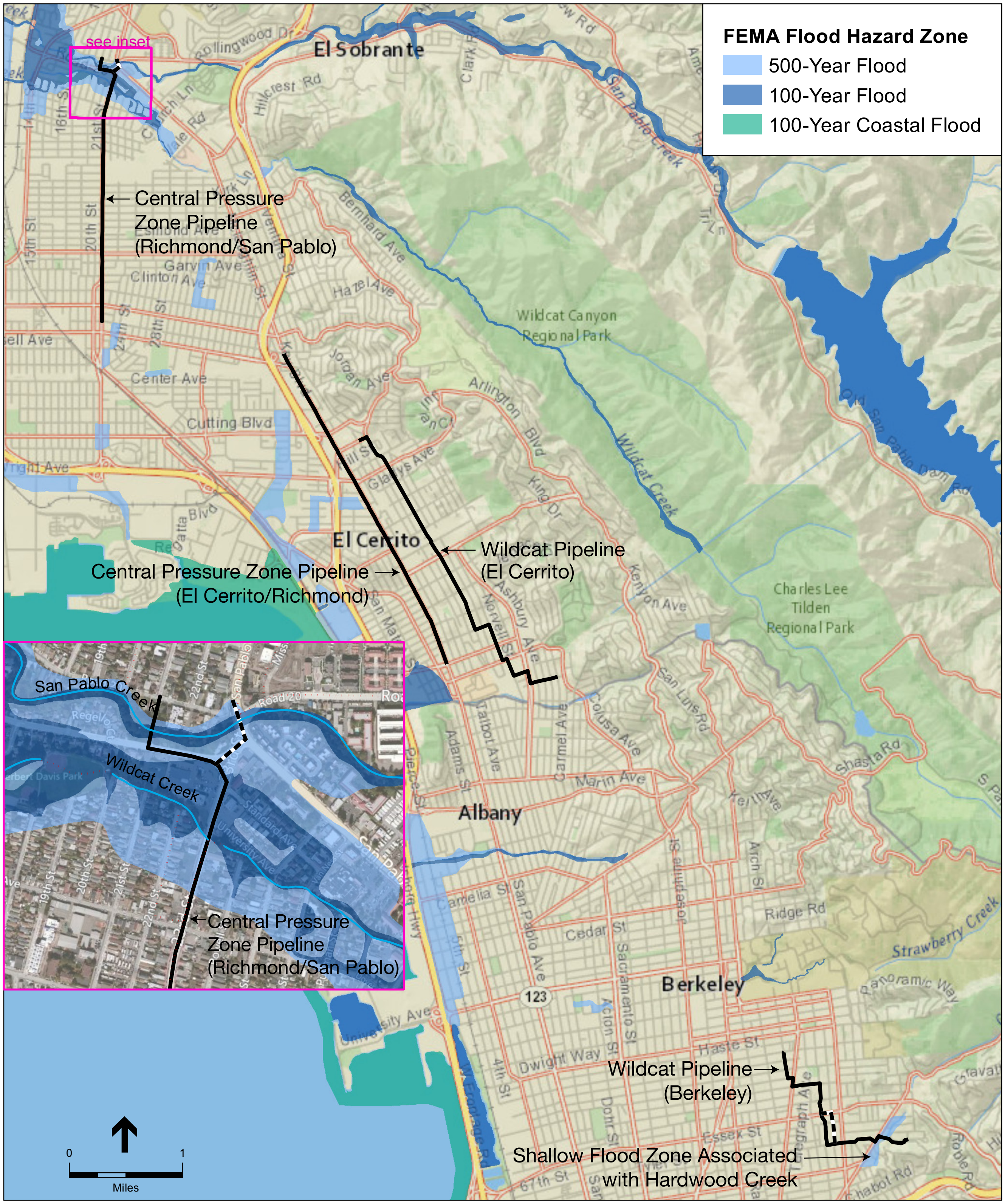






**Figure 3.10-2**
FEMA Flood Hazard Zones

of the surface of an enclosed body of water, such as San Francisco Bay, as a result of an earthquake or large wind event. Seiches can result in long-period waves that cause run-up or overtopping of adjacent landmasses, similar to tsunami run-up.

In 2009, the California Geological Survey (CGS), California Emergency Management Agency (CalEMA), and the Tsunami Research Center at the University of Southern California (USC) completed the state's official tsunami inundation maps. Based on this mapping, the project area is not located in an area identified for potential inundation in the event of a tsunami or seiche (CalEMA, CGS, and USC, 2009a, 2009b).

### Groundwater Occurrence

The project area is located within the East Bay Plain Groundwater Basin, which is regionally subdivided into two major basins, the San Pablo Basin and the San Francisco Basin. These latter basins are further divided into seven sub-areas (RWQCB, 1999). The proposed pipeline segments are located within the Berkeley sub-area of the San Francisco Basin and the Richmond sub-area of the San Pablo Basin. Within these sub-areas, the base of the East Bay Plain is defined as the contact between the unconsolidated sediments and the underlying bedrock. The Richmond sub-area is estimated to contain at least 600 feet of unconsolidated sediments that compose the water-bearing units. In this sub-area, the clay layers separating the shallow and deep water-bearing layers are of limited extent, and thus the water-bearing layers are considered interconnected. The thickness of unconsolidated sediments in the Berkeley sub-area ranges from 10 to 300 feet, averaging 100 to 200 feet. There are no reported clay layers that function as major aquitards.[1] Shallow groundwater commonly occurs above the major water bearing units comprising the East Bay Plain Groundwater Basin and this shallow groundwater is frequently semi-confined, particularly in West Berkeley.

## 3.10.2 Regulatory Setting

### Federal Regulations

#### *Clean Water Act*

The federal Clean Water Act (1972) and subsequent amendments, under the enforcement authority of the U.S. Environmental Protection Agency (USEPA), were enacted "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The Clean Water Act gave the USEPA the authority to implement pollution control programs, such as setting wastewater standards for industry. It also set water quality standards for surface waters and established the National Pollutant Discharge Elimination System (NPDES) program to protect water quality.

[1] An aquitard is a fine-grained unit (such as clay or silt) that restricts the vertical movement of groundwater. Where groundwater occurs beneath an aquitard, the aquifer is considered confined.

### Section 303(d) List of Impaired Water Bodies and TMDLs

In accordance with Section 303(d) of the Clean Water Act, states must present the USEPA with a list of "impaired water bodies," defined as those water bodies that do not meet water quality standards. The Clean Water Act requires the development of total maximum daily loads (TMDLs) or other actions to improve water quality of impaired water bodies. Implementation of this program in the project area is conducted by the San Francisco Bay RWQCB and is discussed under State Regulations, below.

### Section 402

Under Section 402 of the Clean Water Act, discharge of pollutants to navigable waters is prohibited unless the discharge is in compliance with an NPDES permit. The USEPA determined that California's water pollution control program has sufficient authority to manage the NPDES program under state law in a manner consistent with the Clean Water Act. Therefore, implementation and enforcement of the NPDES program is conducted through the California State Water Resources Control Board (SWRCB) and the nine RWQCBs. The San Francisco Bay RWQCB has set standard conditions for each permittee in the Bay Area, which includes effluent limitation and monitoring programs. The proposed Project would be subject to NPDES permits described under State Regulations, below.

### Section 404

Under Section 404 of the Clean Water Act, a Department of the Army permit must be obtained from the United States Army Corps of Engineers (USACE) for work within the bed or bank of waters of the United States, including wetlands. USACE reviews applications for permits in accordance with Section 404 guidelines, which have been established by USACE and USEPA, and typically limits and requires mitigation for impacts to waters of the United States before it will issue a permit. This permit would not be required for the proposed Project because the pipe bridge across San Pablo Creek would be constructed above the ordinary high water mark of San Pablo Creek and there would be no work within the bed or bank of waters of the United States, including wetlands, required for construction of any of the proposed pipelines.

### Section 401

Section 401 of the Clean Water Act requires compliance with state water quality standards for actions within state waters. Compliance with the water quality standards required under Section 401 is a condition for issuance of a Section 404 permit. Under Section 401 of the Clean Water Act, every applicant for a federal permit or license for any activity that may result in a discharge to a water body must obtain a State Water Quality Certification that the proposed activity will comply with state water quality standards. A State Water Quality Certification is not required for the proposed Project because a Section 404 permit would not be required as discussed above.

## State Regulations

### *Porter-Cologne Water Quality Control Act*

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides for the protection of the quality of all waters of the State of California for use and enjoyment by the people of California. The act also establishes provisions for a statewide program for the control of water quality, recognizing that waters of the state are increasingly influenced by interbasin water development projects and other statewide considerations, and that factors such as precipitation, topography, population, recreation, agriculture, industry, and economic development vary regionally within the state. The statewide program for water quality control is therefore administered on a local level with statewide oversight. Within this framework, the act authorizes the SWRCB and RWQCBs to oversee the coordination and control of water quality within California.

### *San Francisco Bay Water Quality Control Plan (Basin Plan)*

San Francisco Bay waters are under the jurisdiction of the San Francisco Bay RWQCB, which established regulatory standards and objectives for water quality in the Bay in the *Water Quality Control Plan for the San Francisco Bay Basin*, commonly referred to as the Basin Plan. The Basin Plan identifies existing and potential beneficial uses for surface waters (described below in Beneficial Uses) and provides numerical and narrative water quality objectives designed to protect those uses. The preparation and adoption of water quality control plans is required by the California Water Code (Section 13240) and supported by the federal Clean Water Act.

Because beneficial uses, together with their corresponding water quality objectives, can be defined per federal regulations as water quality standards, the Basin Plan is a regulatory reference for meeting the state and federal requirements for water quality control. Adoption or revision of surface water standards is subject to the approval of the USEPA. The Basin Plan water quality objectives require that the pH of a receiving water is not depressed below 6.5 nor raised above 8.5. In addition, controllable water quality factors shall not cause changes greater than 0.5 units in normal ambient pH levels.

#### Beneficial Uses

Beneficial uses serve as a basis for establishing water quality objectives and discharge prohibitions to achieve the water quality necessary to provide the maximum benefit to the people of the state. Beneficial uses are designated in Basin Plans for surface waters and groundwater basins, and, in the case of the San Francisco Bay Basin, for wetlands. **Table 3.10-1** presents existing beneficial uses for each water body within the project area, as well as Central San Francisco Bay and San Pablo Bay. Note that while none of the proposed pipeline alignments would cross Temescal Creek, the Wildcat Pipeline (Berkeley) would cross Harwood Creek, a tributary to Temescal Creek. The RWQCB has not designated beneficial uses for Harwood Creek. However, the beneficial uses identified for Temescal Creek also apply to Harwood Creek because it is a tributary.

**TABLE 3.10-1**
**DESIGNATED BENEFICIAL USES**

| Water Body | Designated Beneficial Uses |
|---|---|
| Temescal Creek | COLD, WARM, WILD, REC-1, REC-2 |
| Cerrito Creek | WARM, WILD, REC-1, REC-2 |
| Baxter Creek | WARM, WILD, REC-1, REC-2 |
| San Francisco Bay, Central | IND, PROC, COMM, SHELL, EST, MIGR, RARE, SPWN, WILD, REC-1, REC-2, NAV |
| Wildcat Creek | FRSH, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2 |
| San Pablo Creek | FRSH, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2 |
| San Pablo Bay | IND, COMM, SHELL, EST, MIGR, RARE, SPWN, WILD, REC-1, REC-2, NAV |

Beneficial Uses Key:

COLD (Cold Freshwater Habitat)
EST (Estuarine Habitat)
IND (Industrial Service Supply)
NAV (Navigation)
RARE (Preservation of Rare and Endangered Species)
SPWN (Fish Spawning)
WILD (Wildlife Habitat)
REC-2 (Noncontact Recreation)
COMM (Ocean, Commercial, and Sport Fishing)
FRSH (Freshwater Replenishment)
MIGR (Fish Migration)
PROC (Industrial Process Supply)
SHELL (Shellfish Harvesting)
WARM (Warm Freshwater Habitat)
REC-1 (Body Contact Recreation)

SOURCE: RWQCB, 2010

The Basin Plan identifies municipal supply, industrial process water supply, industrial service water supply, and agricultural supply as existing beneficial uses for the East Bay Plain Groundwater Basin.

### Total Maximum Daily Loads

As described above under Section 303(d) of the Clean Water Act, states must present the USEPA with a list of "impaired water bodies," defined as those water bodies that do not meet water quality standards. As discussed under Water Quality in the Setting section above, the San Francisco Bay RWQCB has listed San Pablo and Wildcat Creeks as impaired water bodies owing to the presence of diazinon. Central San Francisco Bay and San Pablo Bay are identified as impaired water bodies for chlordane, DDT, dieldrin, dioxin compounds, furan compounds, invasive species, mercury, PBCs, dioxin-like PCBs, and selenium. San Pablo Creek, Baxter Creek, Cerrito Creek, and Central San Francisco Bay are also listed as impaired water bodies for trash.

TMDLs have been approved by the USEPA and officially incorporated into the Basin Plan for diazinon and pesticide-related toxicity in urban creeks, as well as PCBs and mercury in San Francisco Bay (SWRCB, 2012c). Development of a TMDL for selenium in North San Francisco Bay began in 2007. TMDLs are expected for chlordane, DDT, and dieldrin by 2013; dioxin compounds, furan compounds, and invasive species by 2019; and trash by 2021 (SWRCB, 2010).

## *NPDES Waste Discharge Regulations*

As discussed above in Federal Regulations, Section 402 of the federal Clean Water Act established the NPDES program to protect water quality. The NPDES program requires all facilities that discharge pollutants into waters of the United States to obtain a permit. NPDES permits must also incorporate TMDL wasteload allocations when they are developed.

The regulations initially focused on municipal and industrial wastewater discharges in 1972, followed by stormwater discharge regulations, which became effective in November 1990. NPDES permits for wastewater and industrial discharges specify discharge prohibitions and effluent limitations and also include other provisions (such as monitoring and reporting programs) deemed necessary to protect water quality. In California, the SWRCB and the RWQCBs implement and enforce the NPDES program.

#### Construction General Stormwater Permit (SWRCB Order No. 2009-09-DWQ)

For stormwater discharges associated with construction activity in the state of California, the SWRCB has adopted the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ (Construction General Stormwater Permit), intended to avoid and minimize water quality impacts attributable to such activities. The Construction General Stormwater Permit became effective on July 1, 2010 and expires on September 2, 2014; it applies to all projects where construction activity disturbs one or more acres of soil, including linear utility projects such as the proposed Project. Construction activities subject to this permit include clearing, grading, and disturbances to the ground, such as stockpiling or excavation. The Construction General Stormwater Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which includes and specifies best management practices (BMPs) designed to prevent pollutants from contacting stormwater and keep all products of erosion and stormwater pollutants from moving off-site into receiving waters.

Linear Underground/Overhead Projects (LUPs) are categorized as Type 1, Type 2, or Type 3 based on threat to water quality. These types are defined as follows:

- Type 1 LUPs are those that include 70 percent or more construction on a paved surface; include greater than 30 percent of the construction activities within the non-paved shoulders or land immediately adjacent to paved surfaces, or where construction occurs on unpaved improved roads; and where there is a low sediment risk and low or medium receiving water risk, or a medium sediment risk and low receiving water risk.

- Type 2 LUPs are those with a high sediment risk and low receiving water risk, medium sediment risk and medium receiving water risk, or low sediment risk and high receiving water risk.

- Type 3 LUPs are those with a high sediment risk and medium or high receiving water risk or medium sediment risk and high receiving water risk.

Sediment risk is determined based on the expected intensity of rainfall during the construction period, soil erodibility, and slope of the construction site. Receiving water risk is based on whether a project drains to a sediment-sensitive water body. A sediment-sensitive water body is one that appears on the most recent 303(d) list for water bodies impaired for sediment; has a USEPA-approved TMDL implementation plan for sediment; or has the beneficial uses of cold freshwater habitat, fish migration, and fish spawning.

Receiving water risk is considered low for those areas of a project that are not near a sensitive receiving watershed. The risk is medium for those areas within a sensitive receiving watershed, yet outside of the floodplain of a sensitive water body and high where soil disturbance is near a sensitive receiving water body. Both Wildcat and San Pablo Creeks may be considered sediment-sensitive water bodies because they have beneficial uses of cold freshwater habitat, fish migration, and fish spawning.

In accordance with the Construction General Stormwater Permit, the following requirements apply to LUP projects:

- Stormwater discharges and authorized non-stormwater discharges from all LUP projects cannot contain hazardous substances above reportable quantities unless a separate NPDES permit has been issued for those discharges, and dischargers are required to minimize or prevent pollutants in stormwater discharges and authorized non-stormwater discharges through the use of controls, structures, and implementation of BMPs. LUP Type 2 and 3 dischargers are also subject to a pH Numeric Action Level (NAL) of 6.5 to 8.5 and a turbidity NAL of 250 nephelometric turbidity units (NTU).[2]

- The SWPPP must include minimum BMPs related to housekeeping (storage of construction materials, waste management, vehicle storage and maintenance, landscape materials, pollutant control); non-stormwater management; erosion control; sediment control; and run-on and run-off control. Additional requirements apply to LUP Type 2 and 3 projects, including construction of mandatory sediment controls along the toe slopes, face of the slope, and grade breaks where construction occurs; limiting access points to and from the construction site; protecting storm drain inlets and providing perimeter controls, run-off controls, and pollutant controls at entrances and exits; and inspecting immediate access roads and removing any sediment or other construction-related materials deposited on the roads (by vacuuming or sweeping). Type 3 LUP projects can be required to implement additional site-specific sediment controls to further protect surface water quality.

- The discharger must implement a monitoring and program as part of the SWPPP, including inspections by trained personnel to demonstrate compliance with the discharge prohibitions of the Construction General Stormwater Permit.

- After construction, LUP Type 2 and 3 projects must implement a monitoring program for inspecting areas that require temporary or permanent stabilization BMPs after construction is completed.

- LUP Type 2 and 3 projects are also required to collect grab samples of any stormwater discharges to determine compliance with NALs of 6.5 to 8.5 for pH and 250 NTU for turbidity. Dischargers must file a NAL exceedance report and immediately implement additional BMPs and revise the SWPPP if NALs are exceeded.

[2] Order No. 2009-0009-DWQ also specifies Numeric Effluent Limitations and associated receiving water limitations for Risk Level 3 LUP sites. However, on December 27, 2011, the Superior Court issued a judgment and peremptory writ of mandate in *California Building Industry Ass'n et al. v. State Water Resources Control Bd.* The State Water Board will be amending Order 2009-0009-DWQ in accordance with the peremptory writ of mandate to remove the NELs and associated receiving water limitations. The draft amendment was circulated to the public in March 2012, and is scheduled for State Water Board adoption by July, 2012 (SWRCB, 2012b).

- In accordance with proposed revisions to the Construction General Stormwater Permit, LUP Type 3 projects must conduct receiving water sampling if effluent analytical results exceed the Receiving Water Monitoring Trigger levels of 6.0 to 9.0 for pH or 500 NTU for turbidity.[3]

At sites where traditional erosion and sediment controls do not effectively control accelerated erosion, and stormwater discharges have the potential to contribute to an exceedance of a water quality standard, it may be necessary to use an Active Treatment System to avoid impacts to water quality. Discharges from the system must comply with the discharge limitations of the Construction General Stormwater Permit.

The Construction General Stormwater Permit is implemented and enforced by the San Francisco Bay RWQCB, which administers the stormwater permitting program for the program area. Dischargers are required to submit a notice of intent (NOI) and permit registration documents (PRDs) to obtain coverage under this Construction General Stormwater Permit. Dischargers are responsible for notifying the relevant RWQCB of violations or incidents of non-compliance, as well as for submitting annual reports identifying deficiencies of the BMPs and how the deficiencies were corrected.

#### Municipal Regional Stormwater NPDES Permit (SWRCB Order No. R2-2009-0074)

Stormwater in Alameda and Contra Costa Counties is managed in accordance with the Municipal Regional Stormwater NPDES permit from the San Francisco Bay RWQCB (Permit No. R2-2009-0074 adopted on October 14, 2009 and revised on November 28, 2011). This permit regulates discharges from all municipal separate storm sewer systems in Alameda and Contra Costa Counties, including those of the cities of Berkeley, El Cerrito, Richmond, and San Pablo.

Provision C.3 to the municipal stormwater permit, requires new development and redevelopment projects that create or replace 5,000 square feet or more of impervious surfaces to incorporate treatment measures, source control measures, and site design features to reduce the pollutant load in stormwater discharges and to manage run-off flows. Provision C.3 does not apply to the proposed Project because the majority of construction would be conducted in existing developed city streets, and no new impervious surfaces would be constructed.

Provision C.6 of the municipal stormwater permit requires municipalities subject to the permit to adopt a construction site inspection and control program at all construction sites. Municipalities must review construction-site erosion control plans for consistency with local requirements, including the appropriateness and adequacy of proposed BMPs. They also must verify that site operators/developers have complied with the Construction General Stormwater Permit before issuing the grading permit for a project. The municipalities also are required to conduct inspections to determine compliance with local grading and stormwater requirements.

3 Receiving Water Monitoring Trigger Levels and the requirement for receiving water sampling are specified in the draft revisions to the Construction General Stormwater Permit published on March 30, 2012 (SWRCB, 2012a). There will be a public hearing on these proposed changes on July 17, 2012. These requirements will not become final until the order is adopted.

### *California Fish and Game Code*

Under the California Fish and Game Code, the California Department of Fish and Wildlife (CDFW) has jurisdiction over any activity that could affect the bank or bed of any stream that has value to fish and wildlife. If any changes are proposed along a creek or waterway within its jurisdiction, a streambed alteration agreement would be required under California Fish and Game Code Section 1602.

## Local Policies

California Government Code section 53091(d) specifies that "Building ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, wastewater, or electrical energy by a local agency." Subsection (e) further states that "Zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water...." Consequently, this Project is not subject to certain local ordinances and permit requirements. Nonetheless it is EBMUD's practice to always coordinate closely with host jurisdictions and the neighboring community during project planning, and to implement its projects consistent with local requirements to minimize any adverse environmental effects, to the extent feasible. To facilitate this coordination, local requirements related to stormwater management, drainage, and watercourse protection are described below. Further, EBMUD has consulted and held meetings with the local jurisdictions, and will continue to consult with local entities on issues related to the protection of water quality during the project planning process.

### *Stormwater*

#### Contra Costa Clean Water Program

The Contra Costa Clean Water Program is the local entity within Contra Costa County responsible for implementing compliance with the Municipal Regional Stormwater NPDES permit. It comprises Contra Costa County, 16 incorporated cities (including El Cerrito, Richmond, and San Pablo), and the Contra Costa County Flood Control and Water Conservation District.

#### Alameda Countywide Clean Water Program

The Alameda Countywide Clean Water Program is the local entity within Alameda County responsible for implementing compliance with the Municipal Regional Stormwater NPDES permit. It comprises Alameda County, 13 incorporated cities (including Berkeley), the Alameda County Flood Control and Water Conservation District, and the Zone 7 Water Agency.

#### Local Stormwater Management Ordinances

All of the municipalities where construction would occur have passed local stormwater management ordinances, as described below. If the project disturbs more than one acre of land, each municipality also requires the project sponsor to provide documentation that they have filed an NOI in accordance with the Construction General Stormwater Permit.

**Berkeley.** Chapter 17.20 of the Berkeley Municipal Code, Discharge of Non-Stormwater into the City's Storm Drain System – Reduction of Stormwater Pollution, requires implementation of all practicable measures to reduce or prevent the contamination of stormwater by pollutants. For construction projects, these measures include, but are not limited to, prohibition of littering; providing filter materials at catch basins to retain any debris, dirt, or other pollutants generated at the construction site; and implementing appropriate BMPs for construction activity. Water produced from flushing of water line or other discharges of potable water are exempted from this section of the Berkeley Municipal Code. Uncontaminated pumped groundwater is also exempted when measures are taken to minimize the amount of groundwater discharged.

**El Cerrito, Richmond, and San Pablo.** The municipal code sections of the Cities of El Cerrito, Richmond, and San Pablo that apply to stormwater discharges are as follows:

- Chapter 12.22 of the Richmond Municipal Code, Stormwater Management and Discharge Control
- Chapter 8.40 of the El Cerrito Municipal Code, Stormwater Management and Discharge Control
- Chapter 8.40 of the San Pablo Municipal Code, Stormwater Management and Discharge Control

In accordance with these sections, all construction activities must conform to the requirements of the California Stormwater Quality Association (CASQA) Stormwater Best Management Practices Handbook for Construction Activities and New Development and Redevelopment, the Association of Bay Area Governments (ABAG) Manual of Standards for Erosion and Sediment Control Measures, the city's grading and erosion control ordinance, and other generally accepted engineering practices for erosion control. The municipal codes prohibit the release of non-stormwater discharges to the city storm sewer system, but discharges of uncontaminated groundwater and potable water discharges are exempted.

### *Contra Costa County Flood Control Ordinance*

Contra Costa County requirements for work within a watercourse or drainage facility are specified in Title 10, Chapter 1010 of the Contra Costa County Code. This chapter was adopted to provide for implementation of drainage, recreation, and riparian vegetation requirements of the Contra Costa County General Plan. The code provides protection for watercourse riparian vegetation, requires Flood Control Encroachment Permits for projects that may change the hydraulic characteristics of watercourses and drainage facilities, controls erosion and sedimentation, prevents the placement or discharge of polluting matter into watercourses, and requires adequate watercourse drainage facilities. This Contra Costa County code requires a permit for any work that could impair, impede, or obstruct the natural flow of stormwater or other water running in a defined channel; deposit any material in a defined channel; excavate, grade, or otherwise alter the surface of land so as to reduce the capacity of a defined channel; destroy or significantly alter riparian or bank-stabilizing vegetation; plant any shrub, vine, or tree within a riparian corridor; construct, alter, or repair any stormwater drainage structure, facility, or channel;

commit to an act that would impair the use of an easement; or construct new non-drainage structures, or improvements to structures, within watercourses.

The permit requires submittal of engineered plans and specifications showing the work to be done and necessary engineering information, such as soil investigations and materials tests. Hydrology and hydraulic calculations must be provided for projects that may affect the capacity of a drainage system. All trenches must be backfilled with suitable materials and compacted to a relative compaction of 90 percent, and applicants proposing alterations to, or bank repairs in, a watercourse must show that the changes will not adversely affect the hydraulic capacity of the watercourse. The Contra Costa County Flood Control and Water Conservation District inspects all permitted work at completion to ensure compliance with the provisions of Chapter 1010 of the Contra Costa County Code and specific permit conditions.

The Central Pressure Zone Pipeline (Richmond/San Pablo) crossing of San Pablo Creek is located in Flood Control Zone 6, Drainage Area 73, of the Contra Costa County Flood Control and Water Conservation District; and the Wildcat Creek crossing is located within Flood Control Zone 7, outside of a Contra Costa County Formed Drainage Area.[4] Therefore, construction at these creek crossings would be subject to the requirements of Chapter 1010 of the Contra Costa County.

### *Other Local Ordinances*

Each of the municipalities within the project area has adopted municipal codes related to watercourse protection as well as construction within flood zones. The applicable municipal code sections are summarized in **Table 3.10-2**. In general, these code sections apply:

- Prohibit filling, obstructing, or interfering with a watercourse. The City of Berkeley also specifies that construction within 25 feet of the centerline of a culverted creek is subject to administrative review by the City and requires an investigation to identify the specific location of the centerline. For projects within 15 feet of the centerline based on this investigation, a report is required from a structural engineer that establishes that the structural integrity of the culvert will not be compromised by the proposed construction, the proposed construction will not impede access to repair and maintain the culvert, and the flow of the creek will not be impeded nor its water quality impaired. A Culverted Creek Permit is required for work within 15 feet of the centerline of a culverted creek. For construction activities near an open creek, the City of Berkeley code section requires that construction activities do not degrade water quality from increased sedimentation and particulates from disturbed soils, pollution from motor oil, or from toxics or trash around construction sites. These regulations require an encroachment permit for work over, within, or under a watercourse and within the right-of-way of the municipality.

- Specify that all new construction must be anchored to prevent flotation, collapse, or lateral movement, and that proposed non-residential structures are elevated to or above the base flood elevation or are capable of resisting flood loads and effects of buoyancy.

[4] Drainage Areas are formed to collect fees from developers to pay for planned drainage infrastructure, including detention basins, pipes, channels, and related costs. An unformed drainage area is a watershed that has been identified, but does not have development fees.

**TABLE 3.10-2**
**APPLICABLE MUNICIPAL CODE SECTIONS**

| Municipality | Watercourse Protection and Encroachment Permits | Flood Zone Development/ Flood Damage Prevention |
|---|---|---|
| Berkeley | Chapter 17.08 of the Berkeley Municipal Code | Chapter 17.12 of the Berkeley Municipal Code |
| El Cerrito | Chapter 13.40 of the El Cerrito Municipal Code | Chapter 8.35 of the El Cerrito Municipal Code |
| Richmond | Chapter 12.08 of the Richmond Municipal Code | Chapter 12.56 of the Richmond Municipal Code |
| San Pablo | Chapter 13.04 of the San Pablo Municipal Code | Chapter 15.28 of the San Pablo Municipal Code |

## EBMUD Policies and Procedures

### *Potable Water Discharges*

EBMUD is working with the RWQCB to establish an NPDES permit for discharges from their potable water transmission, storage, and distribution system to address planned, unplanned, and emergency discharges. Until a permit is adopted, EBMUD and its contractors will follow the procedures described in Section 3 of the EBMUD Environmental Compliance Manual which were developed in collaboration with the RWQCB (EBMUD, 2010). In accordance with these procedures, EBMUD or its contractor must implement specific actions for planned and unplanned discharges to a storm drain system or receiving water as follows:

- For planned discharges, EBMUD submits a site-specific Discharge Plan to the RWQCB at least one week in advance of the discharge with copies to interested parties such as flood control agencies and downstream jurisdictions. The Discharge Plan must include the project name and reason for the discharge; a description of the discharge; a map showing the discharge location(s) and receiving water(s); the estimated time, duration, volume, and flowrate of the discharge; and a monitoring plan for the chlorine residual, pH, and turbidity of the discharge. The maximum monitoring schedule for residual chlorine is every 15 minutes for the first 2 hours and daily thereafter. Once the Discharge Plan is approved, the RWQCB will issue a non-action letter specifying approval of the discharge.

- For unplanned discharges, EBMUD and its contractors must implement BMPs to alleviate the discharge. Certain discharges must be reported to the California Emergency Management Agency and RWQCB within 24 hours, followed by a written report within 5 days. EBMUD must also submit an annual report to the RWQCB summarizing the date, address, estimated flow rate, and BMPs implemented for each unplanned discharge.

In accordance with the EBMUD Environmental Compliance Manual, EBMUD employs Source Control BMPs whenever practical to reduce pollutants at their source rather than applying Treatment Control BMPs. Typical source controls include isolating a system for several days and/or reducing or eliminating chemical dosages to allow the chlorine residual and pH levels to naturally comply with regulatory limits; transferring the contents via truck to a wastewater treatment plant; and minimizing the flow rate and/or volume to reduce potential sedimentation and erosion effects. Typical treatment BMPs include dechlorinating the discharge with tablets or liquid calcium thiosulfate. For large-volume discharges to a creek, EBMUD has developed a draft methodology to control erosion that consists of a phased approach to ensure that the discharge flows will be below the level that would cause large increases in erosion in the receiving water body.

For discharges of superchlorinated water such as is used for pipeline disinfection (typically with chlorine concentrations of 100 to 300 milligrams per liter (mg/L)), the EBMUD Environmental Compliance Manual also requires placement of BMPs at all affected storm drains, even if there are no planned discharges; photo documentation of all BMP installations; documented calculation of the amount of dechlorination agent necessary to dechlorinate the planned discharge; measurement and recording of the amount of dechlorination agent used; provision of creek maps to all dechlorination vans to ensure awareness of sensitive creeks; and documentation of the amount of water discharged to the sanitary sewer under a permit or trucked off-site. All superchlorinated discharges, whether dechlorinated or not, must be made in one of several ways including discharge to a sanitary sewer or interceptor in compliance with a permit; to the EBMUD wastewater treatment plant; or other approved disposal methods. Superchlorinated water transported off-site for disposal must be dechlorinated prior to transport, and dechlorination may also be required for discharge to a sanitary sewer system. Under normal conditions, discharge to a storm drain or creek is not permitted, but emergency discharges of superchlorinated water may be dechlorinated and discharged to the storm sewer system.

### *Leak Detection Program*

EBMUD annually surveys over 200 miles of pipe that is 20 inches and smaller (approximately 5 percent of the entire distribution system) to identify and pinpoint leaks prior to a pipeline failure (EBMUD, 2010). To identify areas for further investigation and guide repairs, portable computer-aided correlation equipment that amplifies the sound of leaks and records the results is rotated throughout the service area.

The forms of leak detection traditionally used for the annual surveys are only effective on smaller pipelines and in 2006, EBMUD embarked on a 4-year project to test new technologies on representative pipelines and aqueducts of larger diameters with partial funding from a grant from the United States Bureau of Reclamation. The study tested three technologies that showed initial promise on 63 miles of large diameter pipelines (EBMUD, undated). Based on the results, the study concluded that there are now effective technologies for finding leaks on large pipes that were not available a few years ago. Future inspections of large diameter pipelines have not been scheduled.

### *Leak Response Program*

EBMUD maintains a dispatch center and field crew 24 hours per day, 7 days per week to respond to emergencies. When a leak is reported, an EBMUD inspector typically responds on-site within one hour (EBMUD, 2010) and the inspector is fully equipped and authorized to implement leak control BMPs immediately upon arrival, if safe to do so. Once immediate BMPs are implemented, the inspector assigns a leak repair priority based on factors such as safety, customer impacts, environmental impacts, property damage, discharge rate, and traffic impacts.

### *EBMUD Standard Construction Specifications*

Section 01 35 44 of EBMUD's Master Specifications, Environmental Requirements, includes provisions for the protection of water quality. Regarding site activities, the specifications require the construction contractor to:

- Prevent the discharge of debris, soil, silt, sand, and any other organic or earthen materials to a surface water or storm drain system. Discharges of asphalt, rubbish, paint, oil or petroleum products, cement and concrete or washings thereof are also prohibited. These materials may also not be stored where they can be washed outside of the construction limits by rainfall or runoff. When construction is completed, these materials must be disposed of in accordance with the Construction and Demolition Waste Disposal Plan.
- Prevent creation of a nuisance pollution as defined in the California Water Code, and may not cause a violation of water quality standards for receiving waters adopted by the RWQCB or SWRCB.
- Clean up spills immediately, and notify EBMUD in the event of a spill.
- Equip stationary equipment such as motors, pumps, and generators with drip pans.
- Divert or otherwise control surface water and other waters flowing onto the work areas. The methods of diversions or control must be adequate to ensure the safety of stored materials and personnel in the work area. At the completion of work, ditches, dikes, and other ground alterations made by the contractor must be removed and ground conditions must be returned to their former condition.
- Maintain construction sites to ensure that drainage from the site will minimize erosion of stockpiled or stored materials and the adjacent native soil material.
- Conduct dust control measures in a manner to prevent runoff from the site.
- Handle, store, apply, and dispose of any chemical or hazardous material in accordance with federal, state, and local laws and regulations.

Regarding compliance with the Stormwater General Construction Permit, the contractor must prepare the permit registration documents, including the SWPPP, subject to review and approval by EBMUD. The contractor must also comply with all permit requirements, including implementation of effective stormwater/non-stormwater management, conducting inspections and monitoring requirements of the permit, and ensuring permit coverage termination at the completion of construction by preparing a Notice of Termination.

In addition to implementing stormwater management requirements, EBMUD's Master Specifications require the contractor to prepare a detailed water control and disposal plan describing compliance with the project construction specifications, as well as the requirements of the RWQCB, CDFW, county flood control district, and any other regulatory agency having jurisdiction. The plan must describe methods for containment, handling, and disposal of groundwater (if encountered), run-off water used for dust control, tank heel, wash water, test water, and construction water, or other liquid that has been in contact with any interior surfaces of EBMUD facilities. A sampling and analytical plan program for characterizations of any wastewater prior to disposal must be included, as needed. The contractor is required to obtain permits from any agency having jurisdiction over the discharge and provide EBMUD with documentation of authorization to discharge.

The contractor must also prepare a spill prevention and response plan detailing the means and methods for preventing and controlling a spill of hazardous materials used on the job site. The plan must include a list of the hazardous materials used or generated on the construction site and methods that will be used to prevent spills, monitor hazardous substances, and provide immediate response to spills. Spill response measures must address notification of EBMUD, issues related to spill-related workers as well as public health and safety, spill control, and spill cleanup.

# 3.10.3 Impacts and Mitigation Measures

## Significance Criteria

For the purposes of this report and consistent with Appendix G of the CEQA Guidelines, the West of Hills Northern Pipelines Project is considered to have a significant impact if it would:

- Violate any water quality standards or waste discharge requirements.
- 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).
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.
- 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 rate or amount of surface runoff in a manner which would result in flooding on- or off-site.
- 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.
- Otherwise substantially degrade water quality.
- 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.
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows.
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Inundation by seiche, tsunami, or mudflow.

## Approach to Analysis

### *Methodology*

The analysis of project impacts on hydrology and water quality focuses on potentially significant impacts during construction. These include the potential for sediments or hazardous substances from project construction activities to be released into nearby water bodies; water quality impacts resulting from discharges (both groundwater produced from construction dewatering and treated water from pipeline draining) to watercourses; and impedance or redirection of flood flows during construction. Long-term impacts would not be substantial because the Project would not involve discharges from the pipelines to a watercourse or change drainage patterns or stream flow conditions as a result of construction. However, this section discusses the possible long-term effect on flood hazards and demonstrates why the related impacts would be less than significant.

Based on project characteristics and the water resources in the area, no impacts are anticipated with respect to the following topics:

- ***Groundwater Resources and Recharge.*** Groundwater dewatering could be required during construction of the proposed West of Hills Northern Pipelines. However, this dewatering would be short-term and the post-construction groundwater levels would return to pre-project conditions once construction is completed. No long-term groundwater dewatering would be required. Further, the Project would not include the creation of any new impervious surfaces or other features that would interfere with groundwater recharge. Therefore, the Project would not substantially deplete groundwater supplies or interfere with groundwater recharge.

- ***Drainage Patterns.*** With the exception of the pipe bridge over San Pablo Creek constructed for the Central Pressure Zone Pipeline (Richmond/San Pablo), all of the West of Hills Northern Pipelines would be constructed below ground within existing streets. At the completion of construction, all excavations would be backfilled and the ground surface would be restored to pre-existing conditions. Therefore, Project-related construction activities would not alter drainage patterns in any way that would result in substantial erosion, siltation, or flooding on- or off-site. Impacts associated with construction of the pipe bridge across San Pablo Creek are discussed in Impact 3.10-3, below.

- ***Stormwater Drainage System Capacity and Polluted Runoff.*** The West of Hills Northern Pipelines would be constructed within existing streets, and at the completion of construction, all excavations would be backfilled and the ground surface would be restored to pre-existing conditions. The pipe bridge constructed over San Pablo Creek would not include the construction of new impervious surfaces. Therefore, the Project would not create a new source of stormwater runoff that could exceed the capacity of the existing storm drain system or provide an additional source of polluted runoff. Additionally, while EBMUD may discharge water to the stormwater drainage system as the result of dewatering and pipeline flushing, these discharges would comply with permit conditions that limit the rate of discharge. As a result, the capacity of the stormwater drainage system would not be exceeded, and it would not interfere with homeowners' use of the stormwater drainage system to pump water from their homes.

- ***Placement of Housing within a 100-Year Flood Zone.*** The West of Hills Northern Pipelines Project does not propose the construction of housing, so there would be no impact related to the construction of housing within a 100-year flood zone.

- ***Flooding from Failure of a Dam or Levee.*** As discussed in the Setting section, above, the alignments of the proposed West of Hills Northern Pipelines traverse the inundation zone of several EBMUD reservoirs. However, the Project would not include the construction of permanent above-ground structures within the zone of inundation, and construction activities within the zone of possible inundation would be limited. There is a very low likelihood that a dam failure would occur during the construction period.

- ***Inundation by Seiche, Tsunami, or Mudflow.*** As discussed in the Setting section, above, none of the proposed pipeline alignments are located within an area identified for potential inundation in the event of a tsunami or seiche. Although Round Top, an ancient volcano, is located in Sibley Volcanic Regional Preserve to the west of the city of Orinda, this volcano was active about 10 million years ago as a result of tectonic activity to the south of the Bay Area that has subsequently shifted north. The volcano is now extinct; therefore, none of the pipeline alignments are located near a volcano or other geologic feature capable of producing mudflows.

## Impacts and Mitigation Measures

**Impact 3.10-1: Degradation of water quality as a result of erosion and sedimentation or a hazardous materials release during construction (applies to all pipelines).**

Construction activities for the West of Hills Northern Pipelines Project would generally be confined within existing roadways. In these roadways, the pipelines would be installed primarily by using open-cut excavation (trenches) in the streets and jack and bore methods below Wildcat Creek, both of which require excavation of soil. Direct disruption to creek beds or surface waters would be limited to construction of the pipe bridge at San Pablo Creek, where the pipe would be supported on bridge footings located above the high water mark in San Pablo Creek. The total land disturbance for the construction of the four pipelines would be about five acres, and approximately 65,000 cubic yards of soil would be excavated.

Excavation along the proposed Wildcat Pipeline (El Cerrito), Central Pressure Zone Pipeline (El Cerrito/Richmond), northern portion of the Wildcat Pipeline (Berkeley), and southern portion of the Central Pressure Zone Pipeline (Richmond/San Pablo) alignments would occur entirely along public rights-of-way, and construction-related stormwater runoff would discharge to the city storm drain systems that ultimately discharge to San Francisco Bay. Exposed soil from stockpiles and excavated areas could be transported by wind or stormwater and, if not properly managed, could accumulate in storm drains and increase the sediment load (turbidity) in the stormwater runoff as well as reduce the flood carrying capacity of the drains. In addition, construction activities would use hazardous materials such as adhesives, solvents, paints, and petroleum lubricants, which, if not managed appropriately, could become mobilized by run-off and contribute to non-point source pollution (see also Section 3.9, Hazardous Materials, for a discussion of project impacts regarding hazardous materials used during construction). Temporary storage of construction materials and equipment in work areas and staging areas also creates the potential for a release of hazardous materials or sediment to the storm drain system.

However, in accordance with Section 01 35 44 of EBMUD's Master Specifications (described in the Setting section above), the contractor would be required to implement specific measures to control construction-related erosion and sedimentation and the discharge of pollutants in stormwater runoff. These measures, and additional measures as needed, would be specified in the SWPPP prepared in accordance with the Construction General Stormwater Permit. Because the Wildcat Pipeline (El Cerrito), Central Pressure Zone Pipeline (El Cerrito/Richmond), Wildcat Pipeline (Berkeley) west of Claremont Avenue, and Central Pressure Zone Pipeline (Richmond/San Pablo) south of Wildcat Creek do not cross any sediment-sensitive water bodies, the SWPPP would specify the measures required for Type 1 LUP projects related to housekeeping (storage of construction materials, waste management, vehicle storage and maintenance, landscape materials, pollutant control); non-stormwater management; erosion control; sediment control; and run-on and run-off control, at a minimum. This section would also require the construction contractor to prepare a spill prevention and response plan detailing the means and methods for preventing and controlling a spill of hazardous materials used on the job site.

Further, any construction under or across creek channels in Contra Costa County would occur within the right-of-way of the Contra Costa County Flood Control and Water Conservation District and would require a Flood Control Encroachment Permit. This permit would require proof of correspondence with CDFW and USACE to assure that construction activities are in compliance with applicable regulations of those agencies with jurisdiction over wetlands or stream beds. The drainage and water course protection ordinances for each city would be accommodated to the maximum extent practical. Compliance with these requirements would ensure that impacts related to degradation of water quality as a result of erosion and sedimentation or a hazardous materials release during construction would be *less than significant* for the Wildcat Pipeline (El Cerrito), Central Pressure Zone Pipeline (El Cerrito/Richmond), northern portion of the Wildcat Pipeline (Berkeley), and southern portion of the Central Pressure Zone Pipeline (Richmond/San Pablo).

However, without proper precautions, construction activities at the southern end of the proposed Wildcat Pipeline (Berkeley) could result in direct discharges to Harwood Creek where the pipeline would cross the creek. This is because the creek is within its natural banks on the east side of The Uplands (the roadway in which the crossing would be constructed) and the crossing would be constructed in the shallow flooding zone of the creek identified by FEMA.

Construction activities within the bed and bank of San Pablo Creek for the pipeline bridge at the northern end of the Central Pressure Zone Pipeline (Richmond/San Pablo) could result in direct discharges to San Pablo Creek without appropriate precautions. Excavation for jack and bore pits at the Wildcat Creek crossing would also be conducted near to the creek and within the 100-year flood zone for the creek and could similarly result in direct discharges to Wildcat Creek without appropriate precautions. Wildcat and San Pablo Creeks are considered sediment-sensitive water bodies because they have beneficial uses of cold freshwater habitat, fish migration, and fish spawning.

Where construction would occur near Harwood Creek, the requirements for Type 1 LUPs may apply. Where construction would occur near Wildcat Creek or within the bed and bank of San Pablo Creek, the requirements for Type 2 or 3 LUPs may apply, depending on the timing of construction. Additional BMPs that could be required for these Type 2 and Type 3 segments include construction of mandatory sediment controls along the toe of slopes, face of the slope, and at grade breaks; limiting access points to and from the construction site; protecting storm drain inlets and providing perimeter controls, runoff controls, and pollutant controls at entrances and exits; inspecting immediate access roads; and removing any sediment or other construction-related materials deposited on the roads (by vacuuming or sweeping).

Compliance with EBMUD's Master Specifications, including compliance with the Construction General Stormwater Permit, as well as Contra Costa County Flood Control and Water Conservation District requirements for construction near Wildcat Creek and San Pablo Creek, would reduce the potential for adverse water quality impacts related to construction near these creeks and Harwood Creek. However, because of the sensitivity of these water bodies and the proximity of construction to the creeks, impacts related to degradation of water quality as a result of erosion and sedimentation or a hazardous materials release during construction would be potentially significant at these creek crossings. Implementation of Mitigation Measure HYD-1**,** Schedule Construction Activities at Harwood Creek, Wildcat Creek, and San Pablo Creek During the Dry Season, requiring contractors to schedule construction activities in the 100-year flood zones of these creeks during the dry season (i.e., between June 1 and October 15) would reduce this impact to *less than significant* by ensuring that construction debris and equipment are not subjected to flooding and heavy winter storms that could overwhelm construction BMPs implemented as part of the SWPPP.

**Mitigation Measure HYD-1: Schedule Construction Activities at Harwood Creek, Wildcat Creek, and San Pablo Creek During the Dry Season.**

The SWPPP, to be submitted in accordance with the Construction General Stormwater Permit, will include a schedule for construction activities that specifies a timeline for earthmoving activities, hydroseeding, and stabilization of soils and slopes. Incorporate into contract specifications that, in addition to the requirements of the Construction General Stormwater Permit, the contractor will limit construction activities within the 100-year flood zones of Harwood Creek, Wildcat Creek, and San Pablo Creek to the dry season. The schedule will indicate that all earthmoving activities at these creeks will occur during the dry season (i.e., between June 1 and October 15), unless otherwise negotiated with the appropriate regulatory agencies. The construction schedule will also specify that all materials for soil stabilization be on-site by September 15 and that site stabilization be completed by October 15.

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**Impact 3.10-2: Degradation of water quality resulting from discharges during dewatering of trenches and discharges of treated water (applies to all pipelines).**

### Groundwater Dewatering Discharges

Open-cut excavation for pipeline installation and excavation for the jack and bore pits could require groundwater dewatering to maintain a dry work area. Groundwater produced during dewatering would be discharged to the sanitary sewer system or storm drain system, each of which are under the jurisdiction of the local agencies, including the cities of Berkeley, El Cerrito, Richmond, and San

Pablo. Discharge to the storm drain system would ultimately result in discharge to a surface water. Depending on the quality of the groundwater, such discharge to could affect surface water quality.

As discussed in Section 3.9, Hazards and Hazardous Materials, there are a number of sites with current or historic soil or groundwater contamination located along within ¼-mile of each of the proposed pipeline alignments. Soil or groundwater contamination at one of these sites could potentially affect groundwater quality within the proposed pipeline alignments. Because the majority of sites are leaking underground storage tank sites, the primary contaminant of concern would be gasoline or other petroleum products. However, solvents could also be encountered near historic dry cleaning facilities that are undergoing site investigation or remediation.

### Treated Water Discharges

The new pipelines would be pressure tested with potable water and once any identified leaks are repaired, the water would be chlorinated by adding highly chlorinated water at one end of the pipeline. This superchlorinated water, with chlorine levels of approximately 100 to 300 mg/L, would be flushed through the pipelines and discharged. In all, 2 to 3 pipeline volumes of water would be discharged during this process, assuming that no testing needs to be redone. The maximum volumes that would be discharged from each pipeline for pressure testing and disinfection are 2.4 million gallons from the proposed Wildcat Pipeline (Berkeley), 2.2 million gallons from the proposed Wildcat Pipeline (El Cerrito), 2.1 million gallons from the proposed Central Pressure Zone Pipeline (El Cerrito/Richmond) and 1.7 million gallons from the proposed Central Pressure Zone Pipeline (Richmond/San Pablo).

In accordance with EBMUD's Environmental Compliance Manual described above under "EBMUD Policies and Procedures," the superchlorinated water produced during these activities would be discharged to a sanitary sewer or interceptor in compliance with a permit; to the EBMUD wastewater treatment plant; or other approved disposal methods. If transported off-site for disposal the water would be dechlorinated prior to transport, and dechlorination may also be required for discharge to a sanitary sewer system. Under normal conditions, the water would not be discharged to a storm drain or creek, but emergency discharges of superchlorinated water may be dechlorinated and discharged to the storm sewer system. Discharge to the storm drain system would ultimately result in discharge to a surface water, and the Basin Plan prohibits the discharge of chlorine or other substances that are toxic to aquatic organisms into reservoirs, creeks, or other waters of the state.

### Discharge Requirements

In accordance with Section 01 35 44 of the EBMUD Master Specifications, described in the Setting section above, the contractor would be required to prepare a water control and disposal plan for any groundwater or treated water to be discharged. Consistent with the EBMUD Environmental Compliance Manual (described in the Setting above), a site-specific Discharge Plan would be developed and submitted to the RWQCB. The Discharge Plan would require that discharges of groundwater are treated to remove contaminants as needed to meet discharge requirements and that treated water would be dechlorinated (if discharged to the storm drain system). Implementation of a monitoring plan would also be required to ensure that the discharge meets regulatory limits for all parameters, including chlorine residual, pH, and turbidity.

For discharges of superchlorinated water, EBMUD or its contractor would place BMPs at all adjacent storm drains, even if there are no planned discharges, and document relevant aspects of the discharge in accordance with the Environmental Compliance Manual described above in the Setting. If the superchlorinated water is not discharged to the sanitary sewer, it could be dechlorinated and transported to the EBMUD wastewater treatment plant or dechlorinated and discharged to the storm drain, or disposed of off-site in an approved manner.

The plan for each discharge would describe compliance with requirements of the local jurisdiction, as well as a sampling and analysis plan for determination of potential contaminants in groundwater to be discharged and chlorine levels in potable water discharges. The water would not be discharged until approval is obtained from the RWQCB and the agency having jurisdiction and the related documentation is provided to EBMUD.

Compliance with EBMUD construction specifications and Environmental Compliance Manual, including discharge in accordance with the requirements of the agency having jurisdiction over the discharge, would ensure that impacts associated with discharges of groundwater produced during dewatering and treated water from the pipelines are *less than significant*.

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**Impact 3.10-3: Alteration of drainage patterns and impedance or redirection of flood flows (Wildcat Pipeline [Berkeley] and Central Pressure Zone Pipeline [Richmond/San Pablo]).**

As discussed in the Setting section above, the Central Pressure Zone Pipeline (Richmond/San Pablo) crosses the 100-year flood zone identified by FEMA on both Wildcat and San Pablo Creeks. Near the pipeline crossing, the base flood elevation is 51 feet NAVD88 on Wildcat Creek and 49 feet NAVD88 on San Pablo Creek (FEMA, 2009a). In this area, flood flows are held back by culverts under the Union Pacific and Burlington Northern Santa Fe Railroads, approximately 0.5 mile to the west of crossing (FEMA, 2009b), resulting in broad areas of shallow flooding between the creeks and extending on either side of the creeks. Therefore, construction activities associated with the jack and bore crossing beneath Wildcat Creek and the pipeline bridge across San Pablo Creek could temporarily result in alteration of drainage patterns or impedance or redirection of flood flows. In addition, the pipe bridge across San Pablo Creek could impede flood flows or result in long-term erosion of the creek once constructed, unless appropriately designed.

Temporary alteration of drainage patterns or impedance or redirection of flood flows during construction activities associated with the jack and bore crossing beneath Wildcat Creek and the pipeline bridge across San Pablo Creek would be a potentially significant impact if flooding were to occur during construction at these locations. Implementation of Mitigation Measure HYD-1**,** Schedule Construction Activities at Harwood Creek, Wildcat Creek, and San Pablo Creek During the Dry Season, requiring the construction contractor to schedule construction activities at these locations during the dry season, would reduce this impact to *less than significant* by ensuring that construction activities would be conducted during the dry season when flooding would not occur.

The disturbed area for jack and bore construction beneath Wildcat Creek would be restored to existing conditions at the completion of construction and thus would not result in alteration of drainage patterns or redirection or impedance of flood flows. For the pipe bridge across San Pablo Creek, EBMUD would locate all bridge footings at an elevation of about 48 feet[5] at the 21st Street crossing where the base flood elevation of San Pablo Creek is 46 feet. If the alternative alignment is selected, the bridge footings would be placed at an elevation of 50 feet at the San Pablo Avenue crossing where the base flood elevation of San Pablo Creek is 49 feet. The bridge deck would be about 2 ½ feet above the bridge footing. These elevations are above the ordinary high water mark and the base elevation of the 100-year flood zone of San Pablo Creek. Further, the footings would be appropriately anchored as described in the Project Description, and the creek bed would not be filled or otherwise altered. With implementation of these measures as part of the Project, the pipe bridge would not interfere with flows in San Pablo Creek or act as a flood barrier that would increase flood heights or velocities or increase flood hazards in other areas. Therefore, long-term impacts associated with alterations in topography and impedance of flood flows that could result in erosion and sedimentation and flooding would be *less than significant*.

Although the Wildcat Pipeline (Berkeley) crosses a flood zone of Harwood Creek in Berkeley (FEMA, 2009c), construction activities at this location would not impede or redirect flood flows or alter drainage patterns because construction activities would be constructed entirely within streets, including Claremont Avenue and The Uplands.

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**Impact 3.10-4: Flooding resulting from a pipeline rupture (applies to all pipelines).**

In the event that one of the new pipelines constructed under the West of Hills Northern Pipelines Project ruptured, adjacent and downhill residences and structures could be flooded, resulting in water damage. However, as described in the Project Description, the pipelines would be designed with isolation valves that can be closed to interrupt the flow of water to a ruptured pipe. Further, as discussed in the Setting above, an EBMUD inspector would respond on-site within one hour in accordance with EBMUD's Leak Response Program. The inspector would be fully equipped and authorized to implement leak control BMPs immediately upon arrival, if safe to do so. Once immediate BMPs are implemented, the inspector would assign a leak repair priority based on factors such as safety, customer impacts, environmental impacts, property damage, discharge rate, and traffic impacts. With proper design of the pipelines, and implementation of EBMUD's Leak Response Program, the potential for pipeline rupture and associated flood damage is low. Therefore, this impact would be *less than significant.*

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5 All elevations presented in North American Vertical Datum of 1988.

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# 3.11 Noise

This technical report evaluates the potential noise and vibration impacts associated with constructing and operating the four proposed pipeline segments. It describes the existing noise environment, presents relevant noise regulations and standards, and identifies sensitive noise receptors that could be affected by the proposed Project. Potential noise and vibration impacts on these receptors are evaluated and discussed.

## 3.11.1 Setting

### Noise and Vibration Descriptors

The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound, and the decibel (dB) scale is used to quantify sound intensity. Because the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions in a process called "A-weighting," which is expressed as "dBA." The A-weighted decibel, dBA, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies. On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA. A 10-dBA increase in the level of a continuous noise represents a perceived doubling of loudness. The noise levels presented in this section are expressed in terms of dBA unless otherwise indicated. **Appendix I** presents some representative noise sources and their corresponding noise levels in dBA. In addition, noise energy levels (i.e. Leq, CNEL, Ldn, Lmax) are expressed in terms of noise exposure and their definitions are included in Appendix I.

Vibrations caused by construction activities can be interpreted as energy transmitted in waves through the ground. These energy waves generally dissipate with distance from the vibration source (e.g., pile driving or sheetpile driving). Vibration is an oscillatory motion that can be described in terms of displacement, velocity, or acceleration. Peak particle velocity (PPV) is defined as the maximum instantaneous positive or negative peak of the vibration signal. PPV is used to assess the potential for damage to buildings and structures and is expressed in inches per second (in/sec).Some reference values for vibration are as follows: (1) a freight train passing at a distance of 100 feet can result in vibrations of 0.1 in/sec PPV, and (2) a strong earthquake can produce vibrations in the range of 10 in/sec PPV.

### Existing Noise Environment

The Project's four pipeline segments would be constructed within streets with a wide range of existing noise environments:

- Two-lane residential streets carrying very low levels of traffic (i.e., Hillegass, Benvenue, and Dana Avenues, Stuart and Woolsey Streets, and The Uplands in Berkeley)
- Two-lane residential streets carrying higher levels (i.e., Hill Street, Richmond Avenue, Lincoln Avenue, Norvell Street, Fairmount Avenue, C Street, Ashbury Avenue, and Lynn Avenue in El Cerrito; Brookside Drive and Road 20 in San Pablo)

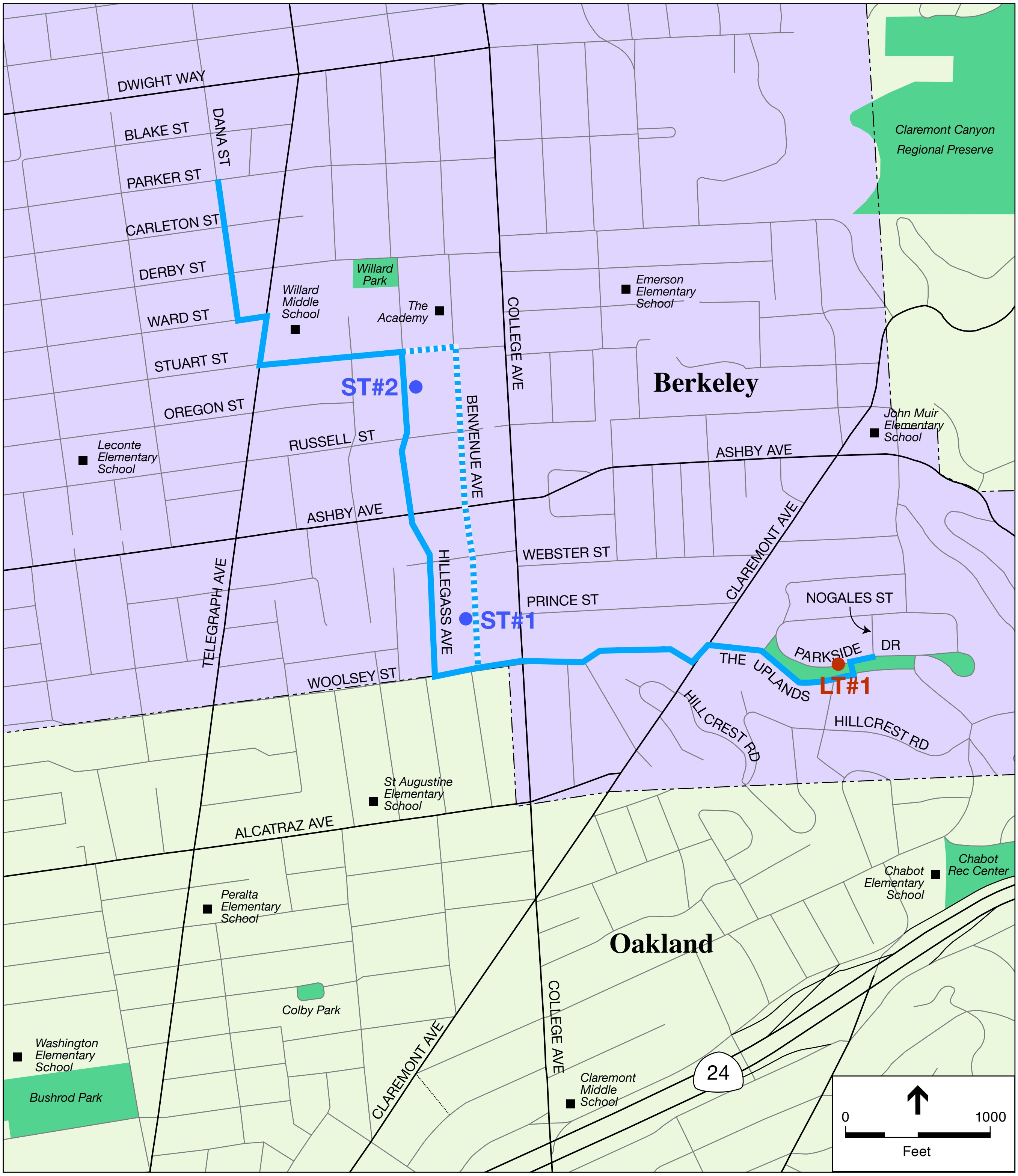
- 23rd Street, an arterial with four lanes in Richmond and two lanes in San Pablo that carries even higher levels of traffic and serves both commercial and residential uses
- San Pablo Avenue (Highway 123) in El Cerrito and Richmond, a four-lane arterial with a center median, which carries the highest levels of traffic

The existing noise environments of the project areas are typical of urban residential neighborhoods and commercial areas.

## Existing Noise Levels

In order to characterize the existing noise environment in the site vicinity, short-term (15-minute) and long-term (24-hour) noise measurements were taken in March 2012 at nine locations in the four project areas (see **Figures 3.11-1** through **3.11-3**). **Table 3.11-1** summarizes the results of these measurements, and noise measurements by pipeline segment are described as follows:

- **Wildcat Pipeline (Berkeley).** This pipeline alignment (and alternative alignment) extends almost entirely along residential streets. This area is located as close as 0.33 mile north of the Interstate 580 (I-580) freeway, but an intervening hill separates the area from the freeway. Noise levels along Parkside Street (Location LT (long-term)#1) were measured at 56 dBA (CNEL), while daytime noise levels along other residential streets in the area (Benvenue Avenue and Hillegass Street, Locations ST (short-term)#1 and ST #2) ranged from 49 to 52 dBA(Leq).
- **Wildcat Pipeline (El Cerrito).** This pipeline alignment extends entirely along residential streets. However, some of these streets carry higher traffic volumes than others, depending on the traffic level: the measured daytime noise level for Lynn Avenue, Location ST #3 was 56 dBA (Leq), and for Richmond Street, Location ST #5 was 61 dBA (Leq). Residential areas near the El Cerrito BART station, San Pablo Avenue, and the freeway (Hill Street, Location LT #2) had relatively higher noise levels (63 dBA, CNEL) when compared with other residential areas in the project area. The closest major roadways to this area – the I-80 freeway and San Pablo Avenue – are about 0.33 mile and 0.24 mile west of Richmond Street, respectively.
- **Central Pressure Zone Pipeline (El Cerrito/Richmond).** This pipeline alignment extends along San Pablo Avenue (Highway 123), which has the highest traffic volumes and associated traffic noise levels of the four alignments. There are commercial and multifamily residential uses adjacent to this section of San Pablo Avenue, but commercial uses are the predominant land use. The daytime noise level was measured at 67 dBA (Leq) on San Pablo Avenue, Location ST #4. In the El Cerrito area, the I-80 freeway, San Pablo Avenue, and BART facilities are roughly parallel and within 0.5 miles of each other, such that areas in the vicinity of San Pablo Avenue are also subject to noise from I-80 and BART.
- **Central Pressure Zone Pipeline (Richmond/San Pablo).** This pipeline alignment extends mostly along 23rdStreet. In Richmond, this street is lined with commercial uses, and Richmond High School is located north of Maricopa Avenue. The daytime noise level in the vicinity of this school (23rd Street, Location ST #6) was measured at 56 dBA (Leq). North of the high school, this alignment continues on 23rd Street, crossing into San Pablo where residential uses predominate. At the north end, this alignment is located in or adjacent to residential streets and Kennedy Plaza (Road 20, Location LT #3), where noise levels were measured at 62 dBA (CNEL). This neighborhood is bounded by San Pablo Avenue to the east and Rumrill Boulevard to the north and west (located 1,000 and 1,200 feet from the measurement location, respectively). The closest major roadway to this area is the I-80 freeway, which is about 1 mile east of 23rd Street in Richmond.

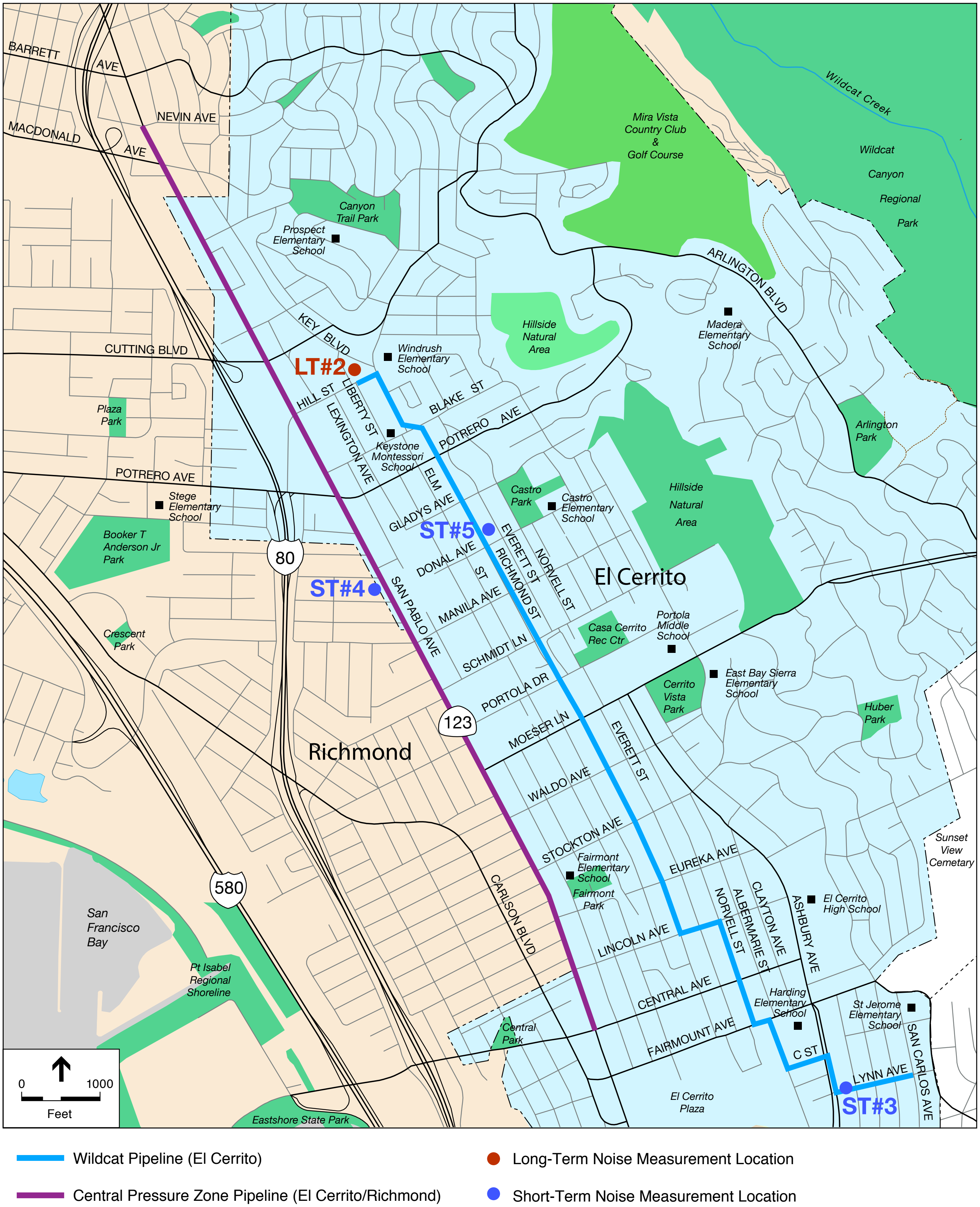



Wildcat Pipeline (Berkeley)
Alternative Alignment (Benvenue Ave)
Long-Term Noise Measurement Location
Short-Term Noise Measurement Location

SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

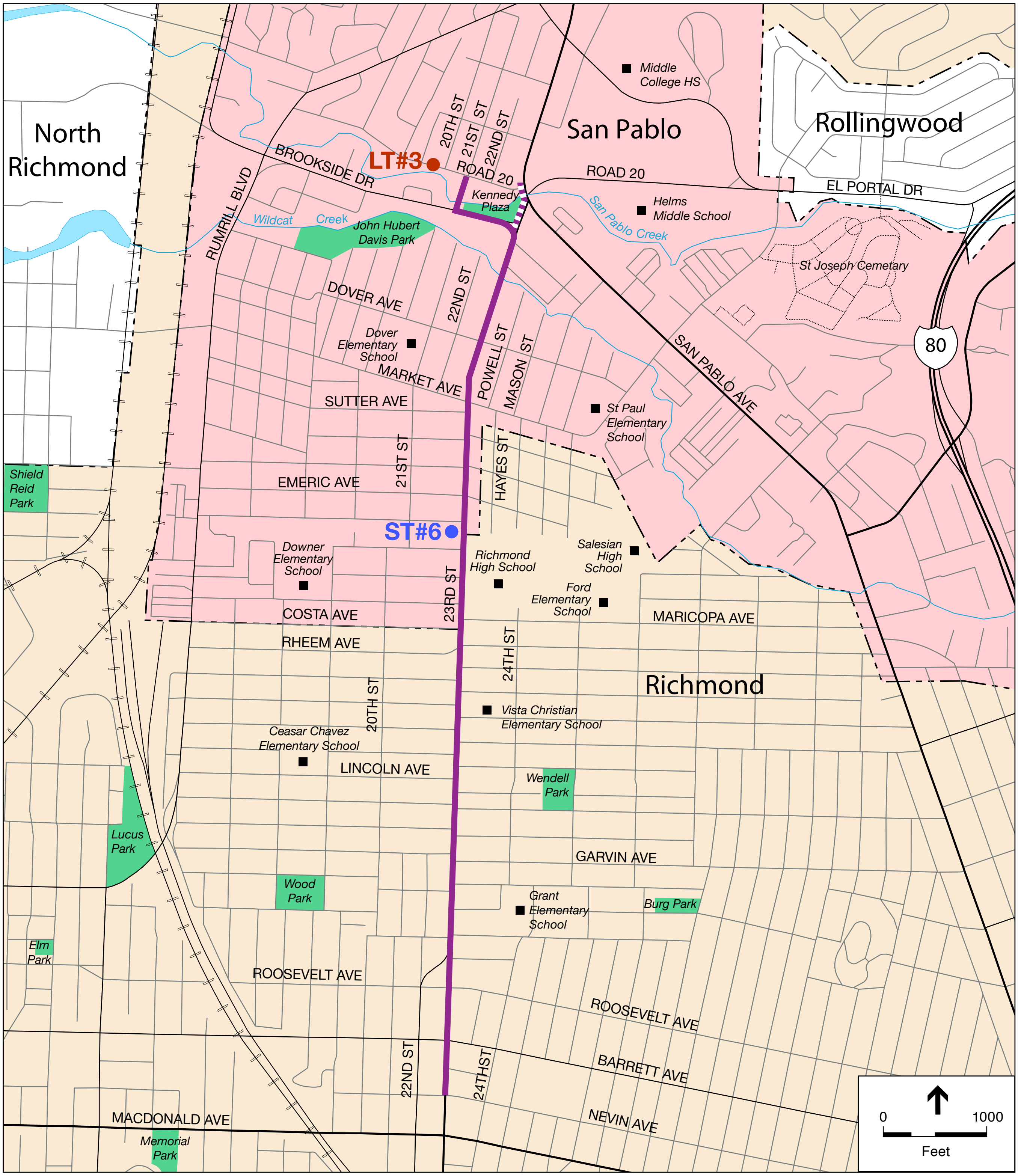
**Figure 3.11-1**
Noise Measurement Locations for Wildcat Pipeline (Berkeley)




SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure 3.11-2**
Noise Measurement Locations for Wildcat Pipeline (El Cerrito) and Central Pressure Zone Pipeline (El Cerrito and Richmond)




Central Pressure Zone Pipeline (Richmond/San Pablo)
Alternative Alignment
Long-Term Noise Measurement Location
Short-Term Noise Measurement Location

SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure 3.11-3**
Noise Measurement Locations for Central Pressure Zone Pipeline (Richmond /San Pablo)

**TABLE 3.11-1**
**SUMMARY OF LONG-TERM NOISE MEASUREMENT RESULTS**

| Measurement Location | Date and Start Time | Measured Noise Level (Leq) |
|---|---|---|
| LT #1: Parkside Street at Nogales Street, Berkeley (20 feet from centerline) | March 22, 2012 at noon to March 23, 2012 at noon | Day: 56.0 (7 a.m. to 7 p.m.)<br>Evening: 52.1 (7 p.m. to 10 p.m.)<br>Night: 45.6 (10 p.m. to 7 a.m.)<br>CNEL[a]: 56 |
| LT #2: Hill Street at Liberty Street, El Cerrito (30 feet from centerline) | March 29, 2012 at noon to March 30, 2012 at noon | Day: 61.1 (7 a.m. to 7 p.m.)<br>Evening: 60.0 (7 p.m. to 10 p.m.)<br>Night: 54.2 (10 p.m. to 7 a.m.)<br>CNEL[a]: 63 |
| LT #3: Road 20 at 20th Street, San Pablo (20 feet from centerline) | March 22, 2012 at noon to March 23, 2012 at noon | Day: 58.8 (7 a.m. to 7 p.m.)<br>Evening: 57.1 (7 p.m. to 10 p.m.)<br>Night: 54.0 (10 p.m. to 7 a.m.)<br>CNEL[a]: 62 |
| ST #1: 3040 Benvenue Avenue, Berkeley (18 feet from centerline) | March 26, 2012 at 1:30 p.m. | 48.7 |
| ST #2: 2821 Hillegass Street, Berkeley (18 feet from centerline) | March 26, 2012 at 12:55 p.m. | 52.2 |
| ST #3: Lynn Avenue at Pomona Avenue, El Cerrito (13 feet from centerline) | March 22, 2012 at 4:45 p.m. | 56.1 |
| ST #4: 11025 San Pablo Avenue, El Cerrito (65 feet west of centerline) | March 22, 2012 at 4:15 p.m. | 67.0 |
| ST #5: 1400 Richmond Street, El Cerrito (55 feet east of centerline) | March 22, 2012 at 3:50 p.m. | 60.6 |
| ST #6: 1321 23rd Street, Richmond (85 feet west of centerline) | March 21, 2012 at 2:35 p.m. | 56.3 |

NOTE: Measurements LT #1 and LT #3 were taken from noon on Thursday, March 22, 2012, to noon on Friday, March 23, 2012, using a Metrosonics db-308 sound level meter and a Quest Soundpro D/L meter. Measurement LT #2 was taken from noon on Thursday, March 29, 2012, to noon on Friday, March 29, 2012. Each short-term (ST) measurement was taken for 15 minutes using a Quest Soundpro D/L meter.

[a] CNEL is a 24-hour noise level with 10-dBA penalty between 10:00 p.m. and 7 a.m., and a 5-dBA penalty between 7 p.m. and 10:00 p.m.

SOURCE: Orion Environmental Associates.

## Sensitive Receptors

Human response to noise varies considerably from one individual to another. The effects of noise can include interference with sleep, concentration, and communication; physiological and psychological stress; and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hospitals, and nursing homes are considered to be the most sensitive to noise. **Table 3.11-2** identifies sensitive receptors located adjacent to or near the Project pipeline alignments.

**TABLE 3.11-2**
**SENSITIVE RECEPTORS NEAR THE PIPELINE ALIGNMENTS**

| Facility | Location | Distance from Alignment |
|---|---|---|
| Wildcat Pipeline (Berkeley) | | |
| Residential Uses | Entire Alignment Except Telegraph Ave. | Adjacent |
| Willard Middle School | 2425 Stuart Street | Adjacent |
| The Academy | 2722 Benvenue Avenue | 275 feet |
| Alta Bates Hospital | 2450 Ashby Avenue | 500 feet |
| Wildcat Pipeline (El Cerrito) | | |
| Residential Uses | Entire Alignment | Adjacent |
| Windrush Elementary | 1800 Elm Street | Adjacent |
| RN3 Loving Care Homes | 917 Elm Street | 275 feet |
| Harding Elementary School | 7230 Fairmount Avenue | 200 feet |
| St. Jerome Elementary School | 320 San Carlos Avenue | >500 feet |
| El Cerrito High School | 540 Ashbury Avenue | >500 feet |
| Fairmont Elementary School | 724 Kearney Street | >500 feet |
| Portola Middle School | 1021 Navellier Street | > 500 feet |
| Castro Elementary School | 7125 Donal Avenue | > 500 feet |
| Central Pressure Zone Pipeline (El Cerrito/Richmond) | | |
| Residential Uses (Scattered Residences and Various Residential Developments Including Eskaton Hazel Shirley Manor) | Generally North of Potrero Avenue, at or South of Lincoln Avenue, and Between Madison and Burlingame Aves. | Adjacent |
| St. John the Baptist School | 11156 San Pablo Avenue | Adjacent |
| Fairmont Elementary School | 724 Kearney Street | 300 feet |
| Central Pressure Zone Pipeline (Richmond/San Pablo) | | |
| Residential Uses | Generally North of Costa Avenue | Adjacent |
| Richmond High School | 1250 23rd Street | Adjacent |
| Grant Elementary School | 2400 Downer Avenue | 220 feet |
| Vista Christian Elementary School | 2354 Andrade Avenue | 300 feet |
| Dover Elementary School | 1871 21st Street | >500 feet |
| St. Paul Elementary School | 1825 Church Lane | >500 feet |
| Ford Elementary School | 2711 Maricopa Avenue | >500 feet |
| Salesian High School | 2851 Salesian Avenue | >500 feet |
| Cesar Chavez Elementary School | 960 17th Street | >500 feet |

NOTE: Daycare and pre-school facilities are considered in this analysis to be subject to noise impacts similar to residential uses.

SOURCE: Orion Environmental Associates.

# 3.11.2 Regulatory Setting

## Federal and State Regulations

No federal or state standards related to noise are applicable to the proposed Project. The Federal Noise Control Act of 1972 divides powers between federal, state, and local governments, in which the primary federal responsibility is for noise source emission control. State and local governments are responsible for controlling the use of noise sources and determining the levels of noise to be permitted in their environment (USEPA, 1974).

## Local Regulations and Policies

At the local level, noise is addressed through the implementation of general plan policies, including noise and land use compatibility guidelines, and through enforcement of noise ordinances. General plan policies provide guidelines for determining whether a noise environment is appropriate for a proposed or planned land use. Local noise ordinances regulate such sources as mechanical equipment and amplified sounds, as well as prescribe hours of heavy equipment operation. Pursuant to California Government Code Section 53091, EBMUD, as a local agency and utility district serving a broad regional area is not subject to building and land use zoning ordinances (such as noise ordinances) for projects involving facilities that would produce, generate, store, or transmit water. However, it is the practice of EBMUD to work with local jurisdictions and neighboring communities during project planning, and to conform to local environmental protection policies to the extent feasible.

Project pipeline segments traverse four cities: Berkeley, El Cerrito, Richmond, and San Pablo. **Table 3.11-3** summarizes the pertinent construction noise ordinance time and noise limits for each city.

# 3.11.3 Impacts and Mitigation Measures

## Significance Criteria

This section addresses the following standards of significance provided in Appendix G of the CEQA Guidelines. Would the project:

1. Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies

2. Expose persons to or generate excessive groundborne vibration or groundborne noise levels

3. Cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project

4. Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project

**TABLE 3.11-3**
**SUMMARY OF NOISE ORDINANCE TIME AND NOISE LIMITS**

| Jurisdiction | Construction Time Limits | | Construction Noise Limits |
|---|---|---|---|
| | Weekdays | Weekends | |
| City of Berkeley[a] | 7 a.m. to 7 p.m. | 8:30 a.m. to 6 p.m. | *At R-1, R-2 Residential Zones*<br>Mobile (non-scheduled, intermittent, operating for <10 days): 75 dBA on weekdays and 60 dBA on weekends and legal holidays<br>Stationary (repetitively scheduled, long-term, operating for >10 days): 60 dBA on weekdays and 50 dBA on weekends and legal holidays |
| City of El Cerrito[b] | 8 a.m. to 5 p.m. or as specified in encroachment permit conditions | None Specified | None Specified |
| City of Richmond[c] | 7 a.m. to 7 p.m. | 9 a.m. to 8 p.m. | *In Commercial Zoning Districts*<br>Mobile (non-scheduled, intermittent, short-term, operating for <15 days): 75 dBA on weekdays and 60 dBA on weekends and legal holidays<br>Stationary: 60 dBA on weekdays and 55 dBA on weekends and legal holidays |
| City of San Pablo[d] | 7 a.m. to 9 p.m. | 9 a.m. to 5 p.m. | None (however, outside of these hours, pile drivers, steam shovels, pneumatic hammers, derricks, steam or electric hoists, power-driven saws, or any other tool or apparatus is prohibited, except with written permission from the building inspector or in case of emergency). |

[a] Time and noise limits for temporary construction activity specified in Section 13.40.070.B.7 of the Berkeley Municipal Code.
[b] Per standard encroachment permit conditions. Encroachment permits required by Section 13.12.010 of the El Cerrito Municipal Code.
[c] Time and noise limits for temporary construction activity specified in Section 9.52.110 of the Richmond Municipal Code.
[d] Time limits and equipment restrictions specified in Section 9.12.010 of the San Pablo Municipal Code.

SOURCE: Orion Environmental Associates.

5. For a project located within an airport land use plan, or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels

6. For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels

Significance Criteria #5 and 6 related to airport operations are not applicable to the proposed Project; there are no public airports or private airstrips in the project vicinity, and the project area is not located in an area covered by an airport land use plan.

## *Significance Thresholds Used in this Analysis*

### Noise Thresholds

**Local Noise Standards.** Table 3.11-3 lists the noise regulations and standards that pertain to construction activities. The time and noise limits specified in these ordinances were applied in this analysis as thresholds to determine the Project's construction-related and operational noise impacts under the Significance Criteria #1 and 3 listed above (see Impact 3.11-1).

**Noise Disturbance Thresholds.** For construction noise, a "substantial" noise increase (as referenced under Significance Criterion #4 listed above) is defined in this analysis as speech interference during the day and sleep disturbance during the night.

- ***Speech Interference.*** Speech interference is an indicator of the effects of noise on typical daytime and evening activities. A speech interference threshold, in the context of impact duration and time of day, is used to identify substantial increases in noise resulting from temporary construction activities. For indoor noise environments, the highest noise level that permits relaxed conversation with 100 percent intelligibility throughout the room is 45 dBA. Speech interference is considered to be intolerable when normal conversation is precluded at 3 feet, which occurs when background noise levels exceed 60 dBA. Since a typical building can reduce noise levels by 25 dBA (with closed windows), an exterior noise level of 70 dBA at receptor locations would maintain an acceptable interior noise environment of 45 dBA. In some cases, this noise reduction could be maintained only on a temporary basis, since it assumes windows must remain closed at all times. It should be noted that such construction noise levels would be sporadic rather than continuous in nature, because different types of construction equipment would be used throughout the construction process.

  For this analysis, a significant noise impact would occur if noise levels remained above the 70-dBAspeech interference threshold for longer than 2 weeks (10 consecutive work days). However, activities at schools could be disrupted if speech interference effects occurred for even a day or two. Therefore, impacts on schools are considered significant if speech interference occurs for any duration.

- ***Sleep Disturbance.*** Based on available sleep criteria data, an interior nighttime level of 35 dBA is considered acceptable (USEPA, 1974). Assuming a 25-dBA reduction with the windows closed, an exterior noise level of 60 dBA at receptors[1] would maintain an acceptable interior noise environment of 35 dBA.

Project-related construction activities would result in temporary noise increases at adjacent or nearby sensitive receptors. Construction noise levels would vary at any given receptor depending on the construction phase, equipment type, duration of use, distance between the noise source and receptor, and the presence or absence of barriers between the noise source and receptor. For this analysis, construction noise levels were first estimated for proposed daytime construction and nighttime construction activities and then compared with the speech interference or sleep disturbance thresholds, as appropriate. For daytime construction noise, the duration of exposure at any given receptor was considered in determining the impact's significance. Temporary exposure to construction noise during the daytime at levels above the 70-dBA speech interference threshold for 2 weeks or less is considered to be a less-than-significant impact. However, for nighttime construction, noise levels above the 60-dBA sleep disturbance threshold for even one night is considered to be a significant impact.

1 Receptors are locations where noise is modeled and/or measured. Noise receptors are defined as places where people are typically located, such as residences, hotels, commercial buildings, parks, etc.

### Vibration Thresholds

The vibration thresholds used in this analysis are based on cosmetic damage to buildings and are shown in **Table 3.11-4**. Higher vibration levels have the potential to cause cosmetic damage to buildings, as discussed further below. Lower vibration levels have the potential to cause disturbance to residents; however, the potential to result in disturbance is not used as a threshold. Construction-related noise and vibration typically occur from the same activities, but vibration impacts are attenuated in a shorter distance. For instance, noise from heavy equipment would exceed the 60 dBA sleep disturbance to a distance of approximately 200 to 350 feet, while vibration would dissipate to levels that would not cause disturbance at a much shorter distance (approximately 70 to 80 feet). The distance that vibration would dissipate to below disturbance levels depends on a combination of factors including soil type, duration, time of day, and the number of perceived events. While noise-related source and administrative control measures could also reduce the potential for disturbance from vibration to a less-than-significant level, they would not prevent potential impacts associated with cosmetic and structural damage to buildings. Therefore, the thresholds to limit excessive groundbourne vibration levels used in this analysis are based on preventing cosmetic and structural damage to structures.

**TABLE 3.11-4**
**VIBRATION THRESHOLDS**

| Category | Maximum Amplitude |
|---|---|
| Cosmetic Damage – Residential and Commercial Buildings | |
| Transient or Intermittent Sources | 0.5 in/sec PPV[a] |
| Continuous Vibratory Sources | 0.4 in/sec PPV[a] |
| All Vibratory Sources Located in Areas of Very High Liquefaction Susceptibility, as Depicted in Figure 3.7-4 | 0.1 g (peak acceleration), or 0.2 in/sec PPV at 30 Hz[b] |

NOTES:
Transient: Typically less than 20 seconds in duration per occurrence, and occurring infrequently such as a loaded truck passing a receptor.
Intermittent: Typically 20 seconds or less in duration per occurrence, and occurring several times per hour on a regular basis such as impact pile driving.
Continuous: Applied to vibratory methods such as a vibratory compactor or vibratory pile driver.

SOURCES:
[a] Caltrans, 2004; AASHTO, 2004.
[b] USGS, 2006. The estimated peak ground acceleration (PGA) threshold in areas with High to Very High liquefaction susceptibility is as follows: 0.1 g for areas mapped as "Qhc," "Qhly," and "Qhty," and >0.2 g for "Qhf." Vibratory construction equipment typically generates vibration near 30 Hz (1,800 rpm) or lower; thus, the corresponding peak vibration velocity thresholds for this effect are 0.205 in/sec PPV for 0.1 g PGA and 0.410 in/sec PPV for 0.2 g PGA.

**Cosmetic Damage to Buildings from Transient and Intermittent Sources.** The American Association of State Highway and Transportation Officials (AASHTO) Standard R 8-96 (AASHTO, 2004) describes three general categories of damage to buildings from vibration: (1) threshold cracking; (2) architectural or minor damage; and (3) major damage. Both threshold and minor damage include cracks in room interior surfaces that do not affect the strength or structural integrity of the structure. The term "threshold cracking" is defined as the highest vibration amplitude at which no cosmetic, minor, or major damage would occur; this may include "threshold cracks" (i.e., hairline cracks in room walls that occur at the lowest vibration amplitudes). Based on the AASHTO guidelines, a threshold damage criterion of 0.5 in/sec PPV is appropriate to evaluate vibration impacts caused by transient and intermittent sources. Therefore, this criterion was applied in this analysis to evaluate transient vibration.

**Cosmetic Damage to Buildings from Continuous Vibratory Sources.** The AASHTO guidelines also include a discussion regarding the potential fatigue and damage caused by sources of continuous vibration, such as vibratory compactors and vibratory pile drivers. During project construction, vibratory pile drivers could be operated at frequencies near “building resonance” (10 to 50 Hertz [Hz]), thus increasing the potential for cosmetic damage. The guidelines indicate that limiting such vibration to 0.4 in/sec PPV can avoid threshold damage. Therefore, this criterion was applied in this analysis to evaluate continuous vibration.

**Cosmetic Damage to Buildings in Areas of Liquefaction Susceptibility.** Depending on the local geologic conditions, vibratory pile driving or similar vibration sources (i.e. vibratory compactors) can cause liquefaction (or differential settlement in sandy soils) as a result of the continuous nature of the vibration. AASHTO (2004) states, “Saturated, loose, uniformly or poorly graded sands and silts are sensitive to cyclic vibration such as might be produced by vibratory pile driving. These activities can produce noticeable settlement even at low vibration levels (0.1 to 0.7 in/sec).”

Figure 3.7-4 (presents the liquefaction susceptibility mapping performed by the U.S. Geological Survey (USGS) in 2006. The USGS maps indicate that the northern portion of the Central Pressure Zone Pipeline (Richmond/San Pablo) would be located in areas mapped as having High to Very High susceptibility. A small area of artificial fill near the Pacific East Mall (3288 Pierce Street) would have a Very High susceptibility; this area is located approximately 1,400 feet southwest of the southernmost terminus of the Central Pressure Zone Pipeline (El Cerrito/Richmond).

The USGS has provided information regarding the liquefaction susceptibility of soils, indicating that vibration on the order of 0.1 gravity (g) peak ground acceleration[2] could cause liquefaction of soils with a Very High susceptibility, and vibration between 0.1 g and 0.2 g could cause liquefaction in areas with a High susceptibility (USGS, 2006).

Most construction activity generates vibration in the 10 to 40 Hz frequency range. With 0.1 g peak acceleration, this converts to a vibration velocity of 0.614 in/sec PPV at 10 Hz, and 0.154 in/sec PPV at 40 Hz. However, the highest-risk activity for liquefaction or differential settlement is vibratory sheet pile driving, which typically generates continuous vibration in the 3 to 30 Hz range. A limit of 0.1 g would thus correspond to a threshold of 2.0 in/sec PPV at 3 Hz, down to 0.205 in/sec PPV at 30 Hz; and a 0.2 g limit corresponds to 0.410 at 40 Hz. Thus, where vibratory sheet pile driving is proposed in areas categorized as having a Very High susceptibility to liquefaction, this analysis applies 0.1 g (0.2 in/sec PPV at 30 Hz) as the significance threshold.

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2 Peak ground acceleration, or PGA, is a measure of ground motion intensity expressed in units of gravitational force (g).

## Approach to Analysis

### *Methodology*

Project implementation would result in temporary increases in construction noise in the vicinity of the pipeline alignments, as well as occasional noise increases during maintenance of the pipelines. The noise impact assessment evaluates short-term (temporary) impacts associated with the construction of the pipeline segments. Potential impacts were assessed by considering several factors, including the proximity of Project-related noise sources to sensitive receptors; typical noise levels associated with construction equipment; the potential for construction noise levels to interfere with daytime and nighttime activities (e.g., speech interference, sleep disturbance); the duration that sensitive receptors would be affected; and whether proposed activities would occur outside the construction time limits specified in local ordinances or would exceed local ordinance noise limits. Ambient noise levels in the project vicinity were considered when determining appropriate performance standards for mitigation measures.

The operation of impact or vibratory equipment (i.e. vibratory sheetpile drivers or vibratory compactors) as part of project construction could result in vibration that, in turn, could cause cosmetic damage to buildings or structures or disturb nearby residents at night. The impact assessment for vibration evaluates the potential for construction to result in excessive groundborne vibration or groundborne noise. Groundborne noise is experienced inside a building or structure but is the result of vibrations produced outside of the building and transmitted as ground vibration between the source and receiver. Groundborne noise can be problematic in situations where the primary airborne noise path is blocked, as in the case of a subway tunnel passing near homes or other noise-sensitive structures. However, the proposed noise- and vibration-generating construction activities associated with the Project would involve techniques (i.e. pavement cutting, excavation, sheetpile driving, jack and bore, and paving) that generate airborne noise and surface vibration. Any potential groundborne noise from construction activities would be imperceptible; therefore, no impact related to groundborne noise would occur, and this topic is not discussed further. The analysis of groundborne vibration impacts uses standard analytical methodologies, such as estimating vibration levels at sensitive receptors for a given vibration source and setback distance, comparing the estimated vibration levels with recommended limits or significance thresholds, determining potentially significant impacts on nearby sensitive receptors, and providing mitigation where applicable.

For operational noise, impacts were assessed by evaluating the noise-generation potential of Project facilities, determining the proximity of facilities to sensitive receptors, and comparing operational noise levels with noise ordinance limits at the nearest receptors.

#### Construction Hours

**General Construction Hours.** Construction activities would typically occur during the daytime hours (8:00 a.m. to 7:00 p.m.) on weekdays. These proposed hours would generally be consistent with the construction time limits specified in the noise ordinances of the four jurisdictions where project construction would occur (see Noise Regulations and Policies in Section 3.11.2).

**Construction Hours for Tie-ins**. Connecting the ends of the new pipelines to the existing pipeline network would involve continuous operation of a hot-tap machine for at least 5 to 7 hours to cut into the wall of the existing pipe. Once the hop-tap machine starts cutting into the pipe wall, it must continue until the connection is completed, so it is assumed that the tie-ins would require one 24-hour construction period to accomplish. Pressure testing and disinfecting the new pipeline would use millions of gallons of water, which would need to be discharged into a sanitary sewer or storm drain. The dewatering pumps would operate continuously (24 hours per day, 7 days per week) for up to 1 month.

**Construction Hours for Nighttime Intersection Work**. Construction of the pipelines could occur during the night at traffic intersections when required by encroachment permit conditions to minimize traffic impacts. If required, it is expected that nighttime intersection work would only occur at arterial streets such as San Pablo Avenue in El Cerrito and Richmond, and Ashby Avenue in Berkeley.

## Impacts and Mitigation Measures

**Impact 3.11-1: Construction activities could expose people to noise during time periods that fall outside of ordinance time limits or to noise levels that exceed ordinance limits (applies to all pipelines).**

Project construction has the potential to expose people to noise exceeding the local noise ordinance time and noise limits summarized in Table 3.11-3 above. As described above under Construction Hours, construction activities could expose people to noise outside of the time limits specified in local noise ordinances and to noise levels that exceed ordinance noise limits (which were applied to construction noise occurring beyond ordinance time limits).

**Table 3.11-5** presents the estimated Project-related ***daytime*** construction noise levels along the pipeline alignments at the closest sensitive receptors based on distance, equipment type and duration of equipment use. The table is organized by construction activity and equipment associated with each activity (i.e., Principal Noise Sources). The table indicates maximum noise levels (Lmax) ranging from 45 to 101 dBA at 50 feet for the equipment expected to be used during construction and the Noise Level Adjusted for Distance and Usage which takes into account distance from the closest sensitive receptor and the estimated duration of equipment operation. This adjusted Leq noise level was then compared to the ordinance daytime noise limits (for Impact 3.11-1), as well as the daytime speech interference threshold and associated 2-week construction duration threshold (for Impact 3.11-2). The table provides significance determinations for each pipeline alignment according to the principal noise-generating construction activities (“Impact 3.11-1 Significance Determination” and “Impact 3.11-2 Significance Determination”). The columns farthest to the right indicate the noise reduction associated with implementation of mitigation measures, and the adjusted Leq (“Mitigated Leq with Controls”). Refer to the notes presented at the bottom of Table 3.11-5 for additional details.

## TABLE 3.11-5
## ESTIMATED DAYTIME CONSTRUCTION NOISE LEVELS

| Pipeline and Closest Noise-Sensitive Receptor Location | Construction Activity | Principal Noise Sources | Reference Noise Level, Lmax in dBA at 50 feet[a] | Leq Noise Level Adjusted for Distance and Usage | Impact 3.11-1: Leq Exceeds 75-dBA Ordinance Daytime Noise Limit? | Impact 3.11-1: Impact 3.11-1 Significance Determination | Impact 3.11-2: Leq Exceeds 70-dBA Speech Interference Threshold? | Impact 3.11-2: Duration of Construction[b] (Workdays) | Impact 3.11-2: Impact 3.11-2 Significance Determination | Noise Reduction From Mitigation Measure NOI-1 and NOI-2b | Mitigated $L_{eq}$ With Mitigation Measure NOI-1 and NOI-2b |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Open Trench Pipeline Construction*** | | | | | | | | | | | |
| *Wildcat Pipeline (Berkeley)* | | *Berkeley Ordinance Noise Limit for Short-term Construction Activities:* | | | *75 dBA* | | | | | | |
| Closest residential | Pavement Cutting | Pavement Saw | 90 | 84 | Yes | **SU** | Yes | 1 Day | LS | 0 | **84** |
| receptors on: Parkside, | | Jackhammer | 89 | 83 | Yes | **SU** | Yes | 1 Day | LS | -5 | **78** |
| The Uplands, Hillegass | Excavation and | Excavator | 81 | 81 | Yes | **SU** | Yes | 3 Days | LS | 0 | **81** |
| or Benvenue, | Pipe Installation | Various Trucks (dump, flatbed, water) | 76 | 76 | Yes | **SU** | Yes | 3 Days | LS | 0 | **76** |
| Stuart, Telegraph, | | Backhoe, Loader, Forklift | 79 | 79 | Yes | **SU** | Yes | 3 Days | LS | 0 | **79** |
| Ward, Dana | | Mobile Batch Plant[f] | 76 | 72 | No | LS | Yes | 2 Days | LS | 0 | 72 |
| | Repaving | Paving Equipment (roller) | 80 | 74 | No | LS | Yes | 2 Days | LS | 0 | 74 |
| | | Compactor | 83 | 77 | Yes | **SU** | Yes | 2 Days | LS | 0 | **77** |
| | | | | 89 | Total Construction Days at One Receptor: | | | 6 Days | | | |
| *Wildcat Pipeline (El Cerrito)* | | *El Cerrito Ordinance Noise Limit for Short-term Construction Activities:* | | | *None* | | | | | | |
| Closest residential | Pavement Cutting | Pavement Saw | 90 | 86 | - | - | Yes | 1 Day | LS | 0 | 86 |
| receptors on: Lynn, | | Jackhammer | 89 | 85 | - | - | Yes | 1 Day | LS | -5 | 80 |
| C Street, Behrens, | Excavation and | Excavator | 81 | 83 | - | - | Yes | 3 Days | LS | 0 | 83 |
| Fairmount, Norvell | Pipe Installation | Various Trucks (dump, flatbed, water) | 76 | 78 | - | - | Yes | 3 Days | LS | 0 | 78 |
| Lincoln, Richmond, | | Backhoe, Loader, Forklift | 79 | 81 | - | - | Yes | 3 Days | LS | 0 | 81 |
| Hill | | Mobile Batch Plant[f] | 76 | 74 | - | - | Yes | 2 Days | LS | 0 | 74 |
| | Repaving | Paving Equipment (roller) | 80 | 76 | - | - | Yes | 2 Days | LS | 0 | 76 |
| | | Compactor | 83 | 79 | - | - | Yes | 2 Days | LS | 0 | 79 |
| | | | | 91 | Total Construction Days at One Receptor: | | | 6 Days | | | |
| *Central Pressure Zone Pipeline (El Cerrito/Richmond)* | | *El Cerrito Ordinance Noise Limit for Short-term Construction Activities:* | | | *None* | | | | | | |
| Closest residential | Pavement Cutting | Pavement Saw | 90 | 84 | - | - | Yes | 1 Day | LS | 0 | 84 |
| receptors on San | | Jackhammer | 89 | 83 | - | - | Yes | 1 Day | LS | -5 | 78 |
| Pablo Avenue | Excavation and | Excavator | 81 | 81 | - | - | Yes | 3 Days | LS | 0 | 81 |
| (Highway 123) | Pipe Installation | Various Trucks (dump, flatbed, water) | 76 | 76 | - | - | Yes | 3 Days | LS | 0 | 76 |
| | | Backhoe, Loader, Forklift | 79 | 79 | - | - | Yes | 3 Days | LS | 0 | 79 |
| | | Mobile Batch Plant[f] | 76 | 72 | - | - | Yes | 2 Days | LS | 0 | 72 |
| | Repaving | Paving Equipment (roller) | 80 | 74 | - | - | Yes | 2 Days | LS | 0 | 74 |
| | | Compactor | 83 | 77 | - | - | Yes | 2 Days | LS | 0 | 77 |
| | | | | 89 | Total Construction Days at One Receptor: | | | 6 Days | | | |
| *Central Pressure Zone Pipeline (Richmond/San Pablo)* | | *Richmond Ordinance Noise Limit for Short-term Construction Activities:* | | | *75 dBA* | | | | | | |
| Closest school | Pavement Cutting | Pavement Saw | 90 | 79 | Yes | **SU** | Yes | 1 Day | LS | 0 | **79** |
| receptor (Richmond | | Jackhammer | 89 | 78 | Yes | **SM** | Yes | 1 Day | LS | -5 | 73 |
| High School) | Excavation and | Excavator | 81 | 76 | Yes | **SU** | Yes | 3 Days | LS | 0 | **76** |
| on 23rd Street | Pipe Installation | Various Trucks (dump, flatbed, water) | 76 | 71 | No | LS | Yes | 3 Days | LS | 0 | 71 |
| | | Backhoe, Loader, Forklift | 79 | 74 | No | LS | Yes | 3 Days | LS | 0 | 74 |
| | | Mobile Batch Plant[f] | 76 | 67 | No | LS | Yes | 2 Days | LS | 0 | 67 |
| | Repaving | Paving Equipment (roller) | 80 | 69 | No | LS | Yes | 2 Days | LS | 0 | 69 |
| | | Compactor | 83 | 72 | No | LS | Yes | 2 Days | LS | 0 | 72 |
| | | | | 84 | Total Construction Days at One Receptor: | | | 6 Days | | | |

## TABLE 3.11-5 (Continued)
## ESTIMATED DAYTIME CONSTRUCTION NOISE LEVELS

| Pipeline and Closest Noise-Sensitive Receptor Location | Construction Activity | Principal Noise Sources | Reference Noise Level, Lmax in dBA at 50 feet[a] | Leq Noise Level Adjusted for Distance and Usage | Impact 3.11-1: Leq Exceeds 75-dBA Ordinance Daytime Noise Limit? | Impact 3.11-1: Impact 3.11-1 Significance Determination | Impact 3.11-2: Leq Exceeds 70-dBA Speech Interference Threshold? | Impact 3.11-2: Duration of Construction[b] (Workdays) | Impact 3.11-2: Impact 3.11-2 Significance Determination | Noise Reduction From Mitigation Measure NOI-1 and NOI-2b | Mitigated $L_{eq}$ With Mitigation Measure NOI-1 and NOI-2b |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Open Trench Pipeline Construction*** | | | | | | | | | | | |
| *Central Pressure Zone Pipeline (Richmond/San Pablo)* | | *Richmond Ordinance Noise Limit for Short-term Construction Activities:* | | | *75 dBA* | | | | | | |
| Closest residential | Pavement Cutting | Pavement Saw | 90 | 88 | Yes | **SU** | Yes | 1 Day | LS | 0 | **88** |
| receptor at 404 | | Jackhammer | 89 | 87 | Yes | **SU** | Yes | 1 Day | LS | -5 | **82** |
| 23rd Street | Excavation and | Excavator | 81 | 85 | Yes | **SU** | Yes | 3 Days | LS | 0 | **85** |
| | Pipe Installation | Various Trucks (dump, flatbed, water) | 76 | 80 | Yes | **SU** | Yes | 3 Days | LS | 0 | **80** |
| | | Backhoe, Loader, Forklift | 79 | 83 | Yes | **SU** | Yes | 3 Days | LS | 0 | **83** |
| | | Mobile Batch Plant[f] | 76 | 76 | Yes | **SU** | Yes | 2 Days | LS | 0 | **76** |
| | Repaving | Paving Equipment (roller) | 80 | 78 | Yes | **SU** | Yes | 2 Days | LS | 0 | **78** |
| | | Compactor | 83 | 81 | Yes | **SU** | Yes | 2 Days | LS | 0 | **81** |
| | | | | 93 | Total Construction Days at One Receptor: | | | 6 Days | | | |
| *Central Pressure Zone Pipeline (Richmond/San Pablo)* | | *San Pablo Ordinance Noise Limit for Short-term Construction Activities:* | | | *None* | | | | | | |
| Closest residential | Pavement Cutting | Pavement Saw | 90 | 94 | - | - | Yes | 1 Day | LS | 0 | 94 |
| receptors on: 23rd | | Jackhammer | 89 | 93 | - | - | Yes | 1 Day | LS | -5 | 88 |
| Street, Brookside, | Excavation and | Excavator | 81 | 91 | - | - | Yes | 3 Days | LS | 0 | 91 |
| EBMUD ROW | Pipe Installation | Various Trucks (dump, flatbed, water) | 76 | 86 | - | - | Yes | 3 Days | LS | 0 | 86 |
| across San Pablo | | Backhoe, Loader, Forklift | 79 | 89 | - | - | Yes | 3 Days | LS | 0 | 89 |
| Creek to Road 20 | | Mobile Batch Plant[f] | 76 | 82 | - | - | Yes | 2 Days | LS | 0 | 82 |
| | Repaving | Paving Equipment (roller) | 80 | 84 | - | - | Yes | 2 Days | LS | 0 | 84 |
| | | Compactor | 83 | 87 | - | - | Yes | 2 Days | LS | 0 | 87 |
| | | | | 99 | Total Construction Days at One Receptor: | | | 6 Days | | | |
| ***Jack-and-Bore Construction*** | | | | | | | | | | | |
| *Wildcat Creek Crossing (San Pablo)* | | *San Pablo Ordinance Noise Limit for Short-term Construction Activities:* | | | *None* | | | | | | |
| Closest residential | Pit Excavation | Impact/Vibratory Sheetpile Driver[g] – Upper Range | 101 | 91 | - | - | Yes | 10 Days | **SM** | 0 | 91 |
| receptor to receiving | | Impact/Vibratory Sheetpile Driver – Lower Range | 75 | 65 | - | - | No | 10 Days | LS | 0 | 65 |
| pit across the street | | Excavator | 81 | 74 | - | - | Yes | 10 Days | **SM** | 0 | 74 |
| (2006 23rd Street) | | Various Trucks (dump, flatbed, water) | 76 | 69 | - | - | Yes | 10 Days | LS | 0 | 69 |
| | | Backhoe, Loader, Forklift | 79 | 72 | - | - | Yes | 10 Days | **SM** | 0 | 72 |
| | Pipe Installation | Boring Machine or Auger[h] | 84 | 77 | - | - | Yes | 20 Days | **SM** | -5 | 72 |
| | | Boring Jack Power Unit[h] | 83 | 76 | - | - | Yes | 20 Days | **SM** | -3 | 73 |
| | Repaving | Paving Equipment (roller) | 80 | 67 | - | - | Yes | 20 Days | LS | 0 | 67 |
| | | Compactor | 83 | 70 | - | - | Yes | 20 Days | LS | 0 | 70 |
| | | | | 92 | Total Construction Days at One Receptor: | | | 50 Days | | | |

## TABLE 3.11-5 (Continued)
## ESTIMATED DAYTIME CONSTRUCTION NOISE LEVELS

| Pipeline and Closest Noise-Sensitive Receptor Location | Construction Activity | Principal Noise Sources | Reference Noise Level, Lmax in dBA at 50 feet[a] | Leq Noise Level Adjusted for Distance and Usage | Impact 3.11-1: Leq Exceeds 75-dBA Ordinance Daytime Noise Limit? | Impact 3.11-1: Impact 3.11-1 Significance Determination | Impact 3.11-2: Leq Exceeds 70-dBA Speech Interference Threshold? | Impact 3.11-2: Duration of Construction[b] (Workdays) | Impact 3.11-2: Impact 3.11-2 Significance Determination | Noise Reduction From Mitigation Measure NOI-1 and NOI-2b | Mitigated $L_{eq}$ With Mitigation Measure NOI-1 and NOI-2b |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Pipe Bridge Construction*** | | | | | | | | | | | |
| *San Pablo Creek Crossing (San Pablo)* | | *San Pablo Ordinance Noise Limit for Short-term Construction Activities:* | | | *None* | | | | | | |
| Closest residential | Excavation and | Excavator | 81 | 74 | - | - | Yes | 5 Days | LS | 0 | 74 |
| receptors at 2215 | Bridge Construction | Various Trucks (dump, flatbed, water) | 76 | 69 | - | - | No | 5 Days | LS | 0 | 69 |
| Road 20 to the west | | Drill Rig | 84 | 74 | - | - | Yes | 5 Days | LS | 0 | 74 |
| and 41 Campo Verde | | Crane | 81 | 71 | - | - | Yes | 5 Days | LS | 0 | 71 |
| Circle to the east | | Backhoe, Loader, Forklift | 79 | 72 | - | - | Yes | 5 Days | LS | 0 | 72 |
| | Repaving | Paving Equipment (roller) | 80 | 67 | - | - | No | 5 Days | LS | 0 | 67 |
| | | Compactor | 83 | 70 | - | - | Yes | 5 Days | LS | 0 | 70 |
| | | | | 80 | Total Construction Days at One Receptor: | | | 20 Days | | | |
| ***Tie-in Construction*** | | | | | | | | | | | |
| *Wildcat Pipeline (Berkeley) Tie-ins* | | *Berkeley Ordinance Noise Limit for Short-term Construction Activities:* | | | *75 dBA* | | | | | | |
| Closest residential | Pit Excavation | Impact/Vibratory Sheetpile Driver[g] – Upper Range | 101 | 98 | Yes | **SM** | Yes | <10 Days | LS | 0 | 98 |
| receptors on: Dana/ | and Backfill | Impact/Vibratory Sheetpile Driver – Lower Range | 75 | 72 | No | LS | No | <10 Days | LS | 0 | 72 |
| Parker (north tie-in) | | Excavator | 81 | 81 | Yes | LS | Yes | <10 Days | LS | 0 | 81 |
| and Parker/Nogales | | Various Trucks (dump, flatbed, water) | 76 | 76 | Yes | LS | No | <10 Days | LS | 0 | 76 |
| (south tie-in) | | Backhoe, Loader, Forklift | 79 | 79 | Yes | LS | Yes | <10 Days | LS | 0 | 79 |
| | Pipe Connection | Hydraulic Compressor | 80 | 88 | Yes | **SU** | Yes | 1 Day | LS | -5 | 83 |
| | | Hot Tapping Machine | 78 | 86 | Yes | **SU** | Yes | 1 Day | LS | -5 | 81 |
| | | Hot Tapping Machine Motor/Generator | 81 | 89 | Yes | **SU** | Yes | 1 Day | LS | -5 | 84 |
| | | Various Trucks (dump, flatbed, water) | 76 | 92 | Yes | **SU** | Yes | 1 Day | LS | -5 | 87 |
| | | Backhoe, Loader, Forklift | 79 | 95 | Yes | **SU** | Yes | 1 Day | LS | -5 | 90 |
| | Testing | Dewatering Pump | 45 | 53 | No | LS | No | 25 Days | LS | -5 | 48 |
| | | | | 98 | Total Construction Days at One Receptor: | | | 25 Days | | | |
| *Wildcat Pipeline (El Cerrito) Tie-ins* | | *El Cerrito Ordinance Noise Limit for Short-term Construction Activities:* | | | *None* | | | | | | |
| Closest residential | Pit Excavation | Impact/Vibratory Sheetpile Driver[g] – Upper Range | 101 | 98 | - | - | Yes | <10 Days | LS | 0 | 98 |
| receptors at Liberty/Hill | and Backfill | Impact/Vibratory Sheetpile Driver – Lower Range | 75 | 72 | - | - | No | <10 Days | LS | 0 | 72 |
| (north tie-in) and | | Excavator | 81 | 81 | - | - | Yes | <10 Days | LS | 0 | 81 |
| Lynn/San Carlos | | Various Trucks (dump, flatbed, water) | 76 | 76 | - | - | Yes | <10 Days | LS | 0 | 76 |
| (south tie-in) | | Backhoe, Loader, Forklift | 79 | 79 | - | - | Yes | <10 Days | LS | 0 | 79 |
| | Pipe Connection | Hydraulic Compressor | 80 | 84 | - | - | Yes | 1 Day | LS | -5 | 79 |
| | | Hot Tapping Machine | 78 | 82 | - | - | Yes | 1 Day | LS | -5 | 77 |
| | | Hot Tapping Machine Motor/Generator | 81 | 85 | - | - | Yes | 1 Day | LS | -5 | 80 |
| | | Various Trucks (dump, flatbed, water) | 76 | 78 | - | - | Yes | 1 Day | LS | -5 | 73 |
| | | Backhoe, Loader, Forklift | 79 | 81 | - | - | Yes | 1 Day | LS | -5 | 76 |
| | Testing | Dewatering Pump | 45 | 49 | - | - | No | 25 Days | LS | -5 | 44 |
| | | | | 90 | Total Construction Days at One Receptor: | | | 25 Days | | | |

## TABLE 3.11-5 (Continued)
## ESTIMATED DAYTIME CONSTRUCTION NOISE LEVELS

| | | | | | Impact 3.11-1 | | Impact 3.11-2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pipeline and Closest Noise-Sensitive Receptor Location | Construction Activity | Principal Noise Sources | Reference Noise Level, Lmax in dBA at 50 feet[a] | Leq Noise Level Adjusted for Distance and Usage | Leq Exceeds 75-dBA Ordinance Daytime Noise Limit? | Impact 3.11-1 Significance Determination | Leq Exceeds 70-dBA Speech Interference Threshold? | Duration of Construction[b] (Workdays) | Impact 3.11-2 Significance Determination | Noise Reduction From Mitigation Measure NOI-1 and NOI-2b | Mitigated $L_{eq}$ With Mitigation Measure NOI-1 and NOI-2b |
| ***Tie-in Construction*** | | | | | | | | | | | |
| *Central Pressure Zone Pipeline (El Cerrito/Richmond) Tie-in Richmond Ordinance Noise Limit for Short-term Construction Activities:* | | | | | *75 dBA* | | | | | | |
| Closest residential receptors at San Pablo/ Nevin (north tie-in) | Pit Excavation and Backfill | Impact/Vibratory Sheetpile Driver[g] – Upper Range | 101 | 86 | Yes | **SM** | Yes | <10 Days | LS | 0 | 86 |
| | | Impact/Vibratory Sheetpile Driver – Lower Range | 75 | 60 | No | LS | No | <10 Days | LS | 0 | 60 |
| | | Excavator | 81 | 69 | No | LS | Yes | <10 Days | LS | 0 | 69 |
| | | Various Trucks (dump, flatbed, water) | 76 | 64 | No | LS | Yes | <10 Days | LS | 0 | 64 |
| | | Backhoe, Loader, Forklift | 79 | 67 | No | LS | Yes | <10 Days | LS | 0 | 67 |
| | Pipe Connection | Hydraulic Compressor | 80 | 72 | Yes | **SU** | Yes | 1 Day | LS | -5 | 67 |
| | | Hot Tapping Machine | 78 | 70 | Yes | **SU** | Yes | 1 Day | LS | -5 | 65 |
| | | Hot Tapping Machine Motor/Generator | 81 | 73 | Yes | **SU** | Yes | 1 Day | LS | -5 | 68 |
| | | Various Trucks (dump, flatbed, water) | 76 | 64 | Yes | **SU** | Yes | 1 Day | LS | -5 | 59 |
| | | Backhoe, Loader, Forklift | 79 | 67 | Yes | **SU** | Yes | 1 Day | LS | -5 | 62 |
| | Testing | Dewatering Pump | 45 | 49 | No | LS | No | 25 Days | LS | -5 | 44 |
| | | | | 77 | Total Construction Days at One Receptor: | | | 25 Days | | | |
| *Central Pressure Zone Pipeline (El Cerrito/Richmond) Tie-in El Cerrito Ordinance Noise Limit for Short-term Construction Activities:* | | | | | *None* | | | | | | |
| Closest residential receptors at San Pablo/ Central (south tie-in) | Pit Excavation and Backfill | Impact/Vibratory Sheetpile Driver[g] – Upper Range | 101 | 91 | - | - | Yes | <10 Days | LS | 0 | 91 |
| | | Impact/Vibratory Sheetpile Driver – Lower Range | 75 | 65 | - | - | No | <10 Days | LS | 0 | 65 |
| | | Excavator | 81 | 74 | - | - | Yes | <10 Days | LS | 0 | 74 |
| | | Various Trucks (dump, flatbed, water) | 76 | 69 | - | - | Yes | <10 Days | LS | 0 | 69 |
| | | Backhoe, Loader, Forklift | 79 | 72 | - | - | Yes | <10 Days | LS | 0 | 72 |
| | Pipe Connection | Hydraulic Compressor | 80 | 84 | - | - | Yes | 1 Day | LS | -5 | 79 |
| | | Hot Tapping Machine | 78 | 82 | - | - | Yes | 1 Day | LS | -5 | 77 |
| | | Hot Tapping Machine Motor/Generator | 81 | 85 | - | - | Yes | 1 Day | LS | -5 | 80 |
| | | Various Trucks (dump, flatbed, water) | 76 | 86 | - | - | Yes | 1 Day | LS | -5 | 81 |
| | | Backhoe, Loader, Forklift | 79 | 89 | - | - | Yes | 1 Day | LS | -5 | 84 |
| | Testing | Dewatering Pump | 45 | 49 | - | - | No | 25 Days | LS | -5 | 44 |
| | | | | 93 | Total Construction Days at One Receptor: | | | 25 Days | | | |
| *Central Pressure Zone Pipeline (Richmond/San Pablo) Tie-in San Pablo Ordinance Noise Limit for Short-term Construction Activities:* | | | | | *None* | | | | | | |
| Closest residential receptor at Road 20th/21st (north tie-in) | Pit Excavation and Backfill | Impact/Vibratory Sheetpile Driver[g] – Upper Range | 101 | 91 | - | - | Yes | <10 Days | LS | 0 | 91 |
| | | Impact/Vibratory Sheetpile Driver – Lower Range | 75 | 65 | - | - | No | <10 Days | LS | 0 | 65 |
| | | Excavator | 81 | 74 | - | - | Yes | <10 Days | LS | 0 | 74 |
| | | Various Trucks (dump, flatbed, water) | 76 | 69 | - | - | No | <10 Days | LS | 0 | 69 |
| | | Backhoe, Loader, Forklift | 79 | 72 | - | - | Yes | <10 Days | LS | 0 | 72 |
| | Pipe Connection | Hydraulic Compressor | 80 | 88 | - | - | Yes | 1 Day | LS | -5 | 83 |
| | | Hot Tapping Machine | 78 | 86 | - | - | Yes | 1 Day | LS | -5 | 81 |
| | | Hot Tapping Machine Motor/Generator | 81 | 89 | - | - | Yes | 1 Day | LS | -5 | 84 |
| | | Various Trucks (dump, flatbed, water) | 76 | 84 | - | - | Yes | 1 Day | LS | -5 | 79 |
| | | Backhoe, Loader, Forklift | 79 | 87 | - | - | Yes | 1 Day | LS | -5 | 82 |
| | Testing | Dewatering Pump | 45 | 53 | - | - | No | 25 Days | LS | -5 | 48 |
| | | | | 94 | Total Construction Days at One Receptor: | | | 25 Days | | | |

**TABLE 3.11-5 (Continued)**
**ESTIMATED DAYTIME CONSTRUCTION NOISE LEVELS**

| | | | | | Impact 3.11-1 | | Impact 3.11-2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pipeline and Closest Noise-Sensitive Receptor Location | Construction Activity | Principal Noise Sources | Reference Noise Level, Lmax in dBA at 50 feet[a] | Leq Noise Level Adjusted for Distance and Usage | Leq Exceeds 75-dBA Ordinance Daytime Noise Limit? | Impact 3.11-1 Significance Determination | Leq Exceeds 70-dBA Speech Interference Threshold? | Duration of Construction[b] (Workdays) | Impact 3.11-2 Significance Determination | Noise Reduction From Mitigation Measure NOI-1 and NOI-2b | Mitigated $L_{eq}$ With Mitigation Measure NOI-1 and NOI-2b |
| ***Tie-in Construction*** | | | | | | | | | | | |
| *Central Pressure Zone Pipeline (Richmond/San Pablo) Tie-in Richmond Ordinance Noise Limit for Short-term Construction Activities:* | | | | | *75 dBA* | | | | | | |
| Closest residential receptors at 23rd/Nevin (south tie-in) | Pit Excavation and Backfill | Impact/Vibratory Sheetpile Driver[g] – Upper Range | 101 | 91 | Yes | **SM** | Yes | <10 Days | LS | 0 | 91 |
| | | Impact/Vibratory Sheetpile Driver – Lower Range | 75 | 65 | No | LS | No | <10 Days | LS | 0 | 65 |
| | | Excavator | 81 | 74 | No | LS | Yes | <10 Days | LS | 0 | 74 |
| | | Various Trucks (dump, flatbed, water) | 76 | 69 | No | LS | Yes | <10 Days | LS | 0 | 69 |
| | | Backhoe, Loader, Forklift | 79 | 72 | No | LS | Yes | <10 Days | LS | 0 | 72 |
| | Pipe Connection | Hydraulic Compressor | 80 | 82 | Yes | **SU** | Yes | 1 Day | LS | -5 | 77 |
| | | Hot Tapping Machine | 78 | 80 | Yes | **SM** | Yes | 1 Day | LS | -5 | 75 |
| | | Hot Tapping Machine Motor/Generator | 81 | 83 | Yes | **SU** | Yes | 1 Day | LS | -5 | 78 |
| | | Various Trucks (dump, flatbed, water) | 76 | 80 | Yes | **SM** | Yes | 1 Day | LS | -5 | 75 |
| | | Backhoe, Loader, Forklift | 79 | 83 | Yes | **SU** | Yes | 1 Day | LS | -5 | 78 |
| | Testing | Dewatering Pump | 45 | 47 | No | LS | No | 25 Days | LS | -5 | 42 |
| | | | | 89 | Total Construction Days at One Receptor: | | | 25 Days | | | |

NOTES: Noise Levels in **BOLD** indicate a significant impact because they exceed the ordinance noise limit and/or exceed the 70-dBA speech interference threshold for longer than 2 weeks (10 weekdays). "SU" indicates the impact would be significant and could not be reduced to a less-than-significant level with specified mitigation measures.

a Reference noise levels are based on noise measurements collected during construction of the Central Artery/Tunnel Project (completed in 2007), and these measurements also serve as default values in the FHWA Roadway Construction Noise Model. Available online at: http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm. For distances and usage factors applied in this analysis to each noise source at each receptor location, see Table I-6 in Appendix I.

b For daytime noise, significance is determined based on whether both the speech interference threshold and two-week construction duration threshold is exceeded at a given receptor.

SOURCE: Orion Environmental Associates.

**Table 3.11-6** presents the estimated Project-related ***nighttime*** construction noise levels along the pipeline alignments for potential nighttime construction activities (e.g., the tie-ins or intersections).The organization and basic content of Table 3.11-6 is the same as Table 3.11-5, but the significance thresholds are based on ordinance nighttime noise limits (Impact 3.11-1) and the sleep disturbance threshold (Impact 3.11-2).

**Figure 3.11-4** graphically depicts estimated Leq noise levels at 50 feet by construction activity and duration (as listed in Table 3.11-6), and then compares them with common noise levels and existing ambient noise levels along project area residential streets.

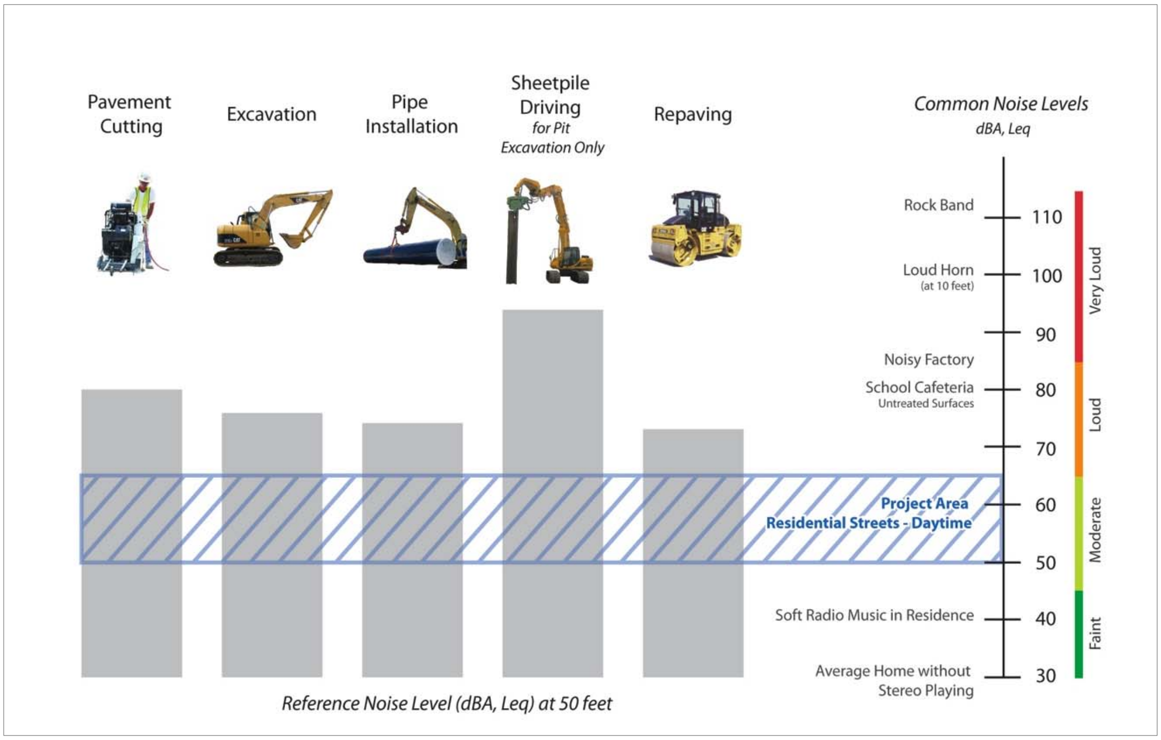


**Figure 3.11-4**
Comparison of Existing and Project Noise Levels

Potential impacts are described in further detail by jurisdiction in the sections that follow.

## *Wildcat Pipelines*

This section addresses the impacts of the proposed Wildcat Pipeline (Berkeley) and the proposed Wildcat Pipeline (El Cerrito).

### City of Berkeley

**Pipeline Construction.** As described above in the Approach to Analysis section under Methodology, proposed work hours along the Wildcat Pipeline (Berkeley) alignment would generally be consistent with the Berkeley Noise Ordinance time limits, a *less-than-significant* impact.

## TABLE 3.11-6
## ESTIMATED NIGHTTIME CONSTRUCTION NOISE LEVELS

| Pipeline and Closest Noise-Sensitive Receptor Location | Construction Activity | Principal Noise Source | Reference Noise Level, $L_{max}$ in dBA at 50 feet[a] | $L_{eq}$ Noise Level Adjusted for Distance and Usage | Impact 3.11-1: Exceeds 54-dBA Ordinance Nighttime Noise Limit? | Impact 3.11-1: Impact 3.11-1 Significance Determination | Impact 3.11-2: Exceeds 60-dBA Sleep Disturbance Threshold? | Impact 3.11-2: Duration of Construction[b] (Workdays) | Impact 3.11-2: Impact 3.11-2 Significance Determination |
|---|---|---|---|---|---|---|---|---|---|
| ***Tie-in Construction*** | | | | | | | | | |
| *Wildcat Pipeline Tie-ins (Berkeley)* | | *Berkeley Ordinance Noise Limit for Nighttime Construction Activities:* | | | *54* | | | | |
| Closest residential receptors on: Parkside and Dana | Pipe Connection | Hydraulic Compressor | 80 | 88 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Hot Tapping Machine | 78 | 86 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Hot Tapping & Lighting Generators | 84 | 92 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Various Trucks (dump, flatbed, water) | 76 | 92 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Backhoe, Loader, Forklift | 79 | 95 | Yes | **SU** | Yes | 1 Day | **SU** |
| | Testing | Dewatering Pump | 45 | 53 | No | LS | No | 20 Days | LS |
| | | | | 99 | Total Construction Days at One Receptor: | | | 1 Day | |
| *Wildcat Pipeline Tie-ins (El Cerrito)* | | *El Cerrito Ordinance Noise Limit for Nighttime Construction Activities:* | | | *None* | | | | |
| Closest residential receptors at Liberty/Hill (north tie-in) and Lynn/San Carlos (south tie-in) | Pipe Connection | Hydraulic Compressor | 80 | 84 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Hot Tapping Machine | 78 | 82 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Hot Tapping & Lighting Generators | 84 | 88 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Various Trucks (dump, flatbed, water) | 76 | 78 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Backhoe, Loader, Forklift | 79 | 81 | Yes | **SU** | Yes | 1 Day | **SU** |
| | Testing | Dewatering Pump | 45 | 49 | No | LS | No | 20 Days | LS |
| | | | | 91 | Total Construction Days at One Receptor: | | | 1 Day | |
| *Central Pressure Zone Pipeline Tie-ins (El Cerrito)* | | *El Cerrito Ordinance Noise Limit for Nighttime Construction Activities:* | | | *None* | | | | |
| Closest residential receptors at San Pablo/ Nevin (north tie-in) and San Pablo/Central (south tie-in) | Pipe Connection | Hydraulic Compressor | 80 | 84 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Hot Tapping Machine | 78 | 82 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Hot Tapping & Lighting Generators | 84 | 88 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Various Trucks (dump, flatbed, water) | 76 | 86 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Backhoe, Loader, Forklift | 79 | 89 | Yes | **SU** | Yes | 1 Day | **SU** |
| | Testing | Dewatering Pump | 45 | 49 | No | LS | No | 20 Days | LS |
| | | | | 94 | Total Construction Days at One Receptor: | | | 1 Day | |
| *Central Pressure Zone Pipeline Tie-in (Richmond)* | | *Richmond Ordinance Noise Limit for Nighttime Construction Activities:* | | | *54* | | | | |
| Closest residential receptor at Road 20th/21st (north tie-in) | Pipe Connection | Hydraulic Compressor | 80 | 88 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Hot Tapping Machine | 78 | 86 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Hot Tapping & Lighting Generators | 84 | 92 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Various Trucks (dump, flatbed, water) | 76 | 84 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Backhoe, Loader, Forklift | 79 | 87 | Yes | **SU** | Yes | 1 Day | **SU** |
| | Testing | Dewatering Pump | 45 | 53 | No | LS | No | 20 Days | LS |
| | | | | 95 | Total Construction Days at One Receptor: | | | 1 Day | |
| *Central Pressure Zone Pipeline Tie-in (San Pablo)* | | *San Pablo Ordinance Noise Limit for Nighttime Construction Activities:* | | | *None* | | | | |
| Closest residential receptors at 23rd/Nevin (south tie-in) | Pipe Connection | Hydraulic Compressor | 80 | 82 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Hot Tapping Machine | 78 | 80 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Hot Tapping & Lighting Generators | 84 | 86 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Various Trucks (dump, flatbed, water) | 76 | 80 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Backhoe, Loader, Forklift | 79 | 83 | Yes | **SU** | Yes | 1 Day | **SU** |
| | Testing | Dewatering Pump | 45 | 47 | No | LS | No | 20 Days | LS |
| | | | | 90 | Total Construction Days at One Receptor: | | | 1 Day | |
| ***Open Trench Pipeline Construction at Some Major Intersections*** | | | | | | | | | |
| *Intersections (All Locations)* | | *Berkeley and Richmond Ordinance Noise Limit for Nighttime Construction Activities:* | | | *54* | | | | |
| Minimum Distance from Residential Receptors | Pavement Cutting | Pavement Saw | 90 | 88 | Yes | **SU** | Yes | 1 Day | **SU** |
| | | Jackhammer | 89 | 87 | Yes | **SU** | Yes | 1 Day | **SU** |
| | Excavation and Pipe Installation | Excavator | 81 | 85 | Yes | **SU** | Yes | 3 Days | **SU** |
| | | Various Trucks (dump, flatbed, water) | 76 | 80 | Yes | **SU** | Yes | 3 Days | **SU** |
| | | Backhoe, Loader, Forklift | 79 | 83 | Yes | **SU** | Yes | 3 Days | **SU** |
| | | Mobile Batch Plant | 76 | 76 | Yes | **SU** | Yes | 2 Days | **SU** |
| | Repaving | Paving Equipment (roller) | 80 | 78 | Yes | **SU** | Yes | 2 Days | **SU** |
| | | Compactor | 83 | 81 | Yes | **SU** | Yes | 2 Days | **SU** |
| | | | | 93 | Total Construction Days at One Receptor: | | | 6 Days | |

NOTES: Noise Levels in **BOLD** indicate a significant impact because they exceed the ordinance noise limit and/or exceed the 60-dBA sleep disturbance threshold. "SU" indicates the impact would be significant and could not be reduced to a less-than-significant level with specified mitigation measures.

a Reference noise levels are based on noise measurements collected during construction of the Central Artery/Tunnel Project (completed in 2007), and these measurements also serve as default values in the FHWA Roadway Construction Noise Model. Available online at: http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm. For distances and usage factors applied in this analysis to each noise source at each receptor location, see Table I-7 in Appendix I.

b For nighttime noise, significance is based solely on whether the estimated noise level exceeds the 60-dBA sleep disturbance threshold (i.e., construction duration is not a factor) since even one night of sleep disruption is considered significant.

SOURCE: Orion Environmental Associates.

The Berkeley Noise Ordinance also specifies a daytime weekday noise limit of 75 dBA for mobile equipment operating less than 10 days. As indicated in Table 3.11-5, the proximity of equipment to residential receptors along this alignment would result in noise levels that exceed the 75-dBA ordinance noise limit, a significant impact. Implementation of Mitigation Measure NOI-1, which establishes time limits, administrative measures, and source controls, would help reduce noise levels, but could not reduce them below the 75-dBA limit. Therefore, exceedance of the 75-dBA ordinance noise limit would be a *significant and unavoidable* impact.

**Tie-in Construction.** Construction of pipeline tie-ins would occur at the two connection points of this pipeline in Berkeley: (1) Nogales Street just north of Parkside Drive, and (2) Dana Street at Parker Street, both residential neighborhoods. If nighttime work is required during the hot tap process, estimated construction noise levels would exceed the ordinance nighttime noise limit of 54 dBA. Although hot-tapping is expected to be completed during the daytime hours, it is possible that this activity could extend into the evening and nighttime hours for one night. Despite this short duration (one night at most), it is still considered a significant impact because noise levels would exceed the City's noise limit. Implementation of Mitigation Measures NOI-1, including the avoidance of hot-tapping and heavy equipment operation during the nighttime hours (to the extent feasible), would reduce this impact but not necessarily to a less-than-significant level. This impact would be *significant and unavoidable*.

Operation of a small dewatering pump might be required for up to 1 month at some locations. Although pumps would operate continuously (24 hours per day, 7 days per week), noise levels (53 dBA at the closest receptors assuming a small pump size of approximately 1 to 2 horsepower) would not exceed the 54-dBA ordinance nighttime noise limit. Therefore, noise generated by a dewatering pump at each tie-in location is expected have a *less-than-significant* impact on adjacent residences.

**Nighttime Intersection Construction.** If required by encroachment permit conditions, construction through some street intersections could occur during the more noise-sensitive nighttime hours to avoid traffic impacts. If nighttime work is required, estimated construction noise levels would exceed the ordinance nighttime noise limit of 54 dBA (see Table 3.11-6). Implementation of Mitigation Measures NOI-1, which includes administrative and source control measures, would reduce this impact but not necessarily to a less-than-significant level. If such nighttime construction activities occur, this impact would be *significant and unavoidable*.

#### City of El Cerrito

**Pipeline Construction.** For construction work within the public right-of-way, the City of El Cerrito requires an encroachment permit. While construction time limits will be determined on a case-by-case basis as part of the encroachment permit review process, the City's standard encroachment permit conditions indicate that time limits within the public right-of-way shall be 8:00 a.m. to 5:00 p.m., Monday – Friday (excluding holidays) or as directed by the City Engineer (City of El Cerrito, 2009). The El Cerrito Municipal Code does not include construction noise limits, and no policies or guidelines related to construction limits are provided in the El Cerrito General Plan. Therefore, the project's proposed work hours (8:00 a.m. to 7:00 p.m.) would conflict with El Cerrito's encroachment permit standard conditions by two hours (from 5 p.m. to 7 p.m.), but would not conflict with the city's Municipal Code or General Plan with respect to construction noise limits. However, since the City of El Cerrito will specify appropriate time limits for construction within public rights-of-way as a permit condition; with compliance, *no impact* would occur.

**Tie-in Construction.** Construction of pipeline tie-ins would occur at the two connection points of this pipeline in El Cerrito: (1) Lynn Avenue at San Carlos Drive, and (2) Liberty Street at Hill Street, both residential neighborhoods. Hot-tapping construction activities could occur continuously over one 24-hour period to avoid interruption of water service. If nighttime work is required or if dewatering pumps must be operated continuously for up to 1 month at these locations, such operations would conflict with time limits specified in El Cerrito's encroachment permit standard conditions. Operation of equipment beyond these time limits would have to be permitted as part of the required encroachment permit; compliance with these conditions would ensure that *no impact* would occur. The Project would not conflict with any noise limits because the City of El Cerrito does not specify noise limits in its ordinances or policies.

**Nighttime Intersection Construction.** Any stipulation for nighttime construction through street intersections would be addressed within El Cerrito's encroachment permit. Compliance with these conditions would ensure that *no impact* would occur. The Project would not conflict with any noise limits because the City of El Cerrito does not specify noise limits in its ordinances or policies.

### *Central Pressure Zone Pipeline*

This section addresses the Central Pressure Zone Pipeline (El Cerrito/Richmond) and Central Pressure Zone Pipeline (Richmond/San Pablo).

#### City of El Cerrito

As identified for construction of the Wildcat Pipeline (El Cerrito), construction of the Central Pressure Zone Pipeline (El Cerrito/Richmond) would not conflict with any noise limits because the City of El Cerrito does not specify noise limits in its ordinances or policies. Compliance with time restrictions stipulated in encroachment permit from the City of El Cerrito would ensure that *no impact* would occur.

#### City of Richmond

**Pipeline Construction.** The proposed work hours for pipeline construction along the Central Pressure Zone Pipeline (El Cerrito/Richmond) and Central Pressure Zone Pipeline (Richmond/San Pablo) alignments would generally be consistent with the City of Richmond Noise Ordinance weekday time limits.

The Richmond Noise Ordinance specifies a daytime weekday noise limit of 75 dBA for mobile equipment operating less than 15 days. As indicated in Table 3.11-5, construction-related noise levels would exceed the 75-dBA ordinance noise limit, a significant impact. Implementation of

Mitigation Measure NOI-1 (source controls) would help reduce noise emitted from certain sources to a less-than-significant level, but could not reduce noise from pavement saws and some heavy equipment to below the 75-dBA limit. Therefore, exceedance of the 75-dBA ordinance noise limit would be a *significant and unavoidable* impact.

**Tie-in Construction.** Tie-in construction would occur at two connection points in the city of Richmond: (1) the northern end of the Central Pressure Zone Pipeline (El Cerrito/Richmond) would tie in at San Pablo Avenue and Nevin Avenue; and (2) the southern end of the Central Pressure Zone Pipeline (Richmond/San Pablo) would tie in at 23rd Street and Nevin Avenue, which are both commercial areas but there is one apartment building adjacent to the second location. If nighttime construction is required for hot-tapping, noise levels would exceed the ordinance nighttime noise limit of 54 dBA (see Table 3.11-3 for ordinance limits and Table 3.11-6 for estimated nighttime noise levels). Although the potential for nighttime construction is expected to be limited to one night, the impact is still considered significant because noise levels would exceed the City's noise limit. Implementation of Mitigation Measures NOI-1, including the avoidance of hot-tapping and heavy equipment operation during the nighttime hours (to the extent feasible), would reduce this impact but not necessarily to a less-than-significant level. This impact would be *significant and unavoidable*.

Operation of a small dewatering pump would also be required for up to 1 month at some locations. Although pumps would operate continuously (24 hours per day, 7 days per week), noise levels (53dBA at the closest receptors) would not exceed the 54-dBA ordinance nighttime noise limit. Therefore, noise generated by a dewatering pump at each tie-in location would have a *less-than-significant* impact on adjacent residences.

**Nighttime Intersection Construction.** If required by encroachment permit conditions, construction through some street intersections may occur at night to avoid traffic impacts. If nighttime work is required, estimated construction noise levels would exceed the ordinance nighttime noise limit of 54 dBA. Implementation of Mitigation Measures NOI-1, which includes administrative and source control measures, would reduce this impact but not necessarily to a less-than-significant level. This impact would be *significant and unavoidable*.

### City of San Pablo

**Pipeline Construction.** The City of San Pablo Municipal Code limits construction hours to 7:00 a.m. to 10:00 p.m. on weekdays while the San Pablo General Plan Noise Element limits construction hours to 7:00 a.m. to 9:00 p.m. The San Pablo Municipal Code does not include construction noise limits, and there are no policies or guidelines related to construction limits provided in the San Pablo General Plan Noise Element. The Project's proposed work hours (8:00 a.m. to 7:00 p.m.) would be consistent with these construction time limits and the Project would not conflict with San Pablo's Municipal Code or General Plan with respect to construction noise limits. Thus, *no impact* would occur.

**Tie-in Construction.** Construction of the northern pipeline tie-in would occur at one of two possible connection points in San Pablo: (1) Road 20 near 21st Street, or (2) Road 20 near

San Pablo Avenue, which is a residential neighborhood at the first location, and mixed use (residential and commercial) at the second location. Tie-in construction could extend beyond the ordinance daytime time limits during one 24-hour period. In addition, continuous operation of a small dewatering pump may be required for up to 1 month at some locations (resulting in noise levels of 47dBA at the closest receptors). Operation of equipment beyond the ordinance daytime time limit is permitted only with written permission from the City of San Pablo's building inspector (or in the case of an emergency); compliance with these conditions would ensure that *no impact* would occur.

**Nighttime Intersection Construction.** Any stipulation for nighttime construction through street intersections would be addressed within City of San Pablo's encroachment permit. Compliance with these conditions and with written permission from the City of San Pablo's building inspector would ensure that *no impact* would occur.

**Creek Crossings.** The proposed Central Pressure Zone pipeline (Richmond/San Pablo) would cross Wildcat Creek and San Pablo Creek. The proposed pipeline would cross beneath Wildcat Creek using the jack and bore construction method. A pipe bridge would be constructed to pass over San Pablo Creek.

Construction-related noise levels associated with proposed jack and bore construction are presented in Table 3.11-5 (near the bottom). As indicated in this table, the noisiest phase of jack and bore construction would occur during excavation and shoring of the jacking and receiving pits when impact or vibratory sheet pile drivers would be used. Pipe bridges would generate lower construction-related noise levels because bridge supports would be drilled and pile drivers would not be used. Daytime construction(weekdays, 8:00 a.m. to 7:00 p.m.) is proposed for creek crossings, which would be consistent with the San Pablo Noise Ordinance and Noise Element weekday time limits (7 a.m. to 9 p.m. or 10 p.m.), and *no impact* would occur.

**Mitigation Measure NOI-1: Time Limits, Administrative Controls, and Source Controls.**

An acoustical consultant qualified in construction noise control analysis and design will prepare a Noise Control Plan for each pipeline. This plan will include noise controls for all construction activities to reduce the noise to the 75-dBA (Leq) ordinance daytime noise limit and 54-dBA (Leq) ordinance nighttime noise limit to the extent feasible. These limits may be increased if ambient noise levels are higher, consistent with applicable ordinances. Measures to reduce noise levels and disturbance from construction noise to be incorporated into the Noise Control Plan will include, but are not be limited to, the following:

***Time Limits***

a. All construction activities, including truck operations (e.g., haul trucks and concrete delivery trucks), will be limited to the daytime weekday hours (8:00 a.m. to 7:00 p.m.) to the extent feasible.

***Noise Level Reduction Measures***

b. Best available noise-control techniques (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) will be used for all equipment and trucks, as necessary.

c. Stationary noise sources (e.g., pumps, compressors) will be located as far from sensitive receptors as possible and practicable and within the specified construction time limits. If they must be located near receptors, adequate muffling (with enclosures) will be used. Enclosure openings or venting will face away from sensitive receptors. A registered engineer qualified in noise control analysis and design will design the enclosures.

d. If impact equipment (e.g., jackhammers) is used during demolition or construction activities, the construction contractor(s) will use hydraulically or electrically powered equipment wherever practical to avoid the noise associated with compressed-air exhaust from pneumatically powered tools. However, where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed-air exhaust will be used (a muffler can lower noise levels from the exhaust by up to about 10 dB). External jackets on the tools themselves will be used, where feasible, which could achieve a reduction of 5 dB. Quieter procedures, such as drilling rather than impact equipment, will be used whenever practical.

e. An EBMUD contact person will be designated to respond to construction-related issues, including noise. The phone number and email address of the liaison will be conspicuously posted at construction areas, on all advanced notifications, and on the EBMUD project website. This person will take steps to resolve complaints, including coordinating periodic noise monitoring, if necessary.

f. Residents located within 300 feet of project construction will be notified at least seven (7) days in advance of extreme noise-generating activities about the estimated duration of the activity. EBMUD will also send emails to individuals on the Project's mailing list to update them prior to noisy phases.

g. At pipeline tie-ins, in an effort to minimize the potential of the work extending beyond the above daytime time limits (8 a.m. and 7 p.m.),the contractor will be required to begin pipe-cutting operations for the hot-tapping connection prior to 9 a.m. or wait until the following morning in order to minimize the potential for pipe-cutting equipment to operate during the evening and nighttime hours. If pipe-cutting equipment must be operated during the nighttime hours at pipeline tie-ins, temporary noise barriers or noise enclosures will be used to minimize disturbance when construction occurs adjacent to residential uses. In addition, operation of trucks and noisier types of heavy equipment will be minimized to the extent feasible.

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**Impact 3.11-2: Construction activities could result in substantial temporary noise increases that could interfere with activities at nearby noise-sensitive land uses (applies to all pipelines).**

## *Wildcat Pipelines*

This section provides a more detailed description of potential impacts along both segments of the proposed Wildcat Pipeline in Berkeley and El Cerrito.

### City of Berkeley

**Wildcat Pipeline (Berkeley).** As shown in Table 3.11-5, daytime noise levels along this pipeline alignment are estimated to range between 72 and 84 dBA (Leq) at the closest receptors (up to

89 dBA, Leq, combined). These levels would exceed the 70-dBA speech interference threshold over approximately 6 work days at any given receptor. While such effects would, at times, be noticeable to adjacent residents, they are considered to be *less than significant* because they would affect any given receptor for less than 10 work days, or 2 weeks.[1] Implementation of Mitigation Measure NOI-1, which includes administrative and source control measures, would further reduce the effects of construction noise.

Schools located within approximately 250 feet of the Wildcat Pipeline (Berkeley) alignment, as listed in Table 3.3-4, could be affected by Project-related construction noise if it occurs during the daytime hours when school is in session and there is a direct line-of-sight between equipment and the school. Affected schools could be subject to occasional speech interference effects. While EBMUD proposes to schedule pipeline construction directly in front of schools during school breaks, construction noise levels along the alignment within 250 feet of school buildings (but not in front of the school) could still exceed the 70-dBA speech interference threshold, even with implementation of the noise control measures (Mitigation Measure NOI-1), a potentially significant impact. However, with implementation of Mitigation Measures NOI-1 and NOI-2, which would include administrative and source controls as well as coordination with schools for construction within 250 feet of schools, this impact would be reduced to a *less-than-significant* level for schools.

If the Benvenue Avenue alternative alignment is constructed, the Berkeley Claremont Library is located adjacent to this alignment and library activities could be temporarily disrupted when construction activities occur within 250 feet of the library. While speech interference effects are less of an issue for libraries than schools, it may be difficult to maintain a quiet library environment. However, library users seeking a quiet environment can access other Berkeley public libraries during the short two-week construction duration in the library vicinity. With implementation of Mitigation Measures NOI-1 and NOI-2, which would include administrative and source controls as well as coordination with the library for construction within 250 feet of the library to the extent feasible, this impact would be reduced to a *less-than-significant* level given the availability of other libraries in the city in the event that construction activities could not avoid library hours.

**Tie-in Construction.** As shown in Table 3.11-5, daytime construction noise levels at the tie-in locations are estimated to range between 53 to 91 dBA Leq at the closest locations, levels that exceed the 70-dBA speech interference threshold. Nighttime noise levels at tie-in locations (see Table 3.11-6) are estimated to range between 86 and 95dBA (Leq) at the closest receptors (up to 98dBA, Leq, combined); these levels would exceed the 60-dBA sleep disturbance threshold, a significant impact.

Implementation of Mitigation Measure NOI-1, including administrative and source controls and Mitigation Measure NOI-3, providing alternative lodging for affected residents, would reduce this

1 Daycare facilities (i.e. Claremont Day Nursery) located adjacent to pipeline alignments would be subject to noise impacts similar to residential uses.

impact but not necessarily to a less-than-significant level. As a result, the impact of daytime and nighttime construction on noise levels at the tie-in locations would be *significant and unavoidable*.

**Nighttime Intersection Construction.** If required by encroachment permit conditions, construction through some street intersections may occur at night to avoid traffic impacts. Nighttime noise levels at these locations (see Table 3.11-6) are estimated to range between 76 and 88 dBA (Leq) at the closest receptors (up to 93 dBA, Leq, combined); these levels would exceed the 60-dBA sleep disturbance threshold, a significant impact. Implementation of Mitigation Measure NOI-1, including administrative and source controls and Mitigation Measure NOI-3, providing alternative lodging for affected residents, would reduce this impact but not necessarily to a less-than-significant level. As a result, the impact of nighttime construction on noise levels at the tie-in locations would be *significant and unavoidable*.

**Truck Traffic Increases on Local Roadways.** Truck noise levels depend on vehicle speed, load, terrain, and other factors. The effects of construction-related truck traffic would depend on the level of background noise already occurring at a particular receptor site. In quiet environments or during quieter times of the day, truck noise is mainly a single-event disturbance. Although the hourly average noise level associated with short, single events is not very high, individual noise peaks of 75 to 80dBA at 50 feet are common during a truck passage.[2] However, in noisy environments or during less noise-sensitive hours, truck noise is perceived as part of the total noise environment rather than as an individual disturbance. Therefore, this analysis focuses on noise levels associated with hourly haul truck volumes (rather than a single passing truck).

Haul truck volumes associated with the proposed Project would vary from day to day, with the highest volumes generally occurring during the excavation, backfilling, and repaving stages of pipeline construction. The Project would generate approximately 31 haul/delivery trucks per day, with a maximum of eight hourly one-way truck trips. Noise levels generated by average haul/delivery truck traffic along haul/delivery routes would be approximately 59 dBA (Leq) at 50 feet. Compared to existing background noise levels, truck noise would not noticeably increase the noise exposure along collector residential streets like Dwight Way or Claremont Avenue (Leq averaging 60 dBA), or along noisier corridors such as Telegraph Avenue or Ashby Avenue (Leq averaging 70 dBA). Noise level increases would be noticeable when compared with ambient noise levels along quiet residential streets in Berkeley (Leq averaging 50 dBA), but levels would not exceed the 70-dBA speech interference threshold; therefore, this impact would be *less than significant*. Mitigation Measure NOI-1 would restrict truck operations to the daytime weekday hours, which would further minimize the potential for disturbance from truck noise on local streets.

### City of El Cerrito

**Construction of Wildcat Pipeline (El Cerrito).** As shown in Table 3.11-5, daytime construction noise levels along this pipeline alignment are estimated to range between 74 and 86 dBA (Leq) at the closest receptors (up to 91 dBA, Leq, combined), which would exceed the 70-dBA speech interference threshold at times over approximately 6 work days at any given receptor. While such

[2] California Vehicle Code (Section 27204) limits noise from trucks to 80 dBA (models after 1987).

effects would, at times, be noticeable to adjacent residents, they are considered to be *less than significant* because they would affect any given receptor for less than 10 work days, or 2 weeks. Implementation of Mitigation Measure NOI-1, which includes administrative and source controls, would further reduce the effects of construction noise.

Pipeline construction within 250 feet of school buildings, as shown in Table 3.3-4, could result in noise levels that exceed the 70-dBA speech interference threshold, a potentially significant impact. However, implementation of Mitigation Measures NOI-1 and NOI-2, which include administrative and source controls as well as coordination with school staff, would reduce this impact to a *less-than-significant* level.

**Tie-in Construction.** As shown in see Table 3.11-5, daytime construction noise levels at the tie-in locations are estimated to range between 49 to 91 dBA Leq at the closest locations, levels that exceed the 70-dBA speech interference threshold. Nighttime noise levels at tie-in locations (see Table 3.11-6) are estimated to range between 78 and 85 dBA (Leq) at the closest receptors (up to 90 dBA, Leq, combined); these levels would exceed the 60-dBA sleep disturbance threshold, a significant impact. Implementation of Mitigation Measure NOI-1, including administrative and source controls and Mitigation Measure NOI-3, providing alternative lodging for affected residents, would reduce this impact but not necessarily to a less-than-significant level. As a result, the impact of daytime and nighttime construction on noise levels at the tie-in locations would be *significant and unavoidable*.

**Nighttime Intersection Construction.** If required by encroachment permit conditions, construction through some street intersections may occur at night to avoid traffic impacts. Nighttime noise levels at these locations (see Table 3.11-6) are estimated to range between 76 and 88 dBA (Leq) at the closest receptors (up to 93 dBA, Leq, combined); these levels would exceed the 60-dBA sleep disturbance threshold, a significant impact. Implementation of Mitigation Measure NOI-1, including administrative and source controls and Mitigation Measure NOI-3, providing alternative lodging for affected residents, would reduce this impact but not necessarily to a less-than-significant level. As a result, the impact of nighttime construction on noise levels at the tie-in locations would be *significant and unavoidable*.

**Truck Traffic Increases on Local Roadways.** Noise levels generated by average haul/delivery truck traffic along haul/delivery routes would be approximately 59 dBA (Leq) at 50 feet. Compared to existing background noise levels, truck noise would not noticeably increase the noise exposure along collector residential streets like Richmond Street (Leq averaging 60 dBA), or along noisier corridors such as San Pablo Avenue (Leq averaging 70 dBA). Noise level increases would be noticeable when compared with ambient noise levels along quiet residential streets like Lynne Avenue, C Street, and Norvell Street (Leq averaging 50 dBA), but levels would not exceed the 70-dBA speech interference threshold; therefore, this impact would be *less than significant*. Mitigation Measure NOI-1 would restrict truck operations to the daytime weekday hours, which would further minimize the potential for disturbance from truck noise on local streets.

### *Central Pressure Zone Pipeline*

This section addresses both segments of the Central Pressure Zone Pipeline in El Cerrito/ Richmond and Richmond/San Pablo.

#### City of El Cerrito

**Construction of Central Pressure Zone Pipeline (El Cerrito/Richmond).** As shown in Table 3.11-5, noise levels along this pipeline alignment are estimated to range between 72 and 84 dBA (Leq) at the closest receptors (up to 89 dBA, Leq, combined), which would exceed the 70-dBA speech interference threshold at times over approximately 6 work days at any given receptor. While such noise levels would be sporadic and their effects noticeable at times to adjacent residents, this impact considered *less than significant* because these noise levels would affect any given receptor for less than 10 work days, or 2 weeks.[3] Implementation of Mitigation Measure NOI-1, which includes administrative and source controls, would further reduce the effects of construction noise.

Pipeline construction within 250 feet of school buildings, as shown in Table 3.3-4, could result in noise levels that exceed the 70-dBA speech interference threshold, a *potentially significant* impact. However, implementation of Mitigation Measures NOI-1 and NOI-2, which include administrative and source controls as well as coordination with school staff, would reduce this impact to a *less-than-significant* level for schools.

A nursing home (RN3 Loving Care, 917 Elm Street; see Table 3.3.4) is located approximately 275 feet from pipeline alignment. Since this home does not have a direct line-of-sight to the pipeline alignment (i.e. it is not located on the same street as the Project) and is located beyond 250 feet from the alignment, construction noise levels are not expected to exceed the 70-dBA speech interference threshold, a *less-than-significant* impact.

**Tie-in Construction.** As shown in see Table 3.11-5, daytime construction noise levels at the tie-in locations are estimated to range between 49 to 91 dBA Leq at the closest locations, (up to 93 dBA, Leq, combined), levels that exceed the 70-dBA speech interference threshold. Nighttime noise levels at tie-in locations (see Table 3.11-6) are estimated to range between 82 and 89 dBA (Leq) at the closest receptors (up to 93 dBA, Leq, combined); these levels would exceed the 60-dBA sleep disturbance threshold, a significant impact.

Implementation of Mitigation Measure NOI-1, including administrative and source controls and Mitigation Measure NOI-3, providing alternative lodging for affected residents, would reduce this impact but not necessarily to a less-than-significant level. As a result, the impact of daytime and nighttime construction on noise levels at the tie-in locations would be *significant and unavoidable*.

**Nighttime Intersection Construction.** If required by encroachment permit conditions, construction through some street intersections may occur at night to avoid traffic impacts. Nighttime noise levels at these locations (see Table 3.11-6) are estimated to range between 76 and

[3] Daycare facilities located adjacent to pipeline alignments would be subject to noise impacts similar to residential uses.

88 dBA (Leq) at the closest receptors (up to 93 dBA, Leq, combined); these levels would exceed the 60-dBA sleep disturbance threshold, a significant impact. Implementation of Mitigation Measure NOI-1, including administrative and source controls and Mitigation Measure NOI-3, providing alternative lodging for affected residents, would reduce this impact but not necessarily to a less-than-significant level. As a result, the impact of nighttime construction on noise levels at the tie-in locations would be *significant and unavoidable*.

**Truck Traffic Increases on Local Roadways.** Noise levels generated by average haul/delivery truck traffic along haul/delivery routes would be approximately 59 dBA(Leq) at 50 feet. Because most trucks would use moderately noisy corridors, such as San Pablo Avenue (Leq averaging 70 dBA), the noise increase would not be noticeable and would not exceed the 70-dBA speech interference threshold, a *less-than-significant* impact. Mitigation Measure NOI-1 would restrict truck operations to the daytime weekday hours, which would further minimize the potential for disturbance from truck noise on local streets.

### City of Richmond

**Construction of the Central Pressure Zone Pipeline (El Cerrito/Richmond and Richmond/ San Pablo).** As shown in Table 3.11-5, noise levels along these pipeline alignments are estimated to range between 67 and 88 dBA (Leq) at the closest residential receptors (up to 84 and 93 dBA, Leq, combined). While such noise levels would be sporadic and their effects noticeable at times to adjacent residents, the impact is considered *less than significant* because these noise levels would affect any given receptor for less than 10 works days, or 2 weeks.[4] Implementation of Mitigation Measure NOI-1, which includes such administrative and source controls, would further reduce the effects of construction noise.

Pipeline construction within 250 feet of school buildings, as shown in Table 3.3-4, could result in noise levels that exceed the 70-dBA speech interference threshold, a *potentially significant* impact. However, implementation of Mitigation Measures NOI-1 and NOI-2, which include administrative and source controls as well as coordination with school staff, would reduce this impact to a *less-than-significant* level for schools.

**Tie-in Construction.** As shown in see Table 3.11-5, daytime construction noise levels at the tie-in locations are estimated to range between 53 to 91 dBA Leq at the closest locations, (up to 94 dBA, Leq, combined), levels that exceed the 70-dBA speech interference threshold. Nighttime noise levels at tie-in locations (see Table 3.11-6) are estimated to range between 84 and 89 dBA (Leq) at the closest receptors (up to 94 dBA, Leq, combined); these levels would exceed the 60-dBA sleep disturbance threshold, a significant impact.

Implementation of Mitigation Measure NOI-1, including administrative and source controls and Mitigation Measure NOI-3, providing alternative lodging for affected residents, would reduce this impact but not necessarily to a less-than-significant level. As a result, the impact of daytime and nighttime construction on noise levels at the tie-in locations would be *significant and unavoidable*.

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4 Daycare facilities (i.e. Piccoli Preschool) located adjacent to pipeline alignments would be subject to noise impacts similar to residential uses

**Nighttime Intersection Construction.** If required by encroachment permit conditions, construction through some street intersections may occur at night to avoid traffic impacts. Nighttime noise levels at these locations (see Table 3.11-6) are estimated to range between 76 and 88 dBA (Leq) at the closest receptors (up to 93 dBA, Leq, combined); these levels would exceed the 60-dBA sleep disturbance threshold, a significant impact. Implementation of Mitigation Measure NOI-1, including administrative and source controls and Mitigation Measure NOI-3, providing alternative lodging for affected residents, would reduce this impact but not necessarily to a less-than-significant level. As a result, the impact of nighttime construction on noise levels at the tie-in locations would be *significant and unavoidable*.

**Truck Traffic Increases on Local Roadways.** Noise levels generated by average haul/delivery truck traffic along haul/delivery routes would be approximately 59 dBA (Leq) at 50 feet. Because most trucks would use collector streets such as 23rd Street (Leq averaging 60 dBA), and moderately noisy corridors such as San Pablo Avenue (Leq averaging 70 dBA), the noise increase would not be noticeable and would not exceed the 70-dBA speech interference threshold, a *less-than-significant* impact. Mitigation Measure NOI-1 would restrict truck operations to the daytime weekday hours, which would further minimize the potential for disturbance from truck noise on local streets.

### City of San Pablo

**Construction of Central Pressure Zone Pipeline (Richmond/San Pablo).** As shown in Table 3.11-5, noise levels along this pipeline alignment are estimated to range between 82 and 94 dBA (Leq) at the closest residential receptors (up to 99 dBA, Leq, combined), levels that would exceed the 70-dBA speech interference threshold at times over approximately 6 work days at any given receptor. While such effects would, at times, be noticeable to adjacent residents, the impact is considered *less than significant* because these noise levels would affect any given receptor for less than 10 works days, or 2 weeks. Implementation of Mitigation Measure NOI-1, which includes such administrative and source controls, would further reduce the effects of construction noise.

Pipeline construction within 250 feet of school buildings, as shown in Table 3.3-4, could result in noise levels that exceed the 70-dBA speech interference threshold, a potentially significant impact. However, implementation of Mitigation Measures NOI-1 and NOI-2, which include administrative and source controls as well as coordination with school staff, would reduce this impact to a *less-than-significant* level.

**Pipeline Creek Crossings.** The Central Pressure Zone Pipeline (Richmond/San Pablo) pipeline would cross Wildcat Creek and San Pablo Creek. The proposed pipeline would cross beneath Wildcat Creek using the jack and bore construction method. A pipe bridge would be constructed to pass over San Pablo Creek at one of two alternative locations.

Construction-related noise levels associated with proposed jack and bore construction are presented in Table 3.11-5 (near the bottom). As indicated in this table, the noisiest phase of jack and bore construction would occur during excavation and shoring of the jacking and receiving pits when impact or vibratory sheet pile drivers would be used. Noise levels as high as 91 dBA (Leq) would occur at the closest receptor to the receiving pit if impact sheet pile drivers are used to reinforce the pit walls. Since residential receptors are farther from the jacking pit, these estimated noise levels are considered the highest, or maximum, noise levels that would occur at the closest residential receptors to either pit at the Wildcat Creek pipeline crossing.

Construction of the jacking pits, operation of the power unit for the boring machine at the jacking pit, and repaving the pits would occur for up to 10 weeks, and noise levels from some types of equipment would exceed the 70-dBA speech interference threshold (as indicated in Table 3.11-5). Therefore, construction-related noise levels in the vicinity of the two pits in 23rd Street (at Wildcat Creek) would be significant. However, with implementation of Mitigation Measure NOI-2, which would reduce noise levels from the boring jack power unit, it is expected that residents would be subject to noise levels in excess of 70 dBA for less than 10 consecutive working days at a time during the 10-week period. Pit construction would generate noise levels over 70 dBA for less than 10 consecutive working days, while noise from the boring machine and jacking unit would not exceed 70 dBA with mitigation, and noise from repaving would not exceed 70 dBA. Since the boring machine would operate at the bottom of the pit, the pit walls would serve as a noise barrier and reduce noise levels at the closest receptors to below the 70-dBA speech interference threshold. With mitigation, the impact is considered *less than significant.*

Construction-related noise levels associated with construction of the pipe bridge would be lower because sheet pile drivers would not be used. Pier supports would be drilled rather than driven. As indicated at the bottom of Table 3.11-5, noise levels at pipe bridge supports (where most of the construction equipment would be located) are estimated to range between 62 and 69 dBA (Leq) at the closest residential receptors to either pipe bridge location, which would not exceed the 70-dBA threshold. In addition, the closest residential receptors would be subject to such noise increases for less than 10 consecutive work days. The impact is considered *less than significant.*

**Tie-in Construction.** As shown in see Table 3.11-5, daytime construction noise levels at the tie-in locations are estimated to range between 47 to 91 dBA Leq at the closest locations, (up to 89 dBA, Leq, combined), levels that exceed the 70-dBA speech interference threshold. Nighttime noise levels at tie-in locations (see Table 3.11-6) are estimated to range between 80 and 83 dBA (Leq) at the closest receptors (up to 89 dBA, Leq, combined); these levels would exceed the 60-dBA sleep disturbance threshold, a significant impact.

Implementation of Mitigation Measure NOI-1, including administrative and source controls and Mitigation Measure NOI-3, providing alternative lodging for affected residents, would reduce this impact but not necessarily to a less-than-significant level. As a result, the impact of daytime and nighttime construction on noise levels at the tie-in locations would be *significant and unavoidable*.

**Nighttime Intersection Construction.** If required by encroachment permit conditions, construction through some street intersections may occur at night to avoid traffic impacts. Nighttime noise levels at these locations (see Table 3.11-6) are estimated to range between 76 and 88 dBA (Leq) at the closest receptors (up to 93 dBA, Leq, combined); these levels would exceed the 60-dBA sleep disturbance threshold, a significant impact. Implementation of Mitigation

Measure NOI-1, including administrative and source controls and Mitigation Measure NOI-3, providing alternative lodging for affected residents, would reduce this impact but not necessarily to a less-than-significant level. As a result, the impact of nighttime construction on noise levels at the tie-in locations would be *significant and unavoidable*.

**Truck Traffic Increases on Local Roadways.** Noise levels generated by average haul/delivery truck traffic along haul/delivery routes would be approximately 59 dBA (Leq) at 50 feet. Because most trucks would use collector residential streets like 23rd Street or Road 20 (Leq averaging 60 dBA), and moderately noisy corridors such as San Pablo Avenue (Leq averaging 70 dBA), the noise increase would not be noticeable and would not exceed the 70-dBA speech interference threshold, a *less-than-significant* impact. Mitigation Measure NOI-1 would restrict truck operations to the daytime weekday hours, which would further minimize the potential for disturbance from truck noise on local streets.

**Mitigation Measure NOI-2: Additional Noise Attenuation Measures.**

The Noise Control Plan required by Mitigation Measure NOI-1 will also contain measures to reduce potential noise impacts on schools as well as reduce construction noise levels at the jack and bore pipeline crossing. These measures will include but not be limited to the following:

***Schools***

a. Coordinate with schools located within 250 feet of Project pipeline alignments to schedule construction activities in a manner that minimizes noise impacts on school activities to the extent feasible. The following list of schools within 250 feet of the Project will be confirmed during preparation of the Noise Control Plan.

- Willard Middle School (2425 Stuart Street, Berkeley)
- Windrush Elementary School (1800 Elm Street, El Cerrito)
- Keystone Montessori School (6639 Blake Street, El Cerrito)
- Harding School (7115 C Street, El Cerrito)
- St. John the Baptist School (11156 San Pablo Avenue, El Cerrito)
- Richmond High School (1250 23rd Street, Richmond)

***Jack and Bore Pipeline Crossing***

b. Noise barriers or enclosures will be used as necessary to ensure that noise from the boring jack power unit/generator does not exceed 70dBA (Leq) speech interference threshold for more than 10 consecutive work days at the closest noise-sensitive receptors.

**Mitigation Measure NOI-3: Nighttime Construction Measures.**

The Noise Control Plan required by Mitigation Measure NOI-1 will include a provision to provide alternative lodging for residents, if requested, that are adversely affected by nighttime pipeline tie-in construction or by nighttime construction at intersections when required by encroachment permit conditions; this measure would only be used if nighttime construction occurs. EBMUD will make a concerted attempt to notify residents located within 400 feet of potential nighttime project construction at least ten (10) days in advance.

Notified residents may request alternative lodging for the night(s) of the potential nighttime construction from EBMUD; alternative lodging will consist of a standard room at a hotel located within 6 miles of the affected residence or as close as feasible. Alternative lodging will be provided and approved by EBMUD the day before the known nighttime construction would occur, or sooner, based upon the types of construction activities that may occur during the nighttime hours (10:00 p.m. to 7:00 a.m.).

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**Impact 3.11-3: Construction activities could result in excessive groundborne vibration (applies to all pipelines).**

**Pipeline Construction.** Because of the close proximity of structures (commercial and residential) to pipeline alignments and construction work areas (as close as 7 feet from receptor to curb), vibration resulting from the operation of heavy earthmoving equipment during the excavation and pipe installation phase could exceed the cosmetic damage threshold at structures located less than 10 feet from heavy equipment, a potentially significant impact. In addition, if large (truck-mounted) vibratory compactors were operated during backfilling and paving operations in close proximity to structures, vibration levels could exceed the cosmetic damage threshold at distances of less than approximately 17 feet[5], a potentially significant impact. Implementation of Mitigation Measure NOI-4, which calls for vibration monitoring and using smaller vibratory compactors or non-compacting materials (i.e., some types of gravel) where needed, would reduce vibration impacts at the closest structures to a *less-than-significant* level.

**Pipeline Creek Crossings (Including Tie-in and Both Pipe Bridge Locations). Table 3.11-7** presents the estimated vibration levels that would be generated by construction of the two pipeline creek crossings and pits at tie-in locations. Vibration levels would range from 0.019 in/sec PPV at 70 feet to 3.266 in/sec PPV at 15 feet, depending on the type of equipment used and the distance to the closest structures. If impact sheet pile installation is employed to construct jack and bore pits and tie-in pits, vibration levels could exceed the 0.4 in/sec PPV cosmetic damage threshold at the closest structures (see Table 3.11-7), a potentially significant impact. Implementation of Mitigation Measure NOI-4, which requires the use of vibratory sheet pile drivers instead of impact sheet pile drivers for pit construction as well as compliance with performance standards, would reduce this impact to a *less-than-significant* level at all pit locations. Table 3.11-7 lists the range of vibration levels that would be generated by vibratory sheet pile installation. Since it is not expected that substantial subsurface obstructions would be encountered in the Wildcat Creek vicinity or tie-in locations vibration levels from vibratory sheet pile installation would likely fall in the lower range (i.e., levels would not exceed the cosmetic damage threshold) at the closest structures to jack and bore pits. As indicated in Table 3.11-7, vibration associated with operation of other types of equipment at tie-in locations would not exceed the 0.4 in/sec PPV cosmetic damage threshold, a *less-than-significant* impact.

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5 Vibratory sheet piling is a "continuous" source of vibration; therefore, for buildings within 50 feet of sheet piling activities at the jack and bore pits, the construction vibration threshold of 0.4 in/sec PPV (continuous) was applied to determine impact significance, except in areas with High to Very High liquefaction susceptibility (see Figure 3.7-4 for the USGS liquefaction susceptibility maps, and Table 3.11-4 for vibration thresholds).

**TABLE 3.11-7**
**ESTIMATED CONSTRUCTION VIBRATION LEVELS**

| Pipeline and Closest Structure | Construction Activity | Construction Equipment with Potential to Generate Vibration that Could Cause Cosmetic or Structural Damage | Reference Vibration Level, in/sec PPV at 25 feet[a] | Vibration Level Adjusted For Distance | Impact 3.11-3 Exceeds 0.5 in/sec PPV Cosmetic Damage Threshold for Impact Vibration? | Impact 3.11-3 Exceeds 0.4 in/sec PPV Cosmetic Damage Threshold for Continuous Vibration? | Impact 3.11-3 Significance Determination |
|---|---|---|---|---|---|---|---|
| ***Open Trench Pipeline Construction*** | | | | | | | |
| *All Pipelines* | | | | | | | |
| Closest structures | Excavation and | Earthmoving Equipment | 0.089 | 0.191 | - | Yes | **SM** |
| to Pipeline | Pipe Installation | Loaded Trucks | 0.076 | 0.300 | - | No | LS |
| Alignments | Backfill and Repaving | Vibratory Compactor | 0.210 | 1.417 | - | Yes | **SM** |
| ***Jack-and-Bore and Tie-in Construction*** | | | | | | | |
| *Wildcat Creek Crossing (San Pablo) and All Pipeline Tie-ins* | | | | | | | |
| Closest structure to | Pit Excavation | Impact Sheetpile Driver-Upper Range OR | 1.518 | 3.266 | Yes | - | **SM** |
| Southerly Receiving | | Impact Sheetpile Driver-Low Range | 0.644 | 1.386 | Yes | - | **SM** |
| Pit (15 feet) and closest | | Vibratory Sheetpile Driver-Upper Range OR | 0.734 | 1.579 | - | Yes | **SM** |
| structure to Creek | | Vibratory Sheetpile Driver-Lower Range | 0.170 | 0.366 | - | No | LS |
| Crossing Tie-in Pits | | Earthmoving Equipment | 0.089 | 0.191 | - | No | LS |
| (18 feet) | | Loaded Trucks | 0.076 | 0.164 | - | No | LS |
| | Repaving | Vibratory Compactor | 0.210 | 0.452 | - | Yes | **SM** |
| | | Jumping Jack Vibratory Compactor | 0.035 | 0.075 | - | No | LS |
| ***Pipe Bridge Construction*** | | | | | | | |
| *San Pablo Creek Crossing (San Pablo)* | | | | | | | |
| Closest structure to either pipe bridge | Excavation | Caisson Drilling | 0.089 | 0.019 | - | No | LS |
| ***Tie-in Construction*** | | | | | | | |
| *Wildcat Pipeline Tie-ins (Berkeley)* | | | | | | | |
| Closest residential receptors | Pipe Connection | Earthmoving Equipment | 0.089 | 0.124 | - | No | LS |
| on: Parkside and Dana | | Loaded Trucks | 0.076 | 0.106 | - | No | LS |
| *Wildcat Pipeline Tie-ins (El Cerrito)* | | | | | | | |
| Closest residential receptors | Pipe Connection | Earthmoving Equipment | 0.089 | 0.068 | - | No | LS |
| 40 feet from north tie-in | | Loaded Trucks | 0.076 | 0.058 | - | No | LS |
| and 30 feet from south tie-in | | | | | | | |

**TABLE 3.11-7 (Continued)**
**ESTIMATED CONSTRUCTION VIBRATION LEVELS**

| Pipeline and Closest Structure | Construction Activity | Construction Equipment with Potential to Generate Vibration that Could Cause Cosmetic or Structural Damage | Reference Vibration Level, in/sec PPV at 25 feet[a] | Vibration Level Adjusted For Distance | Impact 3.11-3 Exceeds 0.5 in/sec PPV Cosmetic Damage Threshold for Impact Vibration? | Impact 3.11-3 Exceeds 0.4 in/sec PPV Cosmetic Damage Threshold for Continuous Vibration? | Impact 3.11-3 Significance Determination |
|---|---|---|---|---|---|---|---|
| ***Tie-in Construction*** | | | | | | | |
| *Central Pressure Zone Pipeline Tie-ins (El Cerrito)* | | | | | | | |
| Closest residential receptors with direct line-of-sight located 125 feet from north tie-in and 250 feet from south tie-in | Pipe Connection | Earthmoving Equipment | 0.089 | 0.068 | - | No | LS |
| | | Loaded Trucks | 0.076 | 0.058 | - | No | LS |
| *Central Pressure Zone Pipeline Tie-in (Richmond)* | | | | | | | |
| Closest residential receptor at 404 23rd Street | Pipe Connection | Earthmoving Equipment | 0.089 | 0.124 | - | No | LS |
| | | Loaded Trucks | 0.076 | 0.106 | - | No | LS |
| *Central Pressure Zone Pipeline Tie-in (San Pablo)* | | | | | | | |
| Closest residential receptors at 2028, 2029, 2100, and 2101 Road 20 | Pipe Connection | Earthmoving Equipment | 0.089 | 0.044 | - | No | LS |
| | | Loaded Trucks | 0.076 | 0.038 | - | No | LS |

NOTES: Vibration levels in **BOLD** indicate a significant impact because they exceed the threshold for either impact or continuous vibration for cosmetic damage. "SM" indicates the impact would be significant but could be mitigated to a less-than-significant level with specified mitigation measures. "LS" indicates a less-than-significant impact, and no mitigation would be required.

[a] Reference vibration levels are based on vibration data provided by the Federal Transit Administration (FTA, 2006). For distances applied in this analysis to each vibration source at each receptor location, see Table I-8 in Appendix I.

**Vibration-Induced Liquefaction Effects.** The use of vibratory equipment could cause vibration-induced liquefaction in areas with High to Very High liquefaction susceptibility and result in differential settlement at adjacent or nearby structures. The estimated peak ground acceleration (PGA) threshold at these areas is as follows:0.1 g for areas mapped as "Qhc," "Qhly," and "Qhty," and greater than 0.2 g for areas mapped as "Qhf" (USGS, 2006). Since the vibratory construction equipment would typically generate vibration near 30 Hz (1,800 revolutions per minute) and lower, the corresponding peak vibration velocity thresholds for this effect are 0.205 in/sec PPV for 0.1 g PGA and 0.410 in/sec PPV for 0.2 g PGA. Given the proximity of the construction activities to nearby structures, vibratory construction activities along 23rd Street, from about Market Avenue to Road 20 (the northernmost portion of the Central Pressure Zone Pipeline), could generate differential settlement if vibration activities exceeded the 0.205 in/sec PPV for 0.1 g PGA and 0.410 in/sec PPV for 0.2 g PGA thresholds – a potentially significant impact. However, with implementation of the vibration limits specified in Mitigation Measure NOI-4, potential vibration-induced liquefaction effects would be reduced to a *less-than-significant* level.

A small area of artificial fill near the Pacific East Mall (3288 Pierce Street), which also has a Very High liquefaction susceptibility, is located approximately 1,400 feet southwest of the southernmost terminus of the Central Pressure Zone Pipeline in El Cerrito. At this distance from the Central Pressure Zone Pipeline work area, the potential for differential settlement resulting from construction-related vibration would be minimal, and the impact would be *less than significant*.

While vibratory sheet pile installation, as required in Mitigation Measure NOI-4, would ensure that vibration levels do not exceed the 0.4 in/sec PPV cosmetic damage threshold for continuous vibration at the closest structures, vibratory construction activities could cause vibration-induced liquefaction in areas with High to Very High liquefaction susceptibility, thus resulting in differential settlement at adjacent or nearby structures. Both jack and bore pits are located in areas underlain with alluvial and stream deposits, which have a High to Very High liquefaction susceptibility (see Figure 3.7-4). Given the proximity of jack and bore pits (particularly the southerly receiving pit) to nearby structures, vibratory construction activities in areas with High to Very High liquefaction susceptibility could generate differential settlement if vibration activities exceeded the 0.205 in/sec PPV for 0.1 g PGA and 0.410 in/sec PPV for 0.2 g PGA thresholds – a potentially significant impact. However, with implementation of the vibration limits specified in Mitigation Measure NOI-4, potential vibration-induced liquefaction effects would be reduced to a *less-than-significant* level.

**Truck Traffic Increases on Local Roadways.** Vibration levels associated with the operation of loaded trucks on local roadways are estimated to range between 0.3 in/sec at 10 feet and 0.038 at 40 feet (Table 3.11-7). Such vibration levels would not exceed the 0.4 in/sec PPV threshold for cosmetic damage from continuous vibration. In addition, implementation of construction time limits under Mitigation Measure NOI-1 would help reduce the adverse effects of construction truck-related vibration to *less than significant*.

**Mitigation Measure NOI-4: Vibration Limits.**

Construction practices will be utilized that do not generate vibration levels at the closest structures above the following thresholds:

| Category | Maximum Amplitude |
|---|---|
| Cosmetic Damage – Residential and Commercial Buildings | |
| Transient or Intermittent Sources | 0.5 in/sec PPV |
| Continuous Vibratory Sources | 0.4 in/sec PPV |
| All Vibratory Sources Located in Areas of Very High Liquefaction Susceptibility, as Depicted in Figure 3.7-4 | 0.1 g (peak acceleration), or 0.2 in/sec PPV at 30 Hz |

The following measures, at a minimum, will be employed to ensure these thresholds are met:

***Pipeline, Tie-in, and Creek Crossing Construction***

a. Vibration monitoring will be conducted for the first 500 feet of pipeline construction for each segment to confirm vibration levels do not exceed the above vibration thresholds. If vibration levels exceed the limits of this mitigation measure, then construction practices will be modified (i.e. use smaller types of construction equipment, operate the equipment in a manner to reduce vibration, or use alternate construction methods), and monitoring will continue for an additional 200 feet or until construction practices meet the required vibration levels. The monitoring in this mitigation measure will be repeated if the construction methods change in a manner that would increase vibration levels, or when structures are closer to the limits of construction than previous vibration monitoring have confirmed is below the vibration thresholds.

b. Smaller vibratory compactors and/or non-compacting materials (i.e., some types of gravel) will be used to minimize vibration levels during repaving activities where needed to meet vibration limits.

c. Sheet piles will be installed with vibratory drivers instead of impact drivers where feasible. Impact sheet pile installation will be prohibited within 55 feet of the closest structures. Vibration monitoring will be conducted within 100 feet of any buildings where impact sheet pile installation occurs, and within 60 feet of any building where vibratory sheet pile installation occurs to ensure that the above applicable performance standard is not exceeded. If vibration levels exceed the applicable threshold, the contractor will use alternative construction methods.

d. For the pipe bridge supports, pile holes will be pre-drilled to minimize or avoid the use of impact pile drivers.

***Areas Susceptible to High/Very High Liquefaction Hazards***

e. Soil settlement and vibration monitoring will be conducted at the closest structures when vibratory equipment is operated in areas with High to Very High liquefaction susceptibility to ensure that the above performance standard is not exceeded.

***Preconstruction Surveys and Monitoring***

f. With permission and at the request of homeowners, EBMUD will conduct a preconstruction survey of homes, other sensitive structures, hardscaping, hillsides, and slide areas adjacent to the pipeline alignments, for potential effects due to vibration-generating activities. EBMUD will respond to any claims by inspecting the affected property promptly. Any new cracks or other changes in structures will be compared to preconstruction conditions and a determination made as to whether the proposed Project could have caused such damage. In the event that the Project is demonstrated to have caused the damage, the EBMUD will coordinate with the owner to have the damage repaired to the pre-existing condition.

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**Impact 3.11-4: Project operations would not result in a substantial permanent increase in ambient noise levels in the project vicinity or significant impacts related to the exposure of people to noise levels in excess of local noise ordinance limits (applies to all pipelines).**

The primary sources of noise typically associated with the operation of water facilities include pumps and electrical facilities (substations, transformers, and emergency generators). The proposed Project does not include any such noise sources. Following the completion of Project improvements, pipeline operations would be similar to operations for other existing pipelines operated by EBMUD (i.e., flushing, hydrant testing, anode replacement every 25 years, leak detection, leak repair, right-of-way maintenance). These maintenance activities would occur as needed or as part of routine of facility monitoring in accordance with standard inspection schedules, and the frequency of monitoring or maintenance activities would not change substantially from current conditions. The Project would not result in any permanent surface operations that would introduce new sources of noise or vibration; therefore, the impact related to potential increases in operational noise or vibration would *less than significant*.

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# 3.12 Recreation

This section evaluates the potential impacts on recreational resources associated with implementation of the proposed West of Hills Northern Pipelines Project. This analysis addresses publicly accessible recreational resources in the vicinity of the West of Hills Northern Pipelines Project. Potential impacts to bicycle facilities are addressed in Section 3.13, Transportation and Traffic.

## 3.12.1 Setting

The proposed pipelines would be located within developed urban areas of the city of Berkeley in Alameda County and the cities of El Cerrito, Richmond, and San Pablo in Contra Costa County. Recreational resources of these cities consist of neighborhood parks, greenbelts, and public amenities. Recreational resources adjacent to the proposed alignments are described below.

### Local Parks and Recreational Facilities

#### *City of Berkeley*

A narrow greenbelt (approximately 30 to 40 feet wide) runs between The Uplands and Parkside Drive from Encina Place to Plaza Drive in the city of Berkeley. The greenbelt includes a walking path with a variety of native and non-native mature trees.

Willard Park is located at the corner of Hillegass Avenue and Derby Street. This is the main neighborhood park in Southeast Berkeley and includes a large grassy area, clubhouse, tot lot play area, picnic area, an adjacent swim center, two tennis courts, and picnic area (City of Berkeley, 2013).

#### *City of El Cerrito*

Harding Park is located at C Street and Ashbury Avenue in the city of El Cerrito and is classified as neighborhood-serving park in the *of El Cerrito General Plan* (City of El Cerrito, 1999). The park is approximately 3.5 acres in size and includes tennis courts, a baseball diamond, a jungle gym/playground, a grassy picnic area with barbecue facilities and a recreational clubhouse (City of El Cerrito, 2012).

#### *City of San Pablo*

Kennedy Plaza is located adjacent to San Pablo Creek near the intersection of Brookside Drive and 23rd Street in the city of San Pablo. Kennedy Plaza includes a green strip that runs for approximately 200 yards between San Pablo Creek and Brookside Drive as well as a small grassy area and concrete plaza with sitting benches, a small fountain with an architectural façade, pergola and ornamental landscaping.

A pocket park is located west of 23rd Street on the north side of Wildcat Creek. The park includes a pedestrian walkway, park benches and interpretive signage. The park is part of the Wildcat Creek Trail Project, which includes restoration of creek habitat, bank stabilization and a new paved pedestrian/bicycle trail along the north bank of Wildcat Creek to connect 23rd Street to John Hubert Davis Park.

## 3.12.2 Regulatory Setting

### Federal Regulations

There are no federal regulations or requirements pertaining to recreational resources or facilities that are applicable to the proposed West of Hills Northern Pipelines Project.

### State Regulations

There are no state regulations or requirements pertaining to recreational resources or facilities that are applicable to the proposed West of Hills Northern Pipelines Project.

### Local Policies

At the local level, recreational facilities are addressed through implementation of general plan policies, which provide guidelines for preserving and enhancing the recreational facilities in the affected cities. It is EBMUD practice to work closely with host jurisdictions and the neighboring communities during project planning and to conform to local land use plans and policies to the extent practical.

The *City of Berkeley General Plan* (City of Berkeley, 2001) contains several policies related to recreational facilities. Policy OS-1 requires existing open space and parks to be maintained and preserved for public park and open space use. Policy OS-4 calls for coordination with other agencies, including EBMUD, to improve, preserve, maintain and renovate open space and recreation facilities. Policy EM-29 requires the maintenance, enhancement and preservation of street and park trees. Policy UD-9 requires that any tree replacement maintain historic planting patterns and native species consistent with the City of Berkeley 1990 Street Tree Policy.

The City of Berkeley also has a tree protection ordinance (No. 6,905-N.S.) that protects coast live oaks, specifically single-stem trees with a circumference of 18 inches at 4 ft above ground level, or multiple-stemmed trees with an aggregate circumference of 26 inches.

The *City of El Cerrito General Plan* (City of El Cerrito, 1999) policy PR1.15 states that development should not denigrate or interfere with the use or enjoyment of city-owned park, recreational, and open space facilities.

The City of San Pablo's *General Plan 2030* (City of San Pablo, 2011) guiding policy PSCU-G-1 states that the City of San Pablo will provide an expanded, high quality, and diversified park system for the entire community. Policy OSC-I-10 requires the maintenance, protection and enhancement of San Pablo and Wildcat creeks as local environmental and aesthetic resources.

The City of Richmond's *General Plan 2030* Action PR1.G requires at least a 1:1 replacement if there is any loss of public open space or parkland due to development or redevelopment in order to prevent a net loss of parklands in the city of Richmond.

# 3.12.3 Impacts and Mitigation Measures

## Significance Criteria

The proposed Project would not result in impacts addressed by the standards of significance identified in CEQA Guidelines Appendix G for Recreation. The proposed Project does not include any recreational facilities, nor would the Project increase the use of existing recreational facilities. Accordingly, EBMUD developed the following standards of significance for the West of Hills Northern Pipelines Project, which is considered to have a significant impact if it would:

- Substantially disrupt access to parks and other recreational facilities
- Damage or remove elements of parks or other recreational facilities (including trees and other vegetation)

### *Methodology*

The evaluation of impacts on recreational resources focuses on the potential construction to disrupt access or damage recreational resources in the project vicinity. To determine the potential for construction activities to cause direct effects on recreation, the proposed construction areas were compared to the locations of identified recreational resources and facilities. Site visits, local planning documents and maps, local street maps, and electronic maps available via the Internet were reviewed to identify the recreational resources in the project vicinity.

During future project operations, the West of Hills Northern Pipelines Project would not affect established recreational resources or uses because nearly all of the facilities associated with the Project would be underground and would operate in a manner that could not affect access to, or use of, any recreational resources.

## Impacts and Mitigation Measures

**Impact 3.12-1: Construction of the Project may disrupt access to parks and other recreational facilities (Wildcat Pipeline [Berkeley], Wildcat Pipeline [El Cerrito], Central Pressure Zone Pipelines [Richmond/San Pablo]).**

#### Wildcat Pipeline (Berkeley)

Construction of the Wildcat Pipeline (Berkeley) would temporarily disrupt access to a portion of the park strip between Parkside Drive and The Uplands. Trenching and pipeline installation activities would last approximately one to two weeks within the park strip and construction of the tie-in at Parkside Drive and Nogales Street would last up to two and a half weeks. During this time, recreationists using the park strip would be able to detour around the construction area via the sidewalks on The Uplands or Parkside Drive and would then be able to access the park strip after passing the construction zone. Because construction activity would cause a temporary disruption of access to a small portion of the park strip and recreational uses would be able to continue on either side of the construction zone, this impact would be *less than significant*.

In addition, construction of the Wildcat Pipeline would temporarily disrupt access to Willard Park, located at the corner of Hillegass Avenue and Derby Street. In the vicinity of Willard Park, pipeline construction activities for the segment between Parker Street and Dana Street to Hillegass Avenue and Stuart Street would last approximately 3 to 6 weeks. The duration of pipeline installation activities between Hillegass Avenue and Stuart Avenue and Hillegass Avenue and Russell Street would last approximately one to two weeks. During these construction periods, recreationists using Willard Park would still have access to the park via the sidewalks on Derby Street and Hillegass Avenue (north of the park). Because recreational uses would still remain available during pipeline construction activities, this impact would be *less than significant.*

#### Wildcat Pipeline (El Cerrito)

Construction of the Wildcat Pipeline (El Cerrito) would pass in front of the entrance to Harding Park along C Street. Trenching and pipeline installation activities in front of the park would last approximately one to two weeks. During construction, access to Harding Park would remain open, however, recreational activities could be disrupted by construction-related noise and/or dust. Memorial Park, located approximately one half mile south of Harding Park, offers similar facilities and would also be available to recreationists during construction activities. Because access to Harding Park would remain open, and recreationists would be able to utilize alternate nearby facilities, this impact is considered *less than significant*.

#### Central Pressure Zone Pipeline (Richmond/San Pablo)

As described in Chapter 2, Project Description, the jacking pit for construction of the Central Pressure Zone Pipeline (Richmond/San Pablo) would be located within the City of San Pablo's pocket park adjacent to 23rd Street and Wildcat Creek. The jack and bore process would take up to ten weeks and would require temporary closure of the pocket park, causing temporary disruption of recreational activities associated with the park. During construction, recreationists would be able to use nearby facilities such as John Hubert Davis Park (located approximately 0.2 miles west of the park) which offers similar amenities. Because disruption in access would be temporary and alternate nearby facilities are available, this impact would be *less than significant*.

Construction of the San Pablo Avenue Option of the Central Pressure Zone Pipeline (Richmond/San Pablo) would also pass in front of Kennedy Plaza. Access to Kennedy Plaza would not be closed; however, recreational activities in the park could be affected by construction related noise or dust. As described above, recreationists would be able to use nearby facilities such as John Hubert Davis Park (located approximately 0.2 miles west of Kennedy Plaza) which offers similar amenities. Because disruption of recreational activities would be temporary and alternate nearby facilities are available, this impact would be *less than significant*.

**Impact 3.12-2: Construction of the Project may result in the removal of trees and other park facilities (Wildcat Pipeline [Berkeley] and Central Pressure Zone Pipeline [Richmond/San Pablo]).**

### Wildcat Pipeline (Berkeley)

A short segment of the Wildcat Pipeline (Berkeley) would be constructed within the park strip between The Uplands and Parkside Drive. The pipeline and construction corridor would be located to minimize impacts to trees; however, construction would require the removal of approximately two trees and the trimming of the limbs and roots of additional trees located within the public right-of-way. Mature trees and native oaks would be avoided to the extent practical. As seen from adjacent locations, the tree removal would be a noticeable change. However, because a substantial number of mature trees would remain along the greenbelt, it is expected that the tree removal associated with the proposed pipeline construction would be an incremental change that would not substantially disrupt recreational uses of the greenbelt or substantially damage the area. Mitigation Measure AES-2, in Section 3.2, Aesthetics, requires that EBMUD plant replacement trees for any trees removed during construction. With implementation of this mitigation measure, this impact would be *less than significant*.

### Central Pressure Zone Pipeline (Richmond/San Pablo)

Jack and bore activities could result in temporary removal of trees or amenities at the proposed pocket park adjacent to 23rd Street on the north side of Wildcat Creek, which could negatively affect the park facility. Mitigation Measure REC-1 below ensures restoration of the park to pre-project conditions after completion of construction activities. With implementation of this mitigation measure, impacts to this park would be *less than significant*.

As shown in Figure 2-9 of Chapter 2, *Project Description*, the Central Pressure Zone Pipeline (Richmond/San Pablo) would cross San Pablo Creek by pipe bridge at one of two alignments – the proposed alignment utilizes an existing EBMUD utility corridor between Brookside Drive and Road 20 in San Pablo, while the San Pablo Avenue Option would be developed in the park at Kennedy Plaza owned by the City of San Pablo. The proposed Project would require tree removal within the EBMUD properties regardless of where the pipe bridge is built, to protect an existing pipeline in the corridor. In addition, construction and maintenance of the utility corridor may require the trimming of trees that are located on adjacent properties but have limbs and roots within the EBMUD-owned properties. Impacts to adjacent trees would be avoided to the extent practical.

Vegetation within and adjacent to the EBMUD utility corridor between Brookside Drive and Road 20 is dense, with a fully developed canopy. In addition, the proposed alignment is bordered by private property along Road 20 and is fenced along Brookside Drive, and is therefore not accessible as a recreational facility to the public. It is likely that after construction, the remaining vegetation surrounding the utility corridor would grow in to screen view of the area around the pipe bridge so that tree removal would not be noticeable from Kennedy Plaza. Therefore, tree removal is not expected to result in permanent disruption of recreational activities or damage to Kennedy Plaza and this impact is considered to be *less than significant*.

Vegetation within the vicinity of the San Pablo Avenue Option alignment adjacent to San Pablo Avenue consists mainly of low growing shrubs and herbaceous vegetation. One large California Buckeye and one white alder, located on the southern bank of San Pablo Creek are within the proposed construction area and would likely be removed. Removal of these trees would potentially result in a noticeable change the character of Kennedy Plaza. Per Mitigation Measure BIO-1d, EBMUD would be required to prepare and implement a vegetation restoration plan to provide mitigation for any tree removal. Implementation of the vegetation restoration plan would restore the character of the area affected by tree removal, and reduce this impact to *less than significant*.

**Mitigation Measure REC-1: Restoration of 23rd Street Pocket Park.**

If the jack and bore pit required for the Central Pressure Zone Pipeline (Richmond/San Pablo) crossing of Wildcat Creek is located in the City of San Pablo's park adjacent to 23rd Street, the pit and construction activities will be located to avoid trees to the extent feasible. After completion of construction activities, the park will be restored to pre-project conditions. Restoration will include replanting any trees or other vegetation and replacing any other park amenities (park benches, sidewalks, signage etc) that were removed during construction. To allow for access to the pipeline, replanted trees will not be located within 20 feet of the pipeline.

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# 3.13 Transportation and Traffic

This section provides an assessment of the temporary traffic impacts associated with constructing the West of Hills Northern Pipelines Project (proposed Project). This section identifies the network of roads (regional and local), transit service, and bicycle/pedestrian facilities in the project area and how project construction could affect the operation of the transportation system along each of corridors of the four segments. This analysis is based on implementation of the conceptual traffic control plan (traffic handling schemes and detour routing) described in Section 2.8.

## 3.13.1 Setting

The study area for transportation and traffic includes a network of regional and local roadways that would be used for access by construction worker vehicles and other construction vehicles, including trucks that would transport construction materials and equipment, excavated spoils, and fill materials to and from the work areas.

### Regional Access

Various state and interstate highways provide regional access to the project area and connect to the local roadway network. These regional roadways are described for each proposed segment and optional routes below.

**Interstate 80 (I-80)** is a north-south freeway that travels along the San Francisco Bay and provides regional access to multiple communities within Alameda and Contra Costa Counties. In the project area, the roadway generally has ten lanes, and according to the most recent data published by Caltrans, the annual average daily traffic (AADT) on I-80 in the project area is about 167,000 to 262,000 vehicles (Caltrans, 2011). I-80 provides regional access to most of the proposed segments and optional routes.

**Interstate 580 (I-580)** is a north-south freeway in the western and the northern portions of Alameda and Contra Costa Counties and travels in an east-west direction in southern and eastern portions of Alameda County and provides regional access to numerous communities. In the project area, the roadway is generally a six-lane roadway, and according to the most recent data published by Caltrans, the AADT on I-580 in the project area is about 77,000 vehicles (Caltrans, 2011). I-580 provides regional access to the Wildcat Pipeline (El Cerrito), Central Pressure Zone Pipeline (El Cerrito), Central Pressure Zone Pipeline (Richmond/San Pablo), and San Pablo Avenue optional alignment.

**State Route 13 (SR 13)**, also known as Ashby Avenue, is an east-west arterial that extends from its junction at I-80 to the west in the city of Berkeley, to Claremont Avenue to the east, where it becomes Tunnel Road in the city of Oakland. In the project area, the roadway has two lanes that connect several neighborhoods within the city of Berkeley. According to the most recent data published by Caltrans, the AADT on SR 13 in the project area is about 20,000 vehicles (Caltrans, 2011). SR 13 provides regional access to the Wildcat (Berkeley) alignment and Benvenue Avenue optional alignment.

**State Route 24 (SR 24)** is an east-west highway that connects several communities within Contra Costa County to Oakland in Alameda County. In the project area, the roadway is generally an eight-lane roadway, and according to the most recent data published by Caltrans, the AADT on SR 24 in the project area is about 143,000 vehicles (Caltrans, 2011). SR 24 provides regional access to the Wildcat (Berkeley) alignment and Benvenue Avenue optional alignment.

**State Route 123 (SR 123)**, also known as San Pablo Avenue, is a north-south arterial that extends between the city of Oakland in the south to the city of Richmond in the north. In the project area, the roadway is a four-lane boulevard, and according to the most recent data published by Caltrans, the AADT on SR 123 in the project area is about 18,400 vehicles (Caltrans, 2011). SR 123 provides regional access to the Wildcat Pipeline (El Cerrito) and Central Pressure Zone Pipeline (Richmond/San Pablo) alignments.

## Local Access

The project area is served by a network of roads with various purposes: "arterials," designed to carry traffic through an area; "collectors," designed to connect arterials to local roads and land uses; and "local roads," which provide direct access to land uses. Descriptions of roadways that could be affected by construction and operation of each proposed segment are presented in **Table 3.13-1**.

Existing average daily traffic volumes (ADT) were obtained from the Cities of San Pablo, Richmond, and El Cerrito, as well as through collection of new data specifically for this Project. All of the traffic counts used for the analysis are from May 2010 or later. The majority of the traffic counts were conducted by Wiltec in April 2012. A comparison of the recent traffic counts with the older traffic counts conducted in the past three years indicates no growth in traffic, which is consistent with the performance of the state's economy.

### *Public Transit*

As shown in **Table 3.13-2** there are multiple local Alameda-Contra Costa Transit District (AC Transit) fixed-bus routes that serve the project area. The descriptions and scheduled frequency of each service transit route are also described.

### *Bicycle and Pedestrian Facilities*

#### Pedestrian Facilities

Pedestrian facilities generally include sidewalks, crosswalks, curb ramps, pedestrian signals, and streetscape amenities. Because the project area and the environs of each proposed pipeline segment are located in and around urban roadways and within a built-out, urban environment, pedestrian facilities throughout the project area are generally developed with raised, concrete sidewalks,

**TABLE 3.13-1**
**CHARACTERISTICS OF ROADWAYS IN THE PROJECT AREA**

| Roadway / Segment | No. of Lanes / Road Width[a] | Traffic Volumes[b] | Bike Lanes? | On-Street Parking Permitted?[c] | Public Transit Lines? |
|---|---|---|---|---|---|
| **Wildcat Pipeline (Berkeley)** | | | | | |
| Dana Street: ▪ Parker Street to Ward Street | Two lanes (36 feet) | 770 vpd | No | Yes, both sides (RPP Zone J) | No |
| Ward Street ▪ Dana Street to Telegraph Avenue | Two lanes (36 feet) | 1,100 vpd | No | Yes, both sides (RPP Zone J) | No |
| Telegraph Avenue ▪ Ward Street to Stuart Street | Four lanes (67 feet) | 18,000 vpd | Yes, Class II both sides | Yes, both sides (metered) | Yes, AC Transit Bus (1, 1R) |
| Stuart Street ▪ Telegraph Avenue to Hillegass Avenue | Two lanes (36 feet) | 1,950 vpd | No | Yes, both sides (RPP Zone B) | No |
| Hillegass Avenue ▪ Stuart Street to Woolsey Street | Two lanes (36 feet) | 1,550 vpd | Yes, Class III both sides | Yes, both sides (RPP Zones A, B) | No |
| Woolsey Street ▪ Hillegass Avenue to Claremont Avenue/ Uplands | Two lanes (36 feet) | 764 vpd | Yes, Class III both sides | Yes, both sides (RPP Zones A, L) | No |
| Claremont Avenue • Woolsey Street to The Uplands | Four lanes (56 feet) | 12,600 vpd | No | Yes, both sides | Yes, AC Transit Bus (49, E) |
| The Uplands ▪ Claremont Avenue to median crossing | Two lanes (30-56 feet) | 1,850 vpd | No | Yes, both sides (RPP Zone L) | No |
| Parkside Drive • Median crossing to Nogales Street | Two lanes (28 feet) | 800 vpd | No | Yes, north side | No |
| **Wildcat Pipeline (Berkeley) - *Benvenue Option*** | | | | | |
| Stuart Street ▪ Hillegass Avenue to Benvenue Avenue | Two lanes (36 feet) | 1,950 vpd | No | Yes, both sides (RPP Zone B) | No |
| Benvenue Avenue ▪ Stuart Street to Woolsey Street | Two lanes (36 feet) | 860 vpd | No | Yes, both sides (RPP Zones A, B; intermittent metered) | No |
| **Wildcat Pipeline (El Cerrito)** | | | | | |
| Hill Street: ▪ Liberty Street to Elm Street | Two lanes (36 feet) | 2,050 vpd | Yes, Class III both sides | Yes, both sides | No |
| Elm Street: ▪ Hill Street to Richmond Street | Two lanes (40 feet) | 6,750 vpd | Yes, Class III both sides | Yes, both sides | No |
| Richmond Street: ▪ Elm Street to Lincoln Avenue | Two lanes (30 to 40 feet) | 6,250 vpd | Yes, Class III both sides | Yes, both sides | Yes, AC Transit Bus (G) |
| Lincoln Avenue: ▪ Richmond Street to Norvell Street | Two lanes (30 feet) | 1,000 vpd | No | Yes, both sides | No |
| Norvell Street ▪ Lincoln Avenue to Fairmount Avenue | Two lanes (28 feet) | 1,000 vpd | No | Yes, both sides | No |

**TABLE 3.13-1 (Continued)**
**CHARACTERISTICS OF ROADWAYS IN THE PROJECT AREA**

| Roadway / Segment | No. of Lanes / Road Width[a] | Traffic Volumes[b] | Bike Lanes? | On-Street Parking Permitted?[c] | Public Transit Lines? |
|---|---|---|---|---|---|
| Wildcat Pipeline (El Cerrito) (cont.) | | | | | |
| Fairmount Avenue<br>▪ Norvell Street to Behrens Street | Two lanes (40 feet) | 8,720 vpd | No | Yes, both sides | Yes, AC Transit Bus (G, 25) |
| Behrens Street<br>▪ Fairmount Avenue to C Street | Two lanes (30 feet) | 1,000 vpd | No | Yes, both sides | No |
| C Street<br>▪ Behrens Street to Ashbury Avenue | Two lanes (26 feet) | 1,000 vpd | No | Yes, both sides | No |
| Ashbury Avenue:<br>▪ C Street to Lynn Avenue | Two lanes (78 feet) | 4,070 vpd | No | Yes, both sides | No |
| Lynn Avenue:<br>▪ Ashbury Avenue to San Carlos Avenue | Two lanes (36 feet) | 1,000 vpd | No | Yes, both sides | No |
| Central Pressure Zone Pipeline (El Cerrito/Richmond) | | | | | |
| San Pablo Avenue (SR 123):<br>▪ Nevin Avenue to Central Avenue | Four lanes* (78 feet) | 22,000 vpd | No | Yes, intermittent unrestricted and metered on both sides | Yes, multiple AC Transit Bus (7,72, 72M, 72R, 76, 376 L, LC, 800) |
| Central Pressure Zone Pipeline (Richmond/San Pablo) | | | | | |
| Brookside Drive:<br>▪ 21st Street to 23rd Street | Two lanes (40 feet) | 3,200 vpd | No | Yes, intermittent unrestricted on both sides | No |
| 23rd Street<br>▪ Brookside Drive to Maricopa Ave/Costa Ave | Three lanes (52 feet) | 15,600 vpd | Yes, Class II both sides | Yes (intermittent) | Yes, AC Transit Bus (74) |
| 23rd Street<br>• Maricopa Ave/Costa Ave to Brooks Avenue | Four lanes (62 feet) | 25,100 vpd | No | Yes (intermittent) | Yes, AC Transit Bus (74) |
| 23rd Street<br>• Brooks Ave to Nevin Ave | Three lanes NB only (56 feet) | 14,300 vpd | No | Yes (intermittent) | Yes, AC Transit Bus (74) |
| Central Pressure Zone Pipeline (Richmond/San Pablo) – *San Pablo Avenue Option* | | | | | |
| 23rd Street:<br>▪ Brookside Drive to San Pablo Avenue | Four lanes (64 feet) | 18,800 vpd | Yes | No | Yes, AC Transit Bus (74) |
| San Pablo Avenue:<br>▪ 23rd Street to Road 20 | Five lanes (86 feet) | 23,400 vpd | No | No | Yes, AC Transit Bus (74) |

NOTES:
a Roadway widths (curb-to-curb) are presented in approximate feet.
b Existing traffic volume represents average daily traffic (ADT); vpd = vehicles per day
c RPP = residential parking permit (City of Berkeley only). Unrestricted = no residential parking permit required.
* San Pablo Avenue (SR 123) includes four general purpose lanes (two in both directions); however, roadway includes multiple left-turn pocket lanes at the majority of intersections.
** NB = northbound

SOURCES: ESA, 2012; AC Transit, 2012; Wiltec (traffic counting firm), 2012; *23rd Street Road Diet Traffic Study,* Dowling Associates, Inc., May 2012.

**TABLE 3.13-2**
**TRANSIT BUS ROUTE SERVICE IN THE PROJECT AREA**

| Line | Route Description | Frequency |
|---|---|---|
| 1 | BART Berkeley to BART Bay Fair Station | Weekdays (5:12 a.m. to 12:33 a.m.): every 5 min to 20 min; Weekends (5:02 a.m. to 1:07 a.m.): every 10 min to 20 min |
| 7 | El Cerrito del Norte BART to Berkeley BART via Arlington Ave. and Shattuck Ave. | Weekdays (6:01 a.m. to 8:03 p.m.): every 30 min to 50 min; Weekends (8:10 a.m. to 6:41 a.m.): every 45 min |
| 25 | Two-way loop: El Cerrito Plaza BART, Central Ave, Pierce St., University Village, Gilman St., Hopkins St., Martin Luther King Jr. Way, Berkeley BART, Martin Luther King Jr. Way, Solano Ave., Colusa Ave., Fairmount Ave. | Weekdays (7:00 a.m. to 7:40 p.m.): every 40 min; Weekends (8:01 a.m. to 6:01 a.m.): every 60 min |
| 49 | *Loop A*: Rockridge BART, College Avenue, Ashby Avenue, 7th Street, Dwight Way, Shattuck Avenue, Berkeley BART, Bancroft Way / Durant Avenue, Piedmont Avenue, Warring Street, Derby Street, Claremont Blvd., Claremont Avenue and College Avenue<br>*Loop B*: reverse order of above | Weekdays (6:00 a.m. to 7:00 p.m.): every 30 min; Weekends (6:00 a.m. to 7:00 p.m.): every 40 min; |
| 51B | Rockridge BART to Berkeley Amtrak or Berkeley Marina via College Ave., Bancroft Way / Durant Ave., Shattuck Ave., Berkeley BART, and University Ave. | Weekdays (5:30 a.m. to 12:03 a.m.): every 9 min to 20 min; Weekends (5:33 a.m. to 11:55 p.m.): every 20 min |
| 70 | Richmond BART to Richmond Pkwy. Transit Center via 18th St., Rheem Ave., Doctor's Medical Center, San Pablo Dam Rd., Appian Way and Fitzgerald Dr. | Weekdays (6:00 a.m. to 8:47 p.m.): every 30 min; Weekends (6:38 a.m. to 9:07 p.m.): every 60 min |
| 72/72M | Oakland Amtrak, BART El Cerrito, Contra Costa College, BART Richmond, | Weekdays (4:46 a.m. to 1:21 a.m.): every 20 min to 30 min; Weekends (5:10 a.m. to 1:33 a.m.): every 20 min to 30 min |
| 72R | Jack London Square to Contra Costa College | Weekdays (7:02 a.m. to 8:15 p.m.): every 12 min; No weekend service provided |
| 74 | BART Richmond to Hilltop Shopping Mall | Weekdays (5:28 a.m. to 10:15 p.m.): every 30 min to 40 min; Weekends (7:00 a.m. to 8:23 p.m.): every 28 min to 33 min |
| 76 | El Cerrito del Norte BART to Hilltop Mall via Cutting Blvd., Richmond BART, North Richmond, Church Lane, Market St., Contra Costa College, Birmingham Dr. and Shane Rd. | Weekdays (5:37 a.m. to 7:42 p.m.): every 20 min to 30 min; Weekends (6:30 a.m. to 8:20 p.m.): every 30 min |
| 376 | El Cerrito Del Norte BART to Pinole Vista via Cutting Blvd., Richmond BART, North Richmond, Contra Costa College, Parchester Village, and Richmond Pkwy. Return via Richmond Parkway Transit Center and Hilltop Mall. | Daily (8:11 p.m. to 3:42 a.m.): every 20 min to 30 min |
| 684 | BART Richmond to El Cerrito High School | One scheduled weekday eastbound route: 7:00 a.m. to 7:37 a.m., and two scheduled weekday westbound routes: 2:07 p.m. to 2:34 p.m., and 3:52 p.m. to 4:19 p.m.; No weekend service provided |
| 800 | Market St./Van Ness Ave. (San Francisco) to BART Richmond | Weekdays (1:02 a.m. to 5:02 a.m.): limited night time service every 60 min; Weekends (12:32 a.m. to 6:02 a.m.); limited night time service every 30 min |

**TABLE 3.13-2 (Continued)**
**TRANSIT BUS ROUTE SERVICE IN THE PROJECT AREA**

| Line | Route Description | Frequency |
|---|---|---|
| 851 | All Nighter. Downtown Berkeley to Fruitvale BART via UC Campus South, College Ave., Broadway, downtown Oakland, Webster St., Santa Clara Ave., Broadway, and Fruitvale Ave. | Daily (12:11 a.m. to 4:11 a.m.): every 60 min. |
| E | Caldecott Lane and Tunnel Road to Transbay Temporary Terminal, San Francisco via Claremont Avenue | Scheduled weekday Eastbound service (at 6:59 a.m., and five afternoon services from 4:45 p.m. to 7:09 p.m.); Scheduled weekday Westbound service (at 6:19 a.m., 7:19 a.m., 7:46 a.m., 8:13 a.m., and 5:26 p.m.); No weekend service provided |
| G | San Francisco Transbay Terminal to Potrero Ave./Richmond St. (El Cerrito) | Weekday Eastbound service (4:40 p.m. to 7:52 p.m.): every 30 min; Weekday Westbound service (5:33 a.m. to 8:45 a.m.): every 60 min; No weekend service provided |
| L/LC | San Francisco Transbay Terminal to Hilltop Park-and-Ride (Richmond) | Weekday Eastbound service (3:10 p.m. to 10:19 p.m.): every 15 to 40 min; Weekday Westbound service (5:30 a.m. to 9:40 a.m.): every 25 to 30 min; No weekend service provided |

SOURCE: Alameda-Contra Costa Transit District (AC Transit), April 2012.

pedestrian signals at major street intersection locations, signage, and planters and additional streetscape attributes to safely delineate and separate pedestrian facilities from other modes within the established circulation network. It should be noted that sidewalks exist on both sides of all streets included in Table 3.13-1, except on The Uplands and Parkside Drive in Berkeley, which have a sidewalk on only one side.

### Bicycle Facilities

The *Highway Design Manual*, California Department of Transportation (Caltrans, 2012a), classifies bikeways into three categories:

- ***Class I Multi-Use Path*****:** a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.
- ***Class II Bike Lane*****:** a striped and signed lane for one-way bike travel on a street or highway.
- ***Class III Bike Route*****:** signing only for shared use with motor vehicles within the same travel lane on a street or highway.

As indicated in Table 3.13-1, of those roadways that include bicycle facilities the majority are Class III shared-use bicycle routes along both travel lanes. Some of the major arterials, including Telegraph Avenue and the northerly portion of 23rd Street, include Class II striped bicycle lanes on both sides of the roadways.

To supplement existing bicycle facilities, additional bicycle facilities are planned within the project area. According to the City of Berkeley *Bicycle Master Plan* (City of Berkeley, 2005), there are several planned bicycle facilities within the project area. Notably, recommendations outlined in the City of Berkeley *Bicycle Master Plan* include upgrading the condition of bicycle facilities along Telegraph Avenue and providing a Class III facility along the entire roadway within the city; installing Class II bicycle lanes along Woolsey Street; and extending Class II lanes eastward along The Uplands to Tunnel Road. As stated in the City of Richmond *Bicycle Master Plan* (City of Richmond, 2011b), streetscape improvements along 23rd Street and Nevin Avenue are currently in the design and/or construction phases, and these projects include enhancements to lighting and landscaping, installation of sidewalks, lane reductions, intersection improvements, and specific to Nevin Avenue, the installation of a Class III bike route along the roadway. The City of San Pablo's *San Pablo Avenue Specific Plan* (City of San Pablo, 2011a) includes bicycle enhancements along the San Pablo Avenue corridor and planned Class II facilities along the roadway from Road 20 to the south and extending north beyond the city limits, as well as a planned Class III bicycle facility along Brookside Drive. There is an existing Class II bicycle facility on 23rd Street in the city of San Pablo, extending between Brookside Avenue and Maricopa Avenue/Costa Avenue.

The City of El Cerrito's *Circulation Plan for Bicyclists and Pedestrians (Adopted by City Council June 18, 2007)* states that the City is currently pursuing streetscape improvements for the bicycling, walking and transit environment along San Pablo Avenue. Future long-term development of a Class II on-street striped bike lane will only be considered in coordination with neighboring jurisdictions and transit agencies as supportive land uses, transportation access, and streetscape improvements are developed.

# 3.13.2 Regulatory Setting

## Federal Regulations

### *Code of Federal Regulations*

The Code of Federal Regulations (CFR) includes the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government. The rules under Title 49 address safety considerations for the transport of goods, materials, and substances and govern the transportation of hazardous materials, including types of materials and marking of the transportation vehicles (United States Federal Government, 2012).

## State Regulations

### *Department of Transportation (Caltrans)*

Caltrans manages interregional transportation, including management and construction of the California highway system. In addition, Caltrans is responsible for permitting and regulation of the use of state roadways. State roadways that are likely to be used as access routes by construction workers and construction vehicles to the various project sites include: I-80, I-580, SR 13 (Ashby Avenue), SR 24, and SR 123 (San Pablo Avenue).

Caltrans' construction management practices require temporary traffic control planning "during time periods when the normal function of a roadway is suspended" (Caltrans, 2010). Furthermore, Caltrans requires that permits be obtained for transportation of oversized loads and transportation of certain materials, and for construction-related traffic disturbance.

### Local Policies

The planned pipeline segments would span four municipal jurisdictions that have established general plan goals and policies pertaining to the operation and maintenance of the transportation network within their respective jurisdictions (City of Berkeley, 2003; City of El Cerrito, 1999; City of Richmond, 2011a; and City of San Pablo, 2011b). Relevant City of Berkeley objectives and policies include the continued support to facilitate the movement of goods and materials through designated truck routes and to minimize the impacts of trucks in residential areas, and to require, as part of the city review process, approval of a construction truck route plan for all contractors in the city (Policy T-23). Similarly, both the City of Richmond (Action CR4.B) and the City of San Pablo (Policy C-I-31) have policies to establish the appropriate routing of trucks away from neighborhoods streets and sensitive uses (e.g., homes, schools, parks and playgrounds). The City of El Cerrito has policies to maintain truck mobility (Policy T1.6) and transportation facilities for emergency vehicle access (Policy T1.7).

The pipeline construction contractors will be required to obtain encroachment permits from the respective jurisdictions for work within the public rights-of-way and to comply with all permit conditions, including those established to minimize disruption of traffic and inconvenience to the public.

## 3.13.3 Impacts and Mitigation Measures

### Significance Criteria

This section addresses the following standards of significance based on the CEQA Guidelines. An impact would be considered significant if the project would:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulations system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.
- Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate emergency access.

- Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

It should be noted that because the Project results in changes to transportation along corridors far from any major airport, and the work does not require any activity that would affect air transportation, there is no impact relative to air traffic patterns, so this criterion is not applicable to this Project.

### *Thresholds of Significance*

While congestion management program level of service (LOS) standards apply to permanent traffic-generating projects and not to temporary traffic-generating activities like this Project, in order to fully inform the reader and decision-makers about potential impacts during construction, LOS analysis is presented below.

#### City of Berkeley

The City of Berkeley's level of service standard is LOS D for signalized and unsignalized intersections. Intersections that exceed this service level threshold are considered impacted and should be considered for mitigation. For unsignalized intersections, additional considerations are involved, including the number of vehicles on the critical approach, vehicles contributed by the proposed Project, and potential need for a traffic signal. Exceptions to the LOS D standard arise when the project is not expected to add more than three seconds of delay at an intersection that is operating at LOS E, or increase the Volume to Capacity (V/C) ratio by more than 0.01 at an intersection that is operating at LOS F without the proposed Project.

#### City of El Cerrito

An impact to a study intersection would be significant if the intersection is operating at an acceptable level of service and would deteriorate to an unacceptable level with the addition of project or cumulative traffic. The City's policy for traffic operation standards calls for achievement of LOS D or better conditions at intersections within the city.

#### City of Richmond General Plan

Vehicular LOS standards shall be maintained for signalized intersections consistent with the Contra Costa Transportation Authority's (CCTA) *West County Action Plan* for Routes of Regional Significance, summarized below.

#### City of San Pablo General Plan 2030

Traffic LOS standards shall be applied to signalized intersections on Routes of Regional Significance to be consistent with the CCTA *West County Action Plan*, summarized below.

#### Contra Costa Transportation Authority West County Action Plan (CCTAWCAP)

As stated above, LOS standards for signalized intersections in the cities of San Pablo and Richmond shall be consistent with the CCTAWC Action Plan. The West County Routes of Regional Significance include San Pablo Avenue from I-80/Pomona Street in Crockett to

Alameda County, and 23rd Street from San Pablo Avenue/Road 20 to I-580. The minimum acceptable operations for intersections under the CCTAWCAP are as follows:

- For San Pablo Avenue, maintain LOS E or better at all signalized intersections along San Pablo Avenue (measured using the CCTA LOS software[1] to analyze peak hour vehicular turning movement counts).
- For 23rd Street, maintain LOS D or better at all signalized intersections along 23rd Street (measured using the CCTA LOS software to analyze peak hour vehicular turning movement counts).

## Approach to Analysis

Potential traffic and circulation impacts were evaluated on the basis of field reconnaissance; traffic volume data collected for key roadways and intersections, and estimated vehicle trips for the horizon year of the Project's construction. While trips that Project-related activities would generate during each construction phase, on both a daily and peak hourly basis, were estimated, this information was developed for reference only as there would be a limited number of Project-related trips and there would not be a consistent pattern that would add trips at any single location. These Project-generated trips (workers deliveries, etc.) were therefore considered to be part of the background growth projected for each horizon year.

In addition to potential impacts to traffic flow and circulation in the affected areas, impacts to alternative transportation (transit, bicycle or pedestrian facilities), access for emergency vehicles, and traffic safety were also evaluated.

### *Baseline Conditions*

Because construction of the proposed pipelines would not occur until 2015-2017 for Wildcat Pipelines in Berkeley and El Cerrito, and 2021-2022 for the Central Pressure Zone pipelines in El Cerrito, Richmond and San Pablo, traffic volumes for the horizon years (i.e. last planned year for construction) were projected by applying growth rate factors (obtained from sources described below) to the traffic counts obtained for the study intersections along both the construction routes and the detour routes. Accounting for the impact of the projected increased traffic volumes provides a reasonable baseline for the evaluation of potential traffic impacts as it assesses the Project in the context of the existing roadway network with the additional traffic volumes that are expected to exist when construction occurs.

For the study intersections located in the city of Berkeley, where the Wildcat Pipeline (Berkeley) would be constructed in 2015-2017, a one percent annual growth rate was applied to the existing traffic counts to project future 2016 traffic volumes. This growth rate was determined in consultation with City of Berkeley staff. The one-percent growth rate assumption is reasonable because Berkeley is relatively built out, and the City of Berkeley proactively encourages the use of alternative transportation modes by enhancing pedestrian and bicycle facilities. Additionally,

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1 CCTA LOS software is a software program developed by CCTA for LOS calculations.

Berkeley is well-served by transit including BART, AC Transit and University of California Campus Shuttles.

For the study intersections located in the cities of El Cerrito, Richmond and San Pablo for both the Wildcat Pipeline (El Cerrito) to be constructed in 2015-2017 and the Central Pressure Zone Pipelines (El Cerrito, Richmond and San Pablo), to be constructed in 2021-2022, an annual growth rate was determined based on regional growth estimates presented in the West County Action Plan for Routes of Regional Significance – 2009 Update, developed by the Contra Costa Transportation Authority and the West Contra Costa Transportation Advisory Committee (CCTA, 2009). The West County Action Plan used a Countywide Travel Demand Forecasting Model to geographically analyze the projected growth of dwelling units and jobs and estimate the impacts of this growth on the roadway system. The growth forecasts used in the West County Action Plan were based on the demographic forecasts from the Association of Bay Area Governments “Projections 2005” and incorporate local jurisdiction input. The West County Action Plan projected that between 2008 and the 2030 traffic on roadways in West Contra Costa County would increase by an average of 33 percent over the 22-year period, which equates to an annual growth rate of 1.3 percent. The annual growth rate of 1.3 percent was applied to the existing traffic volumes to project the future 2016 and 2022 traffic volumes for the study intersections located in the cities of El Cerrito, Richmond and San Pablo[2]. The factored traffic volumes represent baseline (”without project”) conditions at the time of the construction of the projects.

The derived traffic volumes, traffic signal parameters, and lane characteristics were entered into the Synchro 7 traffic analysis program for the LOS analysis based on the *Highway Capacity Manual* (HCM) analysis procedures. It should be noted that the CCTA LOS methodology recommended in the West County Action Plan was not applied to this analysis; rather, operation was evaluated using the Synchro software package. While the CCTA LOS procedure provides results that are appropriate for planning purposes, it is less sophisticated than the Synchro software (e.g., does not account for changes to phasing and coordinated timing), and because these types of operational changes were anticipated to be part of the potential mitigation measures for the proposed Project, it was determined that the Synchro software would provide a better indication of the success of such measures. Further, it is understood that the CCTA has recently adopted the HCM methodologies and will no longer be requiring use of the CCTA LOS methodology.

### *Intersection Level of Service*

#### Methodologies

LOS is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, LOS A represents free flow conditions and LOS F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay (second per vehicle) accompanies the LOS designation.

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2 The following formula was used to estimate the projected future traffic volumes: F = P (1+Gf)^N, where F = future (or horizon) year traffic volume; P = present (or existing) traffic volume; Gf = growth factor; and N = number of years between the existing and future years.

The LOS for the intersections with side street stop controls (unsignalized with one or two approaches stop controlled) were analyzed using the "Two-Way Stop-Controlled" intersection capacity method from the HCM. This methodology determines a level of service for each minor turning movement by estimating the level of average delay in seconds per vehicle. Results are presented for individual movements together with the weighted overall average delay for the intersection.

The study intersections with stop signs on all approaches were analyzed using the "All-Way Stop-Controlled" intersection methodology from the HCM. This methodology evaluates delay for each approach based on turning movements, opposing and conflicting traffic volumes, and the number of lanes. Average vehicle delay is computed for the intersection as a whole, and is then related to a LOS.

The study intersections that are currently controlled by a traffic signal were evaluated using the signalized methodology from the HCM. This methodology is based on factors including traffic volumes, green time for each movement, signal phasing, whether or not the signals are coordinated, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. For purposes of this study, delays were calculated using optimized signal timing.

The ranges of delay associated with the various levels of service are indicated in **Table 3.13-3**.

Under Baseline Conditions and Baseline plus Project Conditions, all of the study intersections are analyzed, including intersections that would be affected by any proposed detour routes.

### *Study Periods*

Typical construction hours would generally be between 8:00 a.m. and 7:00 p.m. Monday through Friday, and as such, traffic operating conditions were evaluated for the a.m. and p.m. peak periods to capture the highest potential impacts for the proposed Project when volumes are typically highest on the local transportation network. The morning peak hour occurs between 7:00 a.m. and 9:00 a.m. and reflects conditions during the home to work or school commute, while the p.m. peak hour occurs between 4:00 p.m. and 6:00 p.m. and typically reflects the highest level of congestion during the homeward bound commute.

## Impacts and Mitigation Measures

**Impact 3.13-1: Closure of travel lanes during project construction would temporarily reduce roadway capacity and increase traffic delays on area roadways, causing temporary and intermittent conflicts with all modes of travel, but the effects would be of short duration and limited in magnitude (applies to all pipelines).**

An assessment was made to determine the likely change in traffic operation (including intersection LOS) along the pipeline routes as well as along the detour routes during a.m. and p.m. peak-hour construction periods. Because the proposed Project would require temporary closures of either lanes or entire street segments, some traffic would be diverted to alternative

**TABLE 3.13-3**
**INTERSECTION LEVEL OF SERVICE CRITERIA**

| LOS | Two-Way Stop-Controlled | All-Way Stop-Controlled | Signalized |
|---|---|---|---|
| A | Delay of 0.0 to 10.0 seconds. Gaps in traffic are readily available for drivers exiting the minor street. | Delay of 0.0 to 10.0 seconds. Upon stopping, drivers are immediately able to proceed. | Delay of 0.0 to 10.0 seconds. Most vehicles arrive during the green phase, so do not stop at all. |
| B | Delay of 10.1 to 15.0 seconds. Gaps in traffic are somewhat less readily available than with LOS A, but no queuing occurs on the minor street. | Delay of 10.1 to 15.0 seconds. Drivers may wait for one or two vehicles to clear the intersection before proceeding from a stop. | Delay of 10.1 to 20.0 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop. |
| C | Delay of 15.1 to 25.0 seconds. Acceptable gaps in traffic are less frequent, and drivers may approach while another vehicle is already waiting to exit the side street. | Delay of 15.1 to 25.0 seconds. Drivers will enter a queue of one or two vehicles on the same approach, and wait for vehicle to clear from one or more approaches prior to entering the intersection. | Delay of 20.1 to 35.0 seconds. The number of vehicles stopping is significant, although many still pass through without stopping. |
| D | Delay of 25.1 to 35.0 seconds. There are fewer acceptable gaps in traffic, and drivers may enter a queue of one or two vehicles on the side street. | Delay of 25.1 to 35.0 seconds. Queues of more than two vehicles are encountered on one or more approaches. | Delay of 35.1 to 55.0 seconds. The influence of congestion is noticeable, and most vehicles have to stop. |
| E | Delay of 35.1 to 50.0 seconds. Few acceptable gaps in traffic are available, and longer queues may form on the side street. | Delay of 35.1 to 50.0 seconds. Longer queues are encountered on more than one approach to the intersection. | Delay of 55.1 to 80.0 seconds. Most, if not all, vehicles must stop and drivers consider the delay excessive. |
| F | Delay of more than 50.0 seconds. Drivers may wait for long periods before there is an acceptable gap in traffic for exiting the side streets, creating long queues. | Delay of more than 50.0 seconds. Drivers enter long queues on all approaches. | Delay of more than 80.0 seconds. Vehicles may wait through more than one cycle to clear the intersection. |

SOURCE: Transportation Research Board, *Highway Capacity Manual,* 2000

routes, resulting in increased volumes along those diverted routes. The change in daily traffic for each construction segment is shown in **Table 3.13-4**, along with the detour routes that are expected to handle the detoured traffic volumes. It is assumed that segments closed for construction would only stay closed from 8:00 a.m. to 7:00 p.m., and would affect about 75 to 85 percent of average daily traffic[3].

### Wildcat Pipeline (Berkeley)

Most of the Wildcat Pipeline (Berkeley) is located along residential streets in the city of Berkeley. Because the residential streets are narrow (i.e. from 28 to 36 feet wide) and the pipeline construction requires approximately 25 to 30 feet of the street width, these streets would be closed during construction hours on a block-by-block basis because there will not be adequate room to safely progress traffic through the work zone. As a result, through traffic would be

3 Based on traffic counts, 75 to 85 percent of average daily traffic occurs between the hours of 8:00 a.m. and 7:00 p.m.

**TABLE 3.13-4**
**SUMMARY OF DETOURED VOLUMES AND ROUTES**

| Roadway / Segment | Traffic Volumes[b] | Detoured Volumes | Detour Routes |
|---|---|---|---|
| **Wildcat Pipeline (Berkeley)** | | | |
| Dana St.:<br>▪ Parker St. to Ward St. | 770 vpd | 609 vpd | Parker St.; Telegraph Ave.; Ward St. |
| Ward St.<br>▪ Dana St. to Telegraph Ave. | 1,088 vpd | 839 vpd | Dana St.; Derby St.; Telegraph Ave. |
| Telegraph Ave.<br>▪ Ward St. to Stuart St. | 18,026 vpd | 0 vpd | N/A |
| Stuart St.<br>▪ Telegraph Ave. to Hillegass Ave. | 1,955 vpd | 1,577 vpd | Telegraph Ave.; Derby St.; College Ave. |
| Hillegass Ave.<br>▪ Stuart St. to Woolsey St. | 1,539 vpd | 1,282 vpd | Stuart St.; College Ave.; Ashby Ave.; Woolsey St. |
| Woolsey St.<br>▪ Hillegass Ave. to Claremont Ave./Uplands | 764 vpd | 643 vpd | Hillegass Ave.; Ashby Ave.; College Ave.; Alcatraz Ave.; Claremont Ave. |
| Claremont Ave.<br>• Woolsey St. to The Uplands | 12,600 vpd | 0 vpd | N/A |
| The Uplands<br>▪ Claremont Ave. to Nogales St. | 1,848 vpd | 1,525 vpd | Claremont Ave.; Hillcrest Road |
| **Wildcat Pipeline (Berkeley) - *Benvenue Option*** | | | |
| Stuart St.<br>▪ Hillegass Ave. to Benvenue Ave. | 1,955 vpd | 1,577 vpd | Hillegass Ave.; Derby St.; College Ave. |
| Benvenue Ave.<br>▪ Stuart St. to Woolsey St. | 862 vpd | 668 vpd | Stuart St.; College Ave.; Woolsey St. |
| **Wildcat Pipeline (El Cerrito)** | | | |
| Hill St.:<br>▪ Liberty St. to Elm St. | Not available | N/A | Elm St.; Key Blvd; Cutting Blvd; Knott Ave.; San Pablo Ave. |
| Elm St.:<br>▪ Hill St. to Richmond St. | 6,747 vpd | 5,363 vpd | Key Blvd; Cutting Blvd; Knott Ave.; San Pablo Ave.; Potrero Ave. |
| Richmond St.:<br>▪ Elm St. to Lincoln Ave. | 6,254 vpd | 5,133 vpd | Potrero Ave.; San Pablo Ave.; Manila Ave.; Moeser Lane; Ashbury Ave.; Stockton Ave.; Lincoln Ave. |
| Lincoln Ave.:<br>▪ Richmond St. to Norvell St. | 1,000 vpd | 800 vpd | Richmond St.; Fairmount Ave.; Norvell St. |
| Norvell St.<br>▪ Lincoln Ave. to Fairmount Ave. | 1,000 vpd | 800 vpd | Richmond St.; Lincoln Ave.; Ashbury Ave.; Fairmount Ave. |
| Fairmount Ave.<br>▪ Norvell St. to Behrens St. | 8,720 vpd | 6,954 vpd | Norvell St.; Lincoln Ave.; Ashbury Ave. |
| Behrens St.<br>▪ Fairmount Ave. to C St. | 1,000 vpd | 800 vpd | Fairmount Ave.; Ashbury Ave.; C St. |
| C St.<br>▪ Behrens St. to Ashbury Ave. | 1,000 vpd | 800 vpd | Behrens St.; Fairmount Ave.; Ashbury Ave. |
| Ashbury Ave.:<br>▪ C St. to Lynn Ave. | 4,071 vpd | 3,160 vpd | Fairmount Ave.; Carmel Ave.; Lynn Ave. |
| Lynn Ave.:<br>▪ Ashbury Ave. to San Carlos Ave. | Not available | N/A | Ashbury Ave.; Fairmount Ave.; Carmel Ave. |
| **Central Pressure Zone Pipeline (El Cerrito/Richmond)** | | | |
| San Pablo Ave. (SR 123):<br>▪ Nevin Ave. to Central Ave. | 22,000 vpd | 0 vpd | N/A |

**TABLE 3.13-4 (Continued)**
**SUMMARY OF DETOURED VOLUMES AND ROUTES**

| Roadway / Segment | Traffic Volumes[b] | Detoured Volumes | Detour Routes |
|---|---|---|---|
| Central Pressure Zone Pipeline (Richmond/San Pablo) | | | |
| Brookside Drive:<br>▪ 21st St. to 23rd St. | 3,200 vpd | 0 vpd | N/A |
| 23rd St.<br>▪ Brookside Drive to Nevin Ave. | 23,400 vpd | 1,900 vpd | Rumrill Blvd; 13th St.; Pennsylvania Ave.; Harbour Way; Macdonald Ave. |
| Central Pressure Zone Pipeline (Richmond/San Pablo) – *San Pablo Ave. Option* | | | |
| 23rd St.:<br>▪ San Pablo Ave. to Brookside Dr. | 19,000 vpd | 1,900 vpd | Rumrill Blvd; 13th St.; Pennsylvania Ave.; Harbour Way; Macdonald Ave. |

detoured around closed segments. Two arterials would also be affected – Telegraph Avenue and Claremont Avenue. These two roadways would remain open during construction and through traffic would be accommodated around the work zone. The Wildcat Pipeline (Berkeley) includes the option of routing along Benvenue Avenue instead of Hillegass Avenue.

The following intersections were selected for analysis based on the expected impact due to the pipeline construction and associated traffic detour. Intersections located on detour routes are *italicized*. **Figure TC-1** (Traffic Control Scheme figures are located in Appendix D) shows the proposed detour routes for the Wildcat Pipeline (Berkeley).

1. *Telegraph Avenue/Derby Street*
2. Telegraph Avenue/Stuart Street
3. *College Avenue/Derby Street (south)*
4. *College Avenue/Derby Street (north)*
5. *College Avenue/Alcatraz Avenue*
6. Claremont Avenue/The Uplands
7. *Claremont Avenue/Hillcrest Road/Brookside Drive*

*Based on a review of pla*nned transportation improvements, no changes to the existing roadway network are assumed to occur in the study area. AC Transit had proposed to implement Bus Rapid Transit (BRT) along Telegraph Avenue in Berkeley and Oakland, but ultimately decided to build the Downtown Oakland – San Leandro BRT Alternative instead. For purposes of this analysis, it was assumed that the AC Transit BRT would not be in place at the time of construction. There is no planned roadway widening in the study area.

**Table 3.13-5** shows the peak-hour intersection level of service results under Baseline Conditions and Baseline plus Project Conditions, based on 2016 projected turning movement volumes (**Figure 3.13-1**) and existing lane configurations and traffic controls (**Figure 3.13-2**) for the Wildcat Pipeline (Berkeley) segment. The projected future volume projections were used along with the lane configuration through the construction zone to estimate the additional delay associated with the construction project.

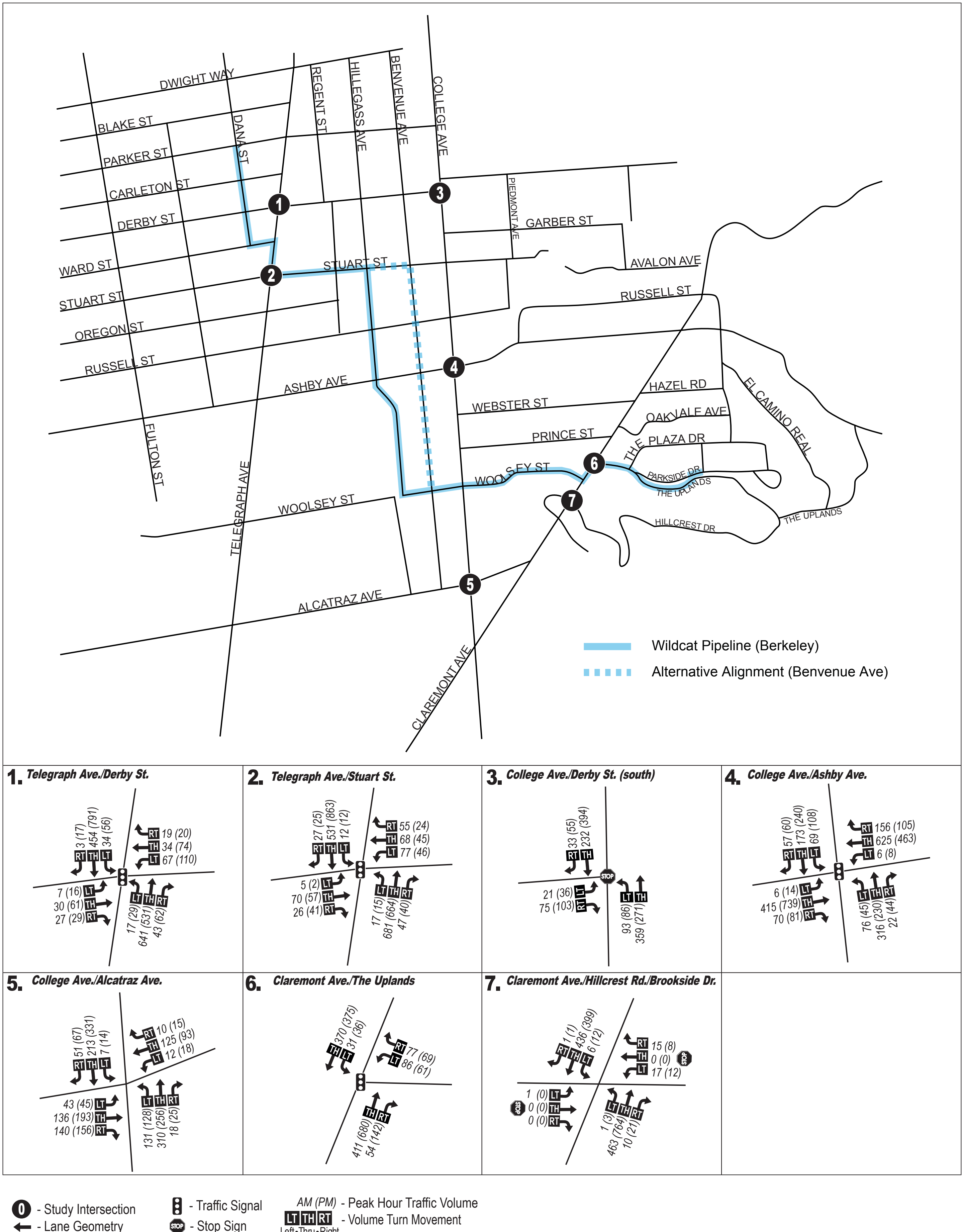
**TABLE 3.13-5**
**PEAK HOUR INTERSECTION LOS CALCULATIONS**
**WILDCAT PIPELINE (BERKELEY)**

| **Study Intersection** ***Approach*** | **Traffic Controls** | **Baseline Conditions** | | | | **Baseline plus Project Conditions** | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | **AM Peak** | | **PM Peak** | | **AM Peak** | | **PM Peak** | |
| | | **Delay** | **LOS** | **Delay** | **LOS** | **Delay** | **LOS** | **Delay** | **LOS** |
| *1. Telegraph Ave/Derby St* | Signalized | 5 | A | 7 | A | 8 | A | 10 | A |
| 2. Telegraph Ave/Stuart St | Signalized | 6 | A | 5 | A | 11 | B | 12 | B |
| *3. College Ave/Derby St (S)* | AWSC | 13 | B | 15 | B | 29 | D | 22 | C |
| *4. College Ave/Ashby Ave* | Signalized | 11 | B | 24 | C | 14 | B | 53 | D |
| *5. College Ave/Alcatraz Ave* | Signalized | 10 | A | 11 | B | 10 | A | 16 | B |
| 6. Claremont Ave/The Uplands | Signalized | 5 | A | 4 | A | 5 | A | 9 | A |
| *7. Claremont Ave/Hillcrest Blvd/ Brookside Dr* | TWSC | 1 | A | 1 | A | 2 | A | 13 | B |
| Westbound Approach | | 15 | B | 24 | C | 23 | C | 114 | **F** |
| With a flagger (WB Approach) | | | | | | 15 | B | 13 | B |

NOTES:
Delay is measured in average seconds per vehicle; LOS = Level of Service AWSC = All-Way Stop Controlled; TWSC = Two-Way Stop-Controlled
Intersections located on detour route are *italicized*
Significant Impacts are shown in **bold** text.
LOS Calculations for the Wildcat Pipeline (Berkeley) Project are provided in **Appendix J**

The LOS results in Table 3.13-5 indicate that under Baseline plus Project Conditions, all of the study intersections along the proposed detour routes would operate at LOS D or better, except the westbound approach at the Claremont Avenue/Hillcrest Boulevard/Brookside Drive intersection, which would operate at LOS F during the p.m. peak period between the hours of 4:00 p.m. and 6:00 p.m. (i.e., westbound left-turn motorists are expected to experience an average delay of approximately 114 seconds). This impact would be *significant*. Deploying a flagger during the p.m. peak period is expected to improve the level of service for the westbound approach from LOS F to LOS B (i.e., the delay will be reduced from 114 seconds to approximately 13 seconds). Also, overall (analyzing all four approaches), the intersection is expected to operate at LOS A during the p.m. peak period with control by a flagger.

With regard to the duration of impacts, construction of the segment of the Wildcat Pipeline (Berkeley) along Claremont Avenue (between Woolsey Street and The Uplands) is expected last for approximately two to five weeks as indicated in Table 2-2 in Chapter 2. The construction for the tie-ins is expected to last for two and half weeks at each end. Additionally, it is expected to take four weeks to repave all affected streets. The impact at the Claremont Avenue/Hillcrest Road due to traffic detour will only occur during the p.m. peak period on weekdays when the pipeline is under construction.




SOURCE: DKS

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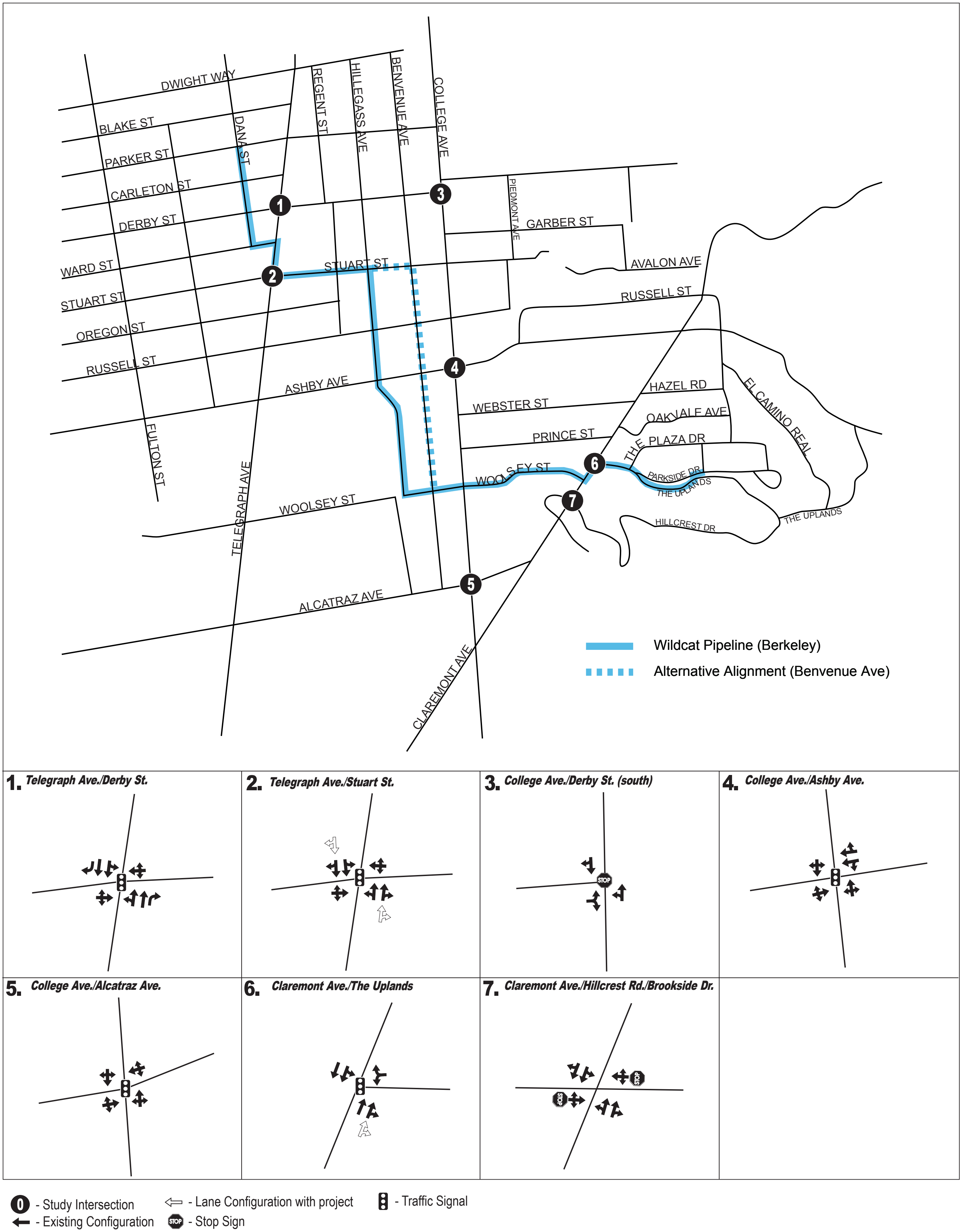
**Figure 3.13-1**
2016 Conditions Turning Movement Volumes
Wildcat Pipeline (Berkeley)




SOURCE: DKS



**Figure 3.13-2**
Lane Configurations and Traffic Controls
Wildcat Pipeline (Berkeley)

**Mitigation Measure TRA-1a: Intersection Traffic Control.**

A flagger will be deployed at the Claremont Avenue/ Hillcrest Boulevard/Brookside Drive intersection to control westbound traffic during the p.m. peak period. This would minimize the impact of the pipeline installation project.

With implementation of Mitigation Measure TRA-1a, the impact at the Claremont Avenue/ Hillcrest Boulevard/Brookside Drive intersection would be reduced to a *less-than-significant* level.

### Wildcat Pipeline (El Cerrito)

The Wildcat Pipeline (El Cerrito) is located on residential streets in the city of El Cerrito. Because most of the residential streets are narrow (i.e. between 26 feet and 36 feet wide) and the pipeline construction requires approximately 25 to 30 feet of the width of the street, most would be closed during construction hours on a block-by-block basis as the width is insufficient to allow traffic to proceed safely through the work zone. As a result, through traffic would be detoured around closed segments. One larger residential arterial, Ashbury Avenue, would also be affected. This road would remain open to southbound traffic during construction, and northbound traffic would be detoured around closed segments.

The following intersections were selected for analysis based on the expected impact due to the pipeline construction and associated traffic detour. Intersections located on detour routes are *italicized*. **Figure TC-5** shows the proposed detour routes for the Wildcat Pipeline (El Cerrito).

1. San Pablo Avenue/MacDonald Boulevard (not affected by the Wildcat Pipeline (El Cerrito))
2. *San Pablo Avenue/Cutting Boulevard*
3. *San Pablo Avenue/Eastshore Boulevard/Hill Street*
4. *San Pablo Avenue/Potrero Avenue*
5. *San Pablo Avenue/Moeser Lane*
6. *San Pablo Avenue/Central Aven*ue (not affected by the Wildcat Pipeline (El Cerrito))
7. San Pablo Avenue/Fairmount Avenue (not affected by the Wildcat Pipeline (El Cerrito))
8. Elm Street/Key Boulevard/Hill Street
9. Richmond Street/Potrero Avenue
10. Richmond Street/Moeser Lane
11. *Richmond Street/Central Avenue*
12. *Richmond Street/Fairmount Avenue*
13. *Fairmount Avenue/Colusa Avenue*

The underlined intersections above are included for clarity as they are shown in the traffic volume and lane configuration figures for the Wildcat Pipeline (El Cerrito) and Central Pressure Zone Pipeline (El Cerrito/Richmond). These intersections are not included in the LOS table because they would not be adversely affected by the Wildcat Pipeline (El Cerrito) project.

Based on a review of planned transportation improvements, no changes to the existing roadway network are assumed to occur in the study area. The West Contra Costa Transportation Advisory Committee (WCCTAC) is exploring the possibility of implementing a BRT project along San Pablo Avenue. This potential BRT project could increase traffic congestion along San Pablo Avenue during peak periods as it requires dedicated travel lanes, which would result in only one lane for non-transit vehicles in both the northbound and southbound directions. However, because the proposed BRT has not been adopted, the analysis assumes no change in the configuration of San Pablo Avenue. Consistent with the proposed traffic handling approach, the LOS analysis for the study intersections along San Pablo Avenue assumed the closure of the southbound approach and converting one of the two northbound lanes to a southbound lane within the construction zone. There are no plans to widen roadways in the study area.

The Wildcat Pipeline (El Cerrito) alignment requires 25-30 feet for the pipeline work zone along Hill Street, Elm Street, and Richmond Street. Affected segments of Elm Street and Richmond Street would need to be closed for construction because they have widths less than 40 feet, which will provide inadequate room to allow traffic to proceed safely through the work zone. The affected segment of Hill Street has a width of approximately 40 feet. Because Hill Street is a one-way eastbound roadway and carries relatively low traffic during the peak periods (i.e., less than 181 vehicles per hour), it is proposed to keep one lane open during construction.

**Table 3.13-6** shows the peak-hour intersection LOS results under Baseline Conditions and Baseline plus Project Conditions, based on 2016 projected turning movement volumes (**Figure 3.13-3**) and lane configurations and traffic controls (**Figure 3.13-4**) for the Wildcat Pipeline (El Cerrito). The projected future volume projections were used along with the lane configuration through the construction zone to estimate the additional delay associated with the construction project. The existing intersection lane configurations and traffic controls were used because the potential San Pablo Avenue BRT project has not been adopted.

With regard to the duration of impacts, the construction of the Wildcat Pipeline (El Cerrito) along all roadway segments in El Cerrito is expected to take approximately four to 12 weeks depending on the length of the pipeline segment, as indicated in Table 2-3 in Chapter 2. The construction of the tie-ins is expected to last up to two and half weeks at each location. Additionally, it is expected to take approximately four weeks to repave all affected streets. The impacts identified in Table 3.13-6 are expected to occur during the a.m. and p.m. peak periods only for the duration of the construction periods.

The road closures for the pipeline installation project would require detouring traffic, which may have impacts on other intersections that are not located along either the pipeline alignment or the specified detour route. The LOS results in Table 3.13-6 indicate that the added traffic associated with detours along Hill Street, Elm Street, and Richmond Street traffic under Baseline plus Project conditions would exacerbate unacceptable operating conditions at the study intersections that are already operating at LOS E or F during the a.m. peak hour and p.m. peak hour, and would result in deterioration to unacceptable operation at the following intersections:

- San Pablo Avenue/Cutting Boulevard (LOS D to LOS E)
- San Pablo Avenue/Eastshore Boulevard/Hill Street (LOS D to LOS E)
- San Pablo Avenue/Moeser Lane (LOS B to LOS E)
- San Pablo Avenue/Potrero Avenue (LOS B to LOS E)
- Richmond Street/Central Avenue (LOS C to LOS F)
- Richmond Street/Fairmount Avenue (LOS C to LOS F)

**TABLE 3.13-6**
**PEAK HOUR INTERSECTION LOS CALCULATIONS**
**WILDCAT PIPELINE (EL CERRITO)**

| Study Intersection | Traffic Controls | Baseline Conditions | | | | Baseline plus Project Conditions | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM Peak | | PM Peak | | AM Peak | | PM Peak | |
| | | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS |
| 2. *San Pablo Ave/Cutting Blvd* | Signalized | 41 | D | 116 | F | 58 | **E** | 116 | **F** |
| 3. *San Pablo Ave/Eastshore Blvd/Hill St* | Signalized | 36 | D | 80 | E | 78 | **E** | 120+ | **F** |
| 4. *San Pablo Ave/Potrero Ave* | Signalized | 12 | B | 11 | B | 35 | C | 57 | **E** |
| 5. *San Pablo Ave/Moeser Ln* | Signalized | 11 | B | 57 | E | 69 | **E** | 120+ | **F** |
| 8. Elm St/Key Blvd/Hill St | Signalized | 39 | D | 77 | E | n/a | n/a | n/a | n/a |
| 9. Richmond St/Potrero Ave | Signalized | 7 | A | 13 | B | 10 | B | 18 | B |
| 10. Richmond St/Moeser Ln | Signalized | 12 | B | 11 | B | 10 | A | 17 | B |
| 11. *Richmond St/Central Ave* | AWSC | 19 | C | 15 | C | 120+ | **F** | 120+ | **F** |
| *With temp. traffic flaggers* | | | | | | *18* | *B* | *17* | *B* |
| 12. *Richmond St/Fairmount Ave* | AWSC | 13 | B | 17 | C | 120+ | **F** | 120+ | **F** |
| *With temp. traffic flaggers* | | | | | | *39* | *D* | *86* | ***F*** |
| 13. *Fairmount Ave/Colusa Ave* | Signalized | 17 | B | 14 | B | 20 | B | 20 | C |

NOTES:
Delay is measured in average seconds per vehicle; LOS = Level of Service; AWSC = All-way stop-controlled
Intersections located on detour routes are *italicized*
Significant Impacts are shown in **bold** text
n/a – LOS analysis is not applicable to intersections along the alignment that will be closed for construction
LOS Calculations for the Wildcat Pipeline (El Cerrito) are provided in **Appendix K**

These impacts would be *significant*.

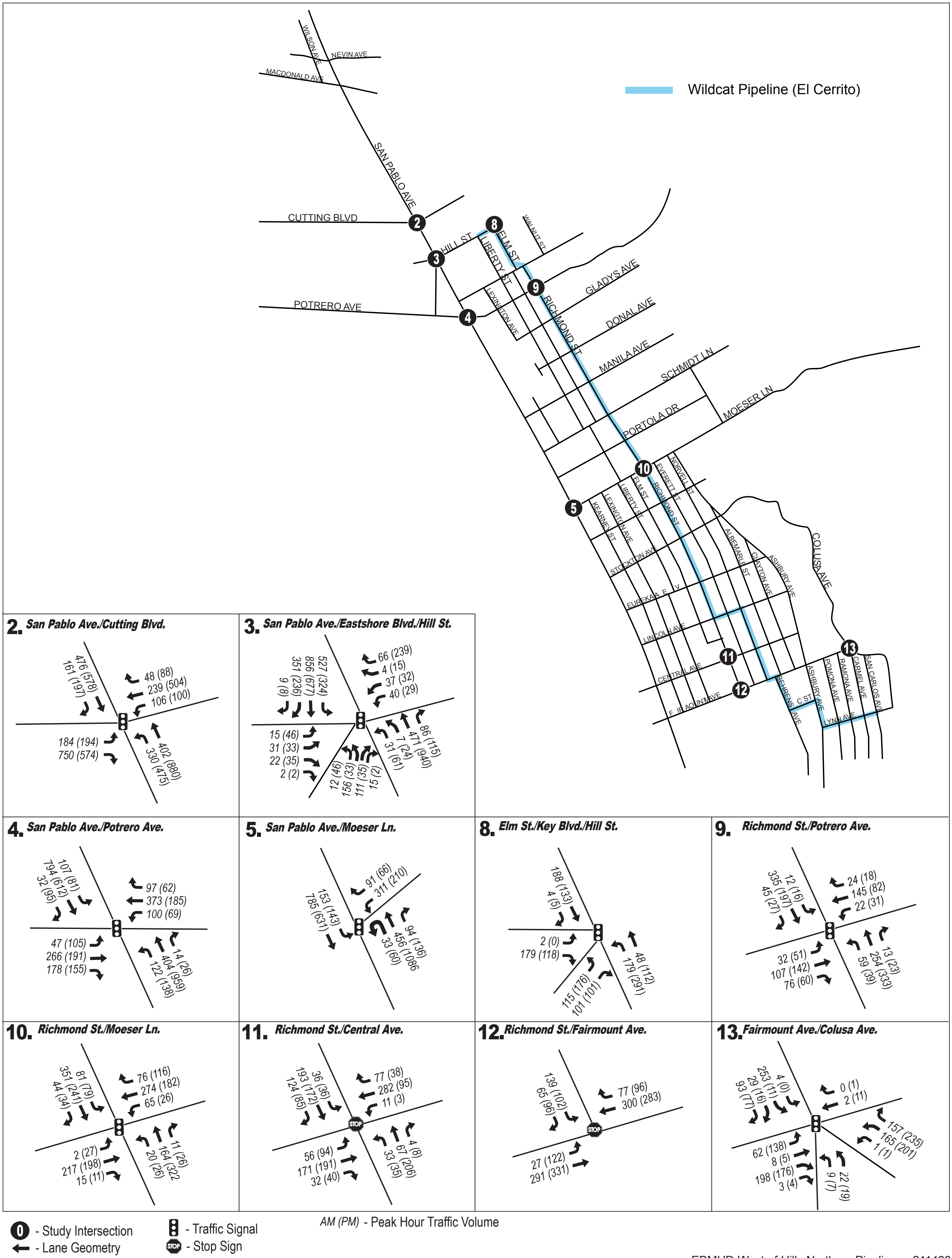
**Mitigation Measure TRA-1b: Intersection Traffic Control.**

Flaggers will be deployed at the Richmond Street/Central Avenue and Richmond Street/Fairmount Avenue intersections to control traffic during peak periods.

Implementation of Mitigation Measure TRA-1b is expected to reduce the impacts at the intersection of Richmond Street and Central Avenue to a *less-than-significant* level. However, impacts to the remaining intersections would remain *significant and unavoidable*.

### Central Pressure Zone Pipeline (El Cerrito/Richmond)

Because San Pablo Avenue carries a substantial amount of traffic and there are no parallel adjacent roadways of similar classification, it is prudent to keep traffic on San Pablo Avenue to minimize traffic impacts to the surrounding neighborhoods in El Cerrito. For the purposes of this analysis, it is assumed that the pipeline would be developed in the southbound lanes of San Pablo Avenue. To accommodate construction, southbound traffic would be re-routed to the opposing northbound lanes. This would be done by converting one of the northbound lanes to a southbound lane within the construction zone.




SOURCE: DKS

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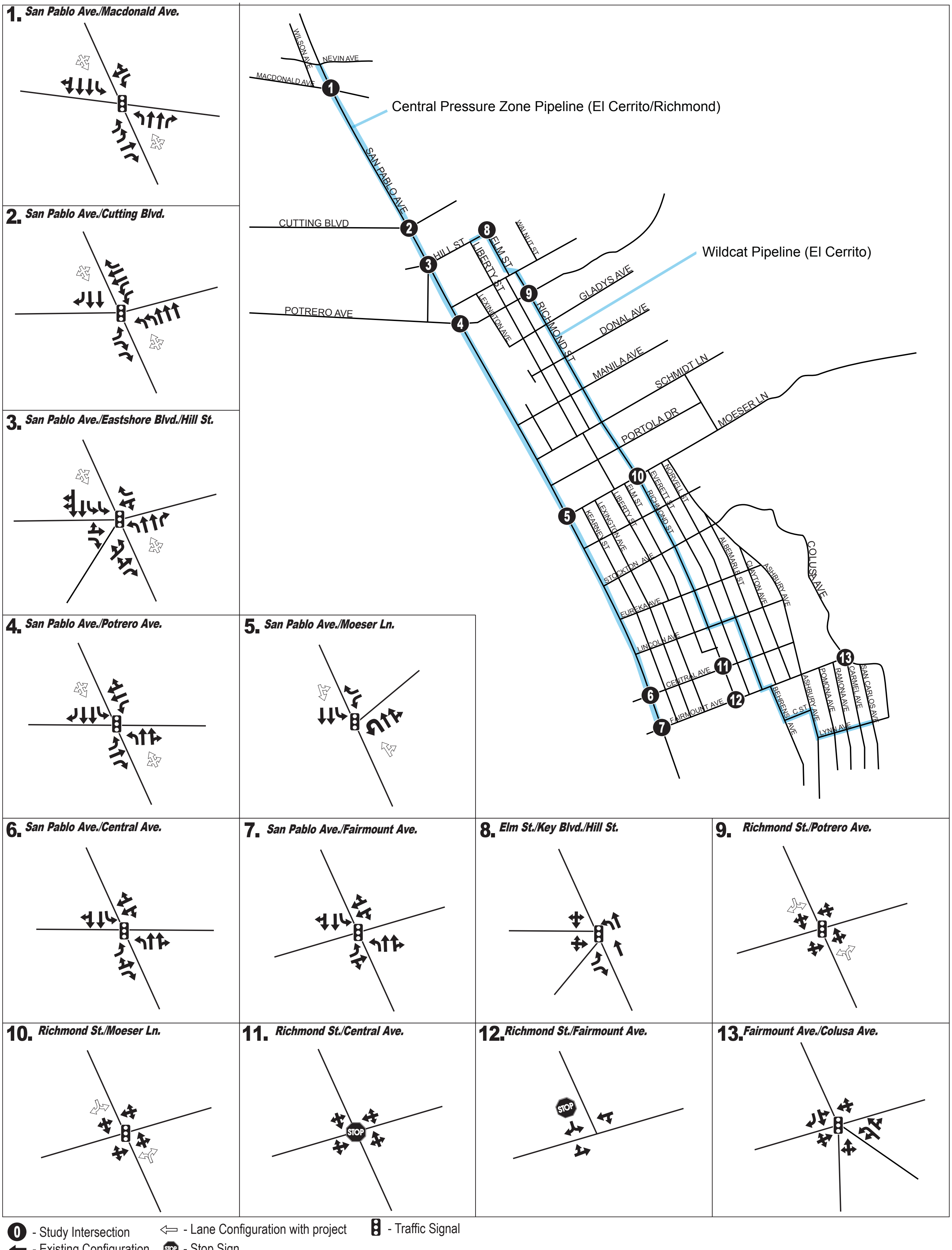
**Figure 3.13-3**
2016 Conditions Turning Movement Volumes
Wildcat Pipeline (El Cerrito/Richmond)




SOURCE: DKS

EBMUD West of Hills Northern Pipelines . 211488

**Figure 3.13-4**
Lane Configurations and Traffic Controls
Wildcat Pipeline (El Cerrito) and Central Pressure Zone Pipeline (El Cerrito/Richmond)

As described above, there are no future plans to widen San Pablo Avenue, and while WCCTAC is exploring the possibility of implementing BRT service along San Pablo Avenue, the project has not been adopted. As such, the present configuration has been used in this analysis. **Figure 3.13-5** shows projected 2022 traffic volumes that were derived for the analysis.

The following intersections were selected for analysis based on the expected impact due to the pipeline construction and associated traffic detour. **Figure TC-8** shows the proposed detour routes for the Central Pressure Zone Pipeline (El Cerrito/Richmond).

1. San Pablo Avenue/MacDonald Avenue
2. San Pablo Avenue/Cutting Boulevard
3. San Pablo Avenue/Eastshore Boulevard/Hill Street
4. San Pablo Avenue/Potrero Avenue
5. San Pablo Avenue/Moeser Lane
6. San Pablo Avenue/Central Avenue
7. San Pablo Avenue/Fairmount Avenue

The future volume projections were used along with the proposed lane configuration through the construction zone to estimate the additional delay associated with the construction project. **Table 3.13-7** is a comparison table that summarizes peak-hour levels of service at all study intersections along San Pablo Avenue under Baseline and Baseline plus Project traffic conditions. Under Baseline plus Project traffic conditions, all seven study intersections would operate at LOS F during both the a.m. and p.m. peak hours, except the San Pablo Avenue / MacDonald Avenue intersection, which would operate at LOS D during the a.m. peak hour. This would be a *significant impact*.

**TABLE 3.13-7**
**PEAK HOUR INTERSECTION LOS CALCULATIONS**
**CENTRAL PRESSURE ZONE PIPELINE (EL CERRITO/RICHMOND)**

| Study Intersection | Traffic Controls | Baseline Conditions | | | | Baseline plus Project Conditions | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM Peak | | PM Peak | | AM Peak | | PM Peak | |
| | | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS |
| 1. San Pablo Ave/MacDonald Ave | Signalized | 8 | A | 6 | A | 37 | D | 120+ | **F** |
| 2. San Pablo Ave/Cutting Blvd | Signalized | 50 | D | 38 | D | 120+ | **F** | 120+ | **F** |
| 3. San Pablo Ave/Eastshore Blvd/Hill St | Signalized | 42 | D | 120+ | F | 120+ | **F** | 120+ | **F** |
| 4. San Pablo Ave/Potrero Ave | Signalized | 13 | B | 50 | D | 120+ | **F** | 120+ | **F** |
| 5. San Pablo Ave/Moeser Ln | Signalized | 11 | B | 44 | D | 120+ | **F** | 120+ | **F** |
| 6. San Pablo Ave/Central Ave | Signalized | 38 | D | 29 | C | 120+ | **F** | 120+ | **F** |
| 7. San Pablo Ave/Fairmount Ave | Signalized | 12 | B | 12 | B | 108 | **F** | 120+ | **F** |

NOTES:
Delay is measured in average seconds per vehicle; LOS = Level of Service
Significant Impacts are shown in **bold** text.
LOS Calculations for the Central Pressure Zone Pipeline (El Cerrito/Richmond) are provided in **Appendix L**


SOURCE: DKS

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**Figure 3.13-5**
2022 Conditions Turning Movement Volumes
Central Pressure Zone Pipeline (El Cerrito/Richmond)

With regard to the duration of impacts, construction of the Central Pressure Zone Pipeline (El Cerrito/Richmond) along San Pablo Avenue is expected to last for approximately twelve weeks depending on the length of the various pipeline segments as indicated in Table 2-4 in Chapter 2. The construction of the tie-ins is expected to last approximately two and a half weeks at each location. Additionally, it is expected to take seven weeks to repave San Pablo Avenue. Therefore, the impacts identified in Table 3.13-7 would be limited to the periods when the construction activities affect the individual intersections. No feasible mitigation measures have been identified to reduce impacts to a less-than-significant level. As a result, the impacts to intersections along San Pablo Avenue would be *significant and unavoidable*.

### Central Pressure Zone Pipeline (Richmond/San Pablo)

The Central Pressure Zone Pipeline (Richmond/San Pablo) is located primarily along 23rd Street in Richmond and San Pablo. In the project area, 23rd Street is a three- to four-lane, north-south mixed residential and commercial arterial street that carries between 14,300 and 25,100 vehicles per day along different portions of the roadway. Two-way traffic would be maintained during construction, with the exception of the southernmost portion of 23rd Street which carries only northbound traffic (travel on this portion would also be maintained). Portions of Brookside Drive would be affected by partial road closures and the intersection of Road 20 and 21st Street would have a full road closure. The Baseline plus Project conditions include detouring traffic from 23rd Street along Rumrill Boulevard, Harbour Way and Macdonald Avenue, and optimization of the signal timing at all of the signalized intersections along the detour route. The proposed detour route is indicated in **Figure TC-13**.

The following intersections were selected for analysis based on the expected impact due to the pipeline construction and associated traffic detour. Intersections located on detour routes are *italicized*.

1. 23rd Street/San Pablo Avenue/Road 20
2. 23rd Street/Market Avenue
3. 23rd Street/Rheem Avenue
4. 23rd Street/Barrett Avenue
5. 23rd Street/Macdonald Avenue
6. *Rumrill Boulevard/San Pablo Avenue*
7. *Rumrill Boulevard/Market Avenue*
8. *Harbour Way/Pennsylvania/10th Street*
9. *Harbour Way/Macdonald Avenue*
10. *Macdonald Avenue/22nd Street*

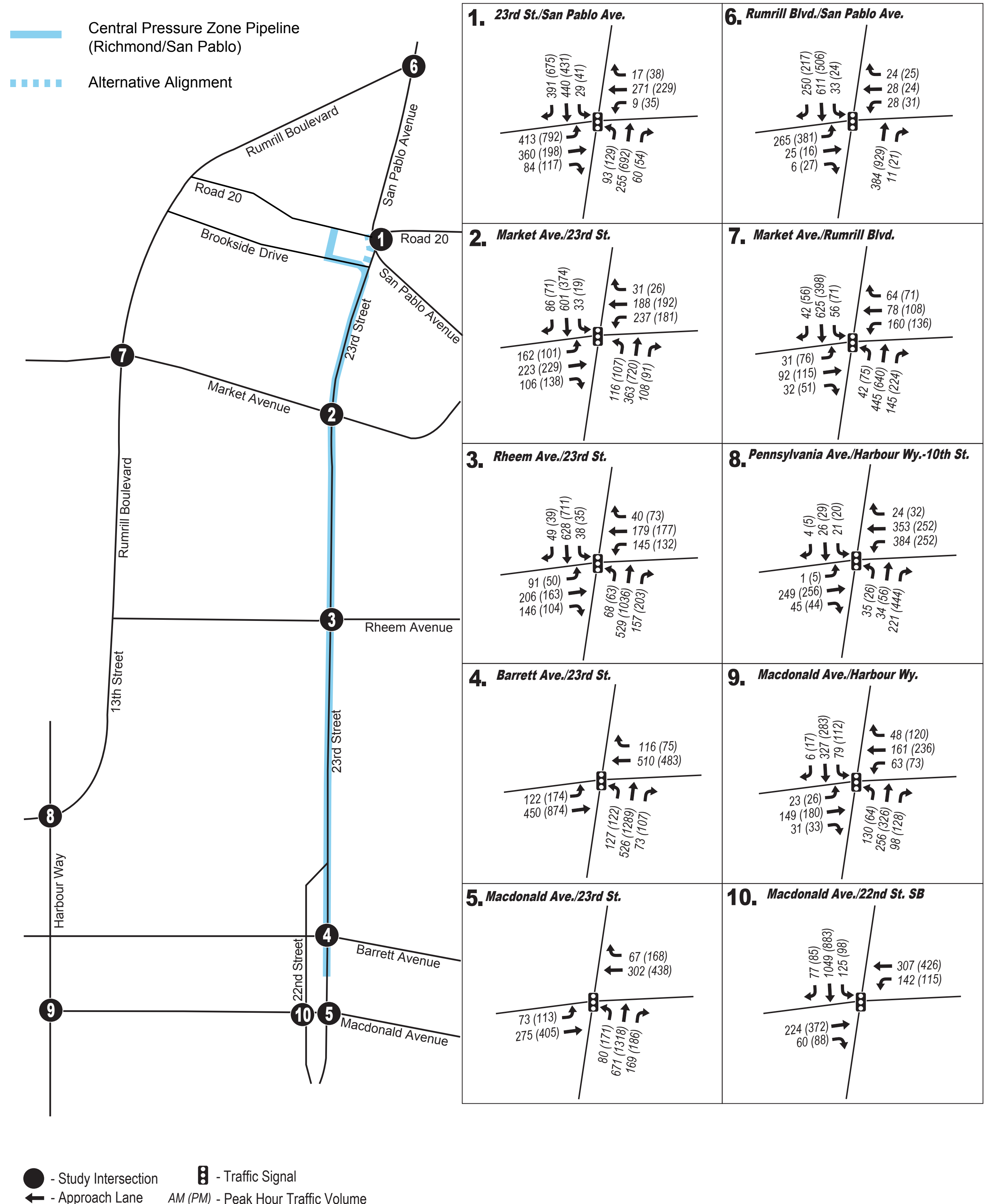
The volume of traffic assumed to use the detour travel route was estimated utilizing an iterative process wherein travel times on each route were evaluated using Synchro 7 and SIMTRAFFIC software modeling tools. Projected baseline ADT volumes and travel times along the study corridor and the detour route were reviewed, then the network was modified to reflect conditions with the lane closures and reduced capacity along the pipeline route. Traffic volumes were then adjusted incrementally to divert traffic along the detour route until the travel times on the two routes were essentially balanced. Through this process an estimate of traffic volumes that will utilize the detour route was estimated and between 10 and 15 percent of the traffic volumes were subtracted from each study intersection and added to the corresponding approaches at the detour route study intersections. This resulted in a decrease in traffic volumes along the construction route and an increase in traffic volumes along the detour route. This condition is likely to develop as motorists decide that greater delays would be encountered along the 23rd Street construction corridor, and therefore choose to avoid the project and follow a posted detour route. The resulting LOS calculations were reviewed to ensure that the amount of traffic assumed to divert to the detour route was reasonable.

**Table 3.13-8** shows the peak-hour intersection LOS results under Baseline Conditions and Baseline plus Project Conditions, based on projected turning movement volumes. The projected 2022 volumes are shown in **Figure 3.13-6**, while the volumes anticipated with the detour in place are indicated in **Figure 3.13-7**. Existing and proposed changed lane configurations and traffic controls are shown in **Figure 3.13-8**. Under Baseline plus Project Conditions, future volume projections were used along with the modified lane configuration through the construction zone to estimate the additional delay associated with the construction project. During the a.m. peak hour, all of the study intersections would operate at LOS D or better. During the p.m. peak hour, the intersections of 23rd Street/San Pablo Avenue/Road 20 and 23rd Street/Rheem Avenue would operate deficiently at LOS F and E, respectively. This would be a *significant* impact. All remaining study intersections would operate at LOS D or better during p.m. peak hour.

**TABLE 3.13-8**
**PEAK HOUR INTERSECTION LOS CALCULATIONS**
**CENTRAL PRESSURE ZONE PIPELINE PROJECT (RICHMOND/SAN PABLO)**

| Study Intersection (all Signalized) | Baseline Conditions | | | | Baseline plus Project Conditions | | | |
|---|---|---|---|---|---|---|---|---|
| | AM Peak | | PM Peak | | AM Peak | | PM Peak | |
| | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS |
| 1. 23rd/San Pablo/Rd 20 | 40 | D | 79 | E | 53 | D | **116** | **F** |
| Mitigated (No Left-turns from San Pablo Avenue) | | | | | n/a | n/a | 78 | E |
| 2. 23rd St/Market Ave | 38 | D | 33 | C | 33 | C | 33 | C |
| 3. 23rd St/Rheem Ave | 10 | A | 13 | B | 19 | B | 68 | **E** |
| Mitigated (No Left-turns from 23rd Street) | | | | | n/a | n/a | 53 | D |
| 4. 23rd St/Barrett Ave | *15* | *B* | *18* | *B* | 16 | B | 25 | C |
| 5. 23rd St/Macdonald Ave | 8 | A | 11 | B | 8 | A | 14 | B |
| *6. Rumrill/San Pablo Ave* | 12 | B | 20 | C | 16 | B | 23 | C |
| *7. Rumrill Blvd/Market Ave* | 17 | B | 15 | B | 18 | B | 15 | B |
| *8. Harbour/Pennsylvania/10th* | 17 | B | 15 | B | 21 | B | 18 | B |
| *9. Harbour/Macdonald Ave* | 26 | C | 33 | C | 29 | C | 45 | D |
| *10. Macdonald Ave/22nd St* | 14 | B | 13 | B | 15 | B | 13 | B |

NOTES:
Delay is measured in average seconds per vehicle; LOS = Level of Service;
Significant Impacts are shown in **bold** text.
LOS Calculations for the Central Pressure Zone Pipeline (Richmond/San Pablo) are provided in **Appendix M**




SOURCE: W-Trans

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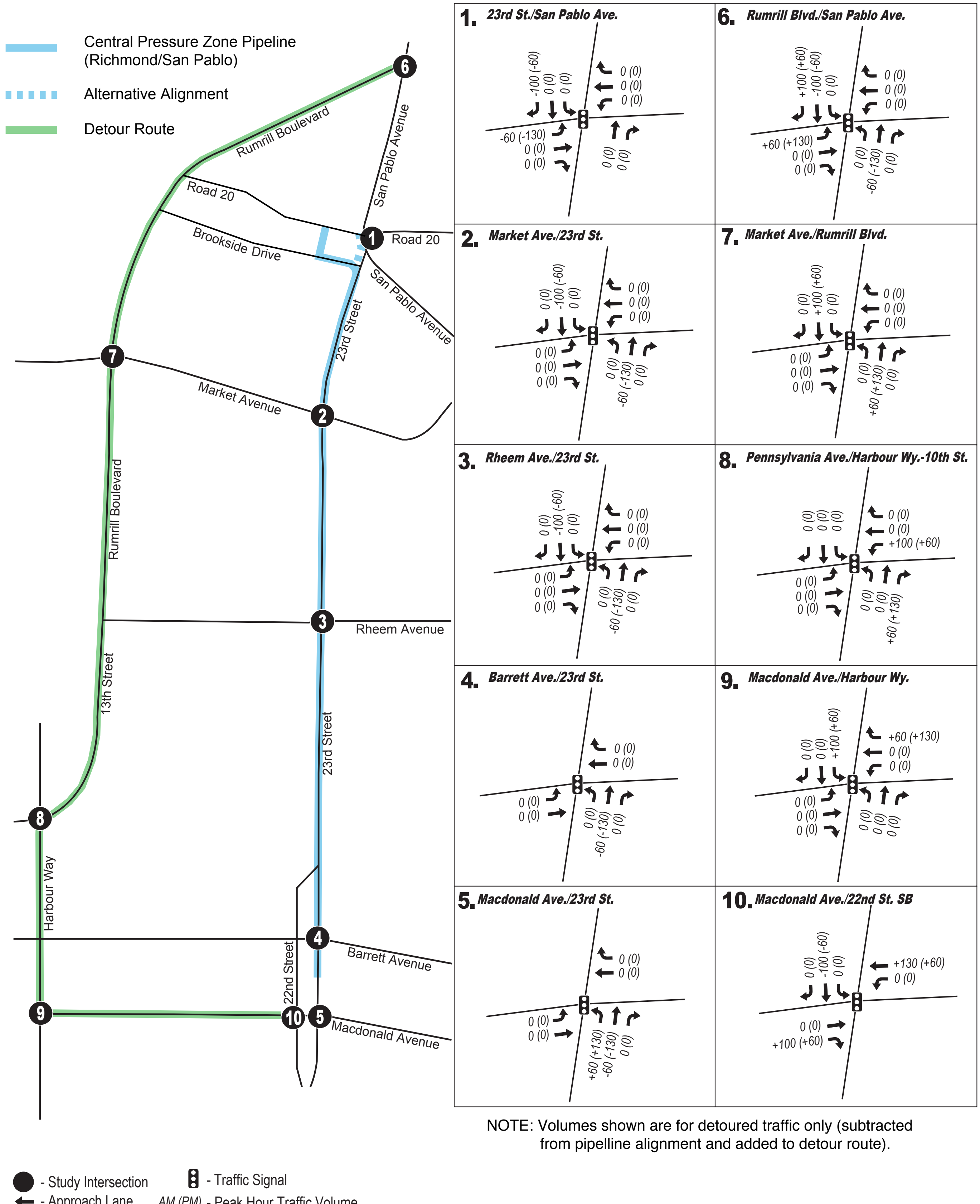
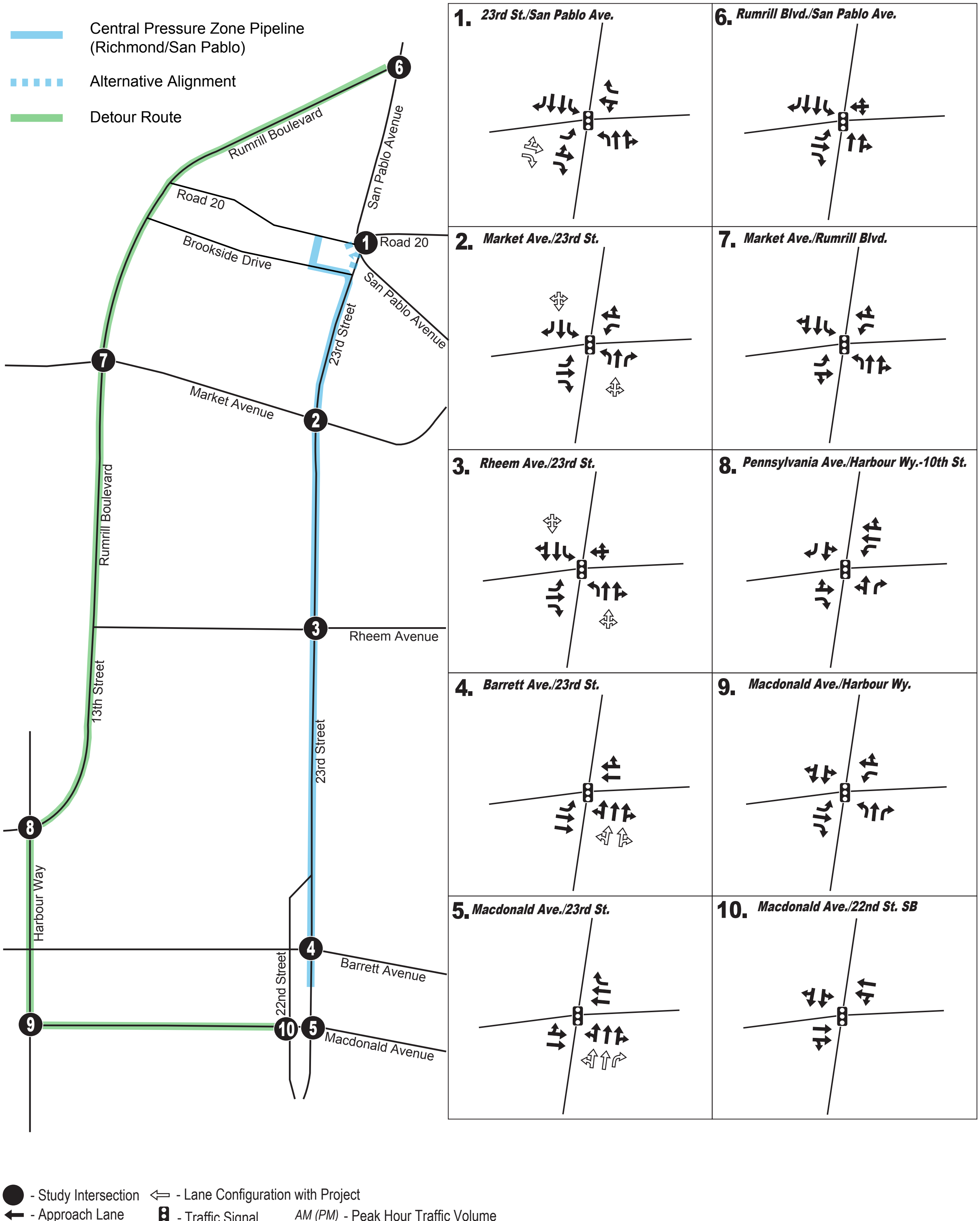
**Figure 3.13-6**
2022 Conditions Turning Movement Volumes
Central Pressure Zone Pipeline (Richmond/San Pablo)




SOURCE: W-Trans

EBMUD West of Hills Northern Pipelines . 211488

**Figure 3.13-7**
Detour Traffic Volumes
Central Pressure Zone Pipeline (Richmond/San Pablo)




SOURCE: W-Trans

EBMUD West of Hills Northern Pipelines . 211488

**Figure 3.13-8**
Lane Configurations and Traffic Controls
Central Pressure Zone Pipeline (Richmond/San Pablo)

The lane closures associated with construction of the pipeline would result in unacceptable operating conditions at the following two locations during the three to four weeks that the lane closures are required for construction at these locations.

- 23rd Street/San Pablo Road/Road 20
- 23rd Street/Rheem Avenue

**Mitigation Measure TRA-1c: Intersection Traffic Control.**

Prohibit left-turns from San Pablo Avenue to 23rd Street or Road 20 during the p.m. peak period when construction activities require lane closures. This can be accomplished using cones and changeable message signs.

**Mitigation Measure TRA-1d: Intersection Traffic Control.**

Prohibit left-turns from 23rd Street to Rheem Avenue during the p.m. peak period when construction activities require lane closures. This can be accomplished using cones and changeable message signs.

Implementation of the recommended mitigation measures will reduce the impact to *less than significant*.

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**Impact 3.13-2: Project construction would potentially have a significant impact on access, including access for emergency vehicles (applies to all pipelines).**

### Wildcat Pipeline (Berkeley)

During construction of the Wildcat Pipeline (Berkeley), Telegraph Avenue and Claremont Avenue would remain open with traffic routed around the work area. All other segments would be closed for the pipeline construction and have traffic detoured during construction hours. Local residents would be permitted access to their residence. Barricades would be used for the road closure, which can easily be removed for emergency vehicle access. The impact on emergency vehicle access therefore would be *less than significant*.

### Wildcat Pipeline (El Cerrito)

For the Wildcat Pipeline (El Cerrito), all roadways would be closed and have all traffic detoured during construction hours. Local residents would be permitted access to their residence. Barricades would be used for the road closure, which can easily be removed for emergency vehicle access. The impact on emergency vehicle access therefore would be *less than significant*.

### Central Pressure Zone Pipeline (El Cerrito/Richmond)

For the Central Pressure Zone Pipeline (El Cerrito/Richmond), the southbound lanes along San Pablo Avenue would be closed during the pipeline construction. One of the northbound travel lanes would be reversed and used as a detour for all southbound traffic during construction hours. As the proposed traffic control scheme would enable two-way traffic flow along San Pablo

Avenue during construction emergency access would be retained, with only minor impacts associated with increased congestion along the pipeline and detour routes. Barricades would be used for the closure of southbound lanes, which can easily be removed for emergency vehicle access. The impact on emergency access therefore would be *less than significant*.

### Central Pressure Zone Pipeline (Richmond/San Pablo)

For the Central Pressure Zone Pipeline (Richmond/San Pablo) construction, traffic would be maintained on 23rd Street along the construction route, though through traffic would be advised of a detour route using changeable message signs or other means as approved by the Cities of Richmond and San Pablo. As there would be no closures, emergency access would be retained throughout the project, with only minor impacts associated with increased congestion along the pipeline and detour routes. Further, there are alternative routes that could be used by emergency responders traveling past the construction area rather than to it. The impact on emergency vehicle access therefore would be *less than significant*.

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**Impact 3.13-3: The proposed Project would not substantially increase hazards due to a design feature or incompatible uses (applies to all pipelines).**

Because the construction duration in any one location or for any pipeline segment is relatively short-term, and road blocks would be removed on a daily basis, barricades and cones (quickly installed and removed) could be used for the road closures and lane channelization. These barricades and cones can easily be removed for emergency access.

Typical construction area signs include advance warning for the construction zone, advance warning for lane closure/merge and changeable message signs to inform motorists about the construction periods and detour routes. Temporary lane delineation would be installed to channelize traffic through the construction zone. No Stopping Any Time (and No Parking Any Time) signs (with the period for the restriction noted) would be installed where needed.

### Wildcat Pipeline (Berkeley)

The road closures and lane channelizations utilizing standard traffic control schemes (consistent with the CA MUTCD) would not result in any hazardous conditions for traffic. Barricades with mounted construction area signs would be used for the road closures at Dana Street, Ward Street, Stuart Street, Hillegass Avenue, Benvenue Avenue, Woolsey Street, and The Uplands. Construction cones would be used to demarcate the construction work zone along Telegraph Avenue and Claremont Avenue. The impact on traffic safety is therefore expected to be *less than significant*.

### Wildcat Pipeline (El Cerrito)

The road closures and lane channelizations utilizing standard traffic control schemes (consistent with the CA MUTCD) would not result in any hazardous conditions for traffic. Barricades with mounted construction area signs would be used for the road closures at Elm Street, Hill Street, and Richmond Street. The impact on traffic safety is therefore expected to be *less than significant*.

### Central Pressure Zone Pipeline (El Cerrito/Richmond)

Barricades with mounted construction area signs would be used for the road closures at San Pablo Avenue. Appropriate warning signs and cones would be installed utilizing standard traffic control schemes (consistent with the CA MUTCD) to guide motorists to use the reversible lanes. The affected traffic signals would be programmed to flash red, and flaggers would be deployed to control traffic through the intersections. As the proposed traffic control scheme would enable two-way traffic flow along San Pablo Avenue during emergency access would be retained, with only minor impacts associated with increased congestion along the pipeline and detour routes. The impact on traffic safety is therefore expected to be *less than significant*.

### Central Pressure Zone Pipeline (Richmond/San Pablo)

Barricades with mounted construction area signs would be used for the road closures on side street approaches to 23rd Street and at the northern pipeline tie-in locations on either Road 20 or San Pablo Avenue. Appropriate warning signs and cones would be installed utilizing standard traffic control schemes (consistent with the CA MUTCD) to guide motorists. As there are no road closures, emergency access would be retained throughout the Project, with only minor impacts associated with increased congestion along the pipeline and detour routes. The impact on traffic safety is therefore expected to be *less than significant*.

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**Impact 3.13-4: Project construction would not substantially limit access to adjacent roadways and land uses due to construction within roadways (applies to all pipelines).**

### Wildcat Pipeline (Berkeley)

The Wildcat Pipeline (Berkeley) is primarily along residential streets. Except for the Telegraph Avenue and Claremont Avenue pipeline segments, all roadways would be closed for construction on a block-by-block basis. While emergency vehicles, garbage collection service, and U.S. Postal Service would be provided access, and local residents would be provided controlled access to and from their homes, the road closure would reduce automobile access, and curb parking would be prohibited during construction hours on affected segments. The pipeline construction would be an inconvenience for residents. Property owners along Telegraph Avenue and Claremont Avenue would be able to access their properties during construction periods, but curb parking would be prohibited on both sides of the roadway through the construction zone. These impacts would be potentially significant to local residents.

**Mitigation Measure TRA-2a: Advance Notification of Construction.**

Residents and business owners located within 300 feet of project construction will be notified in advance of activities requiring road closures about the estimated schedule and duration of the activity. EBMUD will also send emails to individuals on the Project's mailing list to update them prior road closures.

**Mitigation Measure TRA-2b: Road Blocks and Trenches.**

Road blocks will be removed and open trenches covered at the end of the work day on a daily basis to provide access to residents. However, a portion of the parking zones will be retained for the storage of construction equipment on a daily basis.

**Mitigation Measure TRA-2c: Sidewalk Access.**

Sidewalk access will be maintained on one side of the street during construction.

**Mitigation Measure TRA-2d: Alternate Parking Solutions for Residents.**

In the City of Berkeley where their Residential Preferential Parking Program restricts street parking, EBMUD will request the City of Berkeley to provide temporary parking permits for residents to park in other nearby parking permit zones during construction, and EBMUD will, where feasible, work with the owners of parking facilities near the pipeline alignments to provide parking for residents affected by construction.

Implementation of these measures would reduce impacts to a *less-than-significant* level.

### Wildcat Pipeline (El Cerrito)

The Wildcat Pipeline (El Cerrito) is primarily along residential streets. All roadways would be closed for construction on a block-by-block basis. The road closure would limit automobile access, and curb parking would be prohibited in the construction zone during construction periods, which would be an inconvenience for residents. However, parking prohibitions would not significantly affect residents as there is adequate parking in the neighborhood. Implementation of Mitigations Measures 2a-c would ensure that these impacts are *less than significant*.

### Central Pressure Zone Pipeline (El Cerrito/Richmond)

San Pablo Avenue in El Cerrito and Richmond is primarily fronted by neighborhood commercial uses. The prohibition of curb parking on the side open to traffic would have minimal impact as most of the businesses that front San Pablo Avenue have on-site parking lots. However, owners and patrons of businesses within the area of construction along San Pablo Avenue would not be able to directly access businesses located along affected segments during work hours. This would be a *significant and unavoidable* impact.

Implementation of Mitigations Measures 2a-c would reduce some impacts to a less-than-significant level, though impacts on some adjacent businesses would remain *significant and unavoidable*.

### Central Pressure Zone Pipeline (Richmond/San Pablo)

The Central Pressure Zone Pipeline (Richmond/San Pablo) runs along 23rd Street in Richmond and San Pablo, and adjacent land uses primarily consist of low-density commercial and residential areas, with two public schools. Access to 23rd Street via side-street approaches would need to be closed on one side of 23rd Street. These side-streets are mainly residential streets with low traffic volumes and are aligned in a grid network allowing for easy detours around the construction zone without a significant impact to residents. However, the construction zone would require that parking be prohibited on one side of 23rd Street, limiting street parking to the other side of 23rd Street. This parking prohibition would affect residents and commercial businesses by reducing available parking in close proximity to homes and businesses. This would be a significant impact.

Implementation of Mitigations Measures 2a-c would reduce these impacts to a *less-than-significant* level.

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**Impact 3.13-5: Project construction would not substantially impair access to alternative transportation facilities (public transit, bicycle, or pedestrian facilities), although it would temporarily decrease the performance of such facilities (applies to all pipelines).**

### Wildcat Pipeline (Berkeley)

The Wildcat Pipeline (Berkeley) would not directly affect bicycle or transit facilities along Dana Street, Ward Street, Stuart Street, The Uplands, and Benvenue Avenue because the roadways are not designated bicycle or transit routes. However, the closure of Woolsey Street for the Wildcat Pipeline construction will affect the bike route on the roadway. The impact is expected to be minimal because there are numerous alternate routes for bicyclists to bypass the construction zone due to the grid layout of the streets in the vicinity of Woolsey Street. Pedestrian access would not be affected as at least one sidewalk would be accessible for pedestrian traffic during construction, and pedestrians would be able to walk past the pipeline construction area to cross the roadway at locations where there are no construction activities. Because the estimated rate of pipeline installation is 80 to 200 feet per day, pedestrians would not have to walk more than one or two blocks to get around the construction zone.

Telegraph Avenue has Class II bicycle lanes, which would be encroached upon for channeling automobile traffic through the construction work zone. As identified within the proposed traffic control plan, temporary “share the road signs” would be installed at locations where bicycle lanes are encroached upon to accommodate automobile traffic traveling through the construction zone.

However, Telegraph Avenue (Lines 1 and 1R) and Claremont Avenue (Lines E and 49) serve AC Transit bus lines. The travel time for transit through the construction zone is expected to increase in the southbound direction due to temporary elimination of one travel lane. In addition, bus stops located in the construction zone may need to be temporarily closed or relocated.

> **Mitigation Measure TRA-3a: Notification of Transit Changes.**
>
> EBMUD will coordinate with AC Transit to provide the notification to transit patrons. EBMUD will provide AC Transit with 14 days notice of bus stop closures. AC Transit will communicate alternate bus stop locations to their customers.

With implementation of Mitigation Measure TRA-3a as well as planned traffic control schemes, the impacts on transit, bicyclists and pedestrians would be *less than significant*.

### Wildcat Pipeline (El Cerrito)

Elm Street and Richmond Street would be closed to traffic, which would limit bicycle access, but the impact to bicyclists is considered less-than-significant as there are numerous alternate routes in the neighborhood which can be used to bypass construction activity. In addition, as identified within the proposed traffic control plan, construction area warning signs would be installed in advance of the work zones that would alert cyclists about road closures and traffic detours.

Access to the sidewalks would be maintained on one side of the street during construction. Pedestrians would walk past the pipeline construction area to cross the roadway at locations where there are no construction activities. Because the estimated rate of pipeline installation is 80 to 200 feet per day, pedestrians would not have to walk more than one or two blocks to get around the construction zone. Impacts would be less than significant.

AC Transit Lines G and 684 run along Hill Street, Elm Street, and Richmond Street, and AC Transit Line 25 runs along Fairmount Avenue, therefore transit operation would be adversely affected by the Wildcat Pipeline (El Cerrito). AC Transit Line G and 25 would need to be detoured with the closure of Elm Street, Richmond Street and Fairmount Avenue for the pipeline construction.

> **Mitigation Measure TRA-3b: AC Transit Coordination.**
>
> EBMUD will coordinate with AC Transit to relocate bus stops and/or reroute affected transit services via parallel streets during construction. This would minimize the distance that bus patrons would need to walk to access the buses due to bus stops on affected streets being temporarily closed.

With implementation of Mitigation Measure TRA-3a and TRA-3b, as well as planned traffic control schemes, the impacts on transit, bicyclists and pedestrians would be *less than significant*.

### Central Pressure Zone Pipeline (El Cerrito/Richmond)

The pipeline construction on San Pablo Avenue would adversely affect travel time through the construction zone for transit AC Transit Lines 72, 72M, 667, 668, 800. Additionally, some of the bus stops along the closed segments would be inaccessible. While implementation of TRA-3a would provide for coordination of bus stop closures with AC Transit, this is considered a potentially *significant and unavoidable* impact.

> **Mitigation Measure TRA-3c**: **AC Transit Coordination.**
>
> EBMUD will coordinate with AC Transit to relocate bus stops and/or reroute affected transit services via parallel streets during construction along San Pablo Avenue. This would minimize the distance that bus patrons would need to walk to access the buses due to bus stops on San Pablo Avenue being temporarily closed.

Sidewalk access would be maintained on both sides of San Pablo Avenue during construction, and pedestrians would walk past the pipeline construction area to cross the roadway at locations where there are no construction activities. Marked pedestrian crosswalks would need to be closed during construction periods to allow pipeline construction across the crosswalks along San Pablo

Avenue. Distances between marked crosswalks along San Pablo Avenue range from 200 to 700 feet.

**Mitigation Measure TRA-3d: Crosswalks.**

Where possible, the contractor will implement staged construction across the intersections along San Pablo Avenue to make either the north or south crosswalk available at any one time during construction. This would minimize the need for pedestrians to walk an entire block to use the adjacent crosswalk to cross San Pablo Avenue.

There are no striped bicycle lanes on San Pablo Avenue. Currently bicyclists share the roadway with motorists. Temporary "share the road" signs would be mounted within the construction zone along San Pablo Avenue. Alternatively, the contractor will obtain a temporary permit for bicyclists to use the sidewalks to bypass the construction zones.

**Mitigation Measure TRA-3e: Bicycle Traffic Management.**

The contractors will mount temporary "share the road" signs within the construction zone along San Pablo Avenue, or will obtain a temporary permit to allow cyclists to use the sidewalk to bypass the construction area where allowed by the local jurisdiction.

While implementation of Mitigation Measures TRA-3a, and TRA-3c through TRA-3e would reduce impacts to the extent feasible; construction on San Pablo Avenue would result in *significant and unavoidable* delays to AC Transit Lines.

#### Central Pressure Zone Pipeline (Richmond/San Pablo)

Construction of the Central Pressure Zone Pipeline (Richmond/San Pablo) would adversely affect transit travel time to AC Transit line 74 along 23rd Street through the construction zone. Additionally, some of the bus stops along the closed segments would be inaccessible to transit, adversely affecting transit riders utilizing those bus stops.

Bicycle lanes along 23rd Street between San Pablo Avenue and Maricopa Avenue would be encroached upon within the construction zone, and bicyclists would be required to share a travel lane with vehicular traffic to pass the construction zone.

Marked pedestrian crosswalks would need to be closed during construction periods to allow pipeline construction across the crosswalks. Distances between marked crosswalks along 23rd Street range from 50 to 800 feet, with the majority of crosswalks approximately 300 to 500 feet apart. However, at two crosswalk locations (Garvin Avenue and Hellings Avenue), closure of the crosswalk would require pedestrians wishing to cross 23rd Street to detour in excess of five minutes. Similar conditions would occur if closely-spaced crosswalks were to close simultaneously for construction, including those at Dover Avenue, between Visalia Avenue and Lincoln Avenue, and between Grant Avenue and Clinton Avenue. This is considered a potentially significant impact.

To mitigate this impact, notice of crosswalk closure at Garvin Avenue and Hellings Avenue would allow pedestrians who would otherwise use the crosswalks to plan accordingly and adjust their travel behavior due to construction activity. Additionally, contractors will minimize or avoid simultaneous closure of multiple closely-spaced crosswalks along 23rd Street at Dover Avenue, between Visalia Avenue and Lincoln Avenue, and between Grant Avenue and Clinton Avenue.

**Mitigation Measure TRA-3f: Road Closure Notification.**

During Garvin Avenue and Hellings Avenue closures, notification will be provided through signing that pedestrians need to use alternative locations to cross 23rd Street.

**Mitigation Measure TRA-3g: Sidewalk Closure.**

Contractors will minimize or avoid closing multiple crosswalks at closely-spaced intersections at Dover Avenue, between Visalia Avenue and Lincoln Avenue, and between Grant Avenue and Clinton Avenue.

Implementation of Mitigation Measures TRA-3a, and TRA-3f through TRA-3g would reduce impacts to *less than significant*.

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## References

California Department of Transportation (Caltrans), *Highway Design Manual*, Chapter 1000 – Bikeway Planning and Design, 2012a.

California Department of Transportation (Caltrans), *California Manual on Uniform Traffic Control Devices for Streets and Highways*, amended January 13, 2012b.

California Department of Transportation (Caltrans). *2010 Traffic Volumes on California State Highways*. Available online at http://traffic-counts.dot.ca.gov/index.htm, 2011.

City of Berkeley, *City of Berkeley Bicycle Master Plan*, December 1998 (updated 2005).

City of Berkeley, *City of Berkeley General Plan: A Guide for Public Decision-Making*, adopted 2003.

City of Berkeley, *Berkeley Bicycle Plan*, February 22, 2005.

City of El Cerrito, *City of El Cerrito 1999 General Plan*, 1999.

City of San Pablo, *City of San Pablo – San Pablo Avenue Specific Plan*, September 2011a.

City of San Pablo, *City of San Pablo General Plan 2030*, adopted April 2011b.

City of Richmond, *City of Richmond General Plan 2030 Final Public Draft Review*, August 2011a.

City of Richmond, *City of Richmond Bicycle Master Plan*, October 2011b.

Contra Costa Transportation Authority's *West County Action Plan, 2009*

Dowling Associates, Inc., *23rd Street Road Diet Traffic Study*, May 2010.

United States Federal Government Office of Secretary of Transportation, *Code of Federal Regulations – Title 49: Transportation*. Available online at: http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?sid=da16779bb9facae104a40df66c3b2bae&c=ecfr&tpl=/ecfrbrowse/Title49/49cfrv2_02.tpl#180; accessed April 10, 2012.

# CHAPTER 4
# Project Alternatives

## 4.1 Approach to Analysis and Overview

Chapter 3 of this EIR presents detailed evaluations of the four proposed pipeline segments as well as two optional segments at an equal level of detail. This chapter describes and evaluates other alternatives to the proposed pipeline segments (including the required No Project Alternative), describes the alternatives screening process and alternatives eliminated from consideration, and compares the environmental merits of the alternatives.

### 4.1.1 CEQA Requirements for Alternatives Analysis

The CEQA Guidelines require EIRs to describe and evaluate a reasonable range of alternatives to a project, or to the location of a project, which would feasibly attain most of the basic project objectives and avoid or substantially lessen significant project impacts. The CEQA Guidelines, Section 15126.6, set forth the following criteria for alternatives:

- ***Identifying Alternatives***. The range of alternatives is limited to those that would avoid or substantially lessen any of the significant effects of the project, are feasible, and would attain most of the basic objectives of the project. Factors that may be considered when addressing the feasibility of an alternative include site suitability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, economic viability, and whether the proponent can reasonably acquire, control, or otherwise have access to an alternative site. An EIR need not consider an alternative whose impact cannot be reasonably ascertained and whose implementation is remote and speculative. The specific alternative of "no project" must also be evaluated along with its impact.

- ***Range of Alternatives.*** An EIR need not consider every conceivable alternative, but must consider a reasonable range of alternatives that will foster informed decision-making and public participation. The "rule of reason" governs the selection and consideration of EIR alternatives, requiring that an EIR set forth only those alternatives necessary to permit a reasoned choice. The lead agency (EBMUD) is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasons for selecting those alternatives.

- ***Evaluation of Alternatives.*** EIRs are required to include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the project. Matrices may be used to display the major characteristics of each alternative and environmental effects of each alternative. If an alternative would cause one or more significant effects not caused by the project as proposed, the significant effects of the alternative must be discussed but in less detail than the significant effects of the project.

### 4.1.2 Approach to Alternatives Analysis

Sources of alternatives to be considered included alternatives suggested in EBMUD planning reports prepared for the West of Hills area, suggestions made in response to the NOP and at public meetings held for the West of Hills Northern Pipelines Project, and EIR preparers (based on the environmental impacts described in Chapter 3). EBMUD planning reports used to develop potentially feasible alternatives that could meet the objectives and engineering constraints associated with the West of Hills Northern Pipelines Project include the *West of Hills Master Plan* (EBMUD, 2010) and the *West of Hills Northern Pipelines Alignment Study* (Alignment Study) (EBMUD, 2012). A range of alternatives were considered, and those that did not meet most of the basic project objectives, were found to be infeasible, or that did not reduce the project's environmental impacts were eliminated. Section 4.6 presents those alternatives retained for consideration (in addition to the four proposed routes and two options presented in Chapter 2, *Project Description*). Section 4.5 describes the alternatives screening process, alternatives eliminated and the reasons for their elimination.

The EBMUD Board of Directors will review and consider the information contained in this EIR prior to its decision to approve, disapprove, or modify the Project.

## 4.2 EBMUD Alternatives Screening Process

This section summarizes the alternatives screening process for the West of Hills Northern Pipelines Project, discusses the screening criteria used and identifies alternatives that were eliminated.

### 4.2.1 EBMUD Project Development

The pipelines proposed under the West of Hills Northern Pipelines Project were originally identified in the *West of Hills Master Plan*, a regional master plan that addresses water treatment plant, storage and transmission capacity for the West of Hills service area. The *West of Hills Master Plan* analyzed transmission and storage operations in light of future demands and changing storage requirements and determined the system improvements and operational changes needed to ensure reliable water service to the West of Hills customers over the long term. Improvements identified included new and revised storage, new major transmission pipelines, new or upgraded pumping plants, and an array of modifications to some of the water treatment plants. Identified projects are based on demands forecasted in EBMUD's *2040 Demand Study* (EBMUD, 2009) and are phased to first support a future maximum day demand of 259 mgd. If growth in demand is observed, a second phase of projects would be implemented to meet a maximum day demand of 315 mgd.

The West of Hills Northern Pipelines Project represents the four pipeline improvements within the *West of Hills Master Plan* that would improve transmission capacity north of the Claremont Tunnel to the Central and Aqueduct Pressure Zones and the upper pressure zone cascades served by the Wildcat Aqueduct. The *West of Hills Master Plan* determined sizing and points of connection for the four pipelines segments proposed as part of the West of Hills Northern

Pipelines Project. Subsequently, the Alignment Study was completed to determine the preferred alignment for each of the four pipelines between the identified connection points.

## Alignment Study Screening Process

The alternatives analysis carried out in the Alignment Study consisted of an initial screening evaluation. The initial screening included review of aerial photos and maps, field visits and meetings with local cities and agencies and was used to eliminate alternatives that did not meet project objectives (see Table 2-1 in Chapter 2, *Project Description*, for project objectives). After the initial screening, evaluations of existing utilities, potential geologic hazards, traffic counts, pavement moratoriums and project costs were used to refine and compare viable alternatives and determine the preferred alignments. **Table 4-1** lists the general evaluation criteria used in the Alignment Study. EBMUD's Engineering Standard Practices (see Table 2-6 in Chapter 2, *Project Description*) were also used in the general evaluation criteria development of the alignments and to estimate construction costs (EBMUD, 2012).

**TABLE 4-1**
**GENERAL EVALUATION CRITERIA**

| Major Criteria | Sub-Criteria | Description |
|---|---|---|
| System Operations | Alignment Bends and Turns | Relative number of high and low points<br>Relative number of horizontal deflections |
| | Reliability | Geologic features affecting pipeline integrity |
| Geologic Considerations | Landslides | Relative number and proximity of slide areas |
| | Active Fault | Relative potential for crossing known active fault |
| | Liquefaction | Relative potential for liquefaction<br>Relative length susceptible to liquefaction |
| Environmental Considerations | Land Use and Planning Considerations | Degree of public disruption from construction |
| | Biological Impacts | Impacts on sensitive habitats<br>Impacts on threatened and endangered species |
| | Traffic Impacts | Disruption of traffic flow<br>Impacts to traffic safety<br>Vehicle access through construction area |
| | Public Safety | Impacts to public safety |
| Implementation Considerations | Interagency Agreements | Encroachment permits from agencies<br>Resource agency permits in sensitive areas (e.g. California Department of Fish and Game) |
| | Easement Acquisition | Risk of relocation of existing underground utilities<br>Relative number and types of private easements |
| | Construction Permits | Relative number of construction permits<br>Relative difficulty in obtaining permits |
| Construction Obstacles | Construction Easement Width / Staging | Relative width of construction easement<br>Length of tight easement areas<br>Staging areas |
| | Existing Utility Crossings | Density of existing utilities along alignment<br>Number of large utility crossings (> 36-inch) |
| Economic Considerations | Capital Cost | Construction costs |

**Tables 4-2** through **4-5** describe the general characteristics of the alternatives that were identified and evaluated in the Alignment Study. The alternative alignments are shown in **Figures 4-1** through **4-4**.

## Selection of EBMUD Preferred Alternative

EBMUD applied the general evaluation criteria presented above in Table 4-1 to each alignment. Tables 4-2 through 4-5 summarize the evaluation of alternative alignments based on these criteria. The alignment alternatives were ranked based on qualitative evaluations of the screening criteria with additional consideration to avoid risks (e.g. geologic hazards and high priority utility lines), to increase ease of construction and to reduce environmental impacts and costs. The following is a brief summary of reasons for the selection of the preferred alignments, based on the evaluation criteria described above, that was conducted within the Alignment Study (see Tables 4-2 through 4-5 for additional review of alternative alignments):

- ***Wildcat Pipeline (Berkeley).*** The proposed alternative (Alternative 4) is the second shortest alignment. Alternative 4 avoids Derby Street as requested by the City of Berkeley, in order to protect existing unreinforced storm drains. It also avoids College Avenue, a majority of Telegraph Avenue, and a pavement moratorium on Ellsworth Street.
- ***Wildcat Pipeline (El Cerrito).*** The proposed alternative (Alternative 1) is the shortest and most straight forward alignment. The alignment has sufficient space for the pipeline, is not under a pavement moratorium and does not parallel any hazardous pipelines or landslide risk areas.
- ***Central Pressure Zone Pipeline (El Cerrito/Richmond).*** The proposed alternative (Alternative 1) is the shortest alignment and would not require full closure of San Pablo Avenue. It also avoids nearby landslide risk areas and alignment options that are already congested with underground utilities.
- ***Central Pressure Zone Pipeline (Richmond/San Pablo).*** The proposed alternative (Alternative 4) is the second shortest alignment and crosses San Pablo Creek at a less visually sensitive location. This alignment also minimizes impacts to residential areas and avoids areas of congested utilities.

## Additional Alternatives Analyzed in the EIR

In addition to the preferred pipeline alignments, EBMUD identified alternative segments of two pipelines that warranted additional environmental analysis to inform choice of route.

### Wildcat Pipeline (Berkeley) Benvenue Avenue Option

Routing the pipeline down Benvenue Avenue between Woolsey Street and Stuart Street provides an alternative to utilizing Hillegass Avenue. During initial review there was not a clear advantage of routing the pipeline along Hillegass Avenue rather than Benvenue Avenue. As a result, EBMUD included the Benvenue Avenue option, which is evaluated at an equal level of detail in Chapter 3.

**TABLE 4-2**
**WILDCAT PIPELINE (BERKELEY)**
**ALIGNMENT ALTERNATIVES COMPARISON MATRIX**

| | ALTERNATIVE 1 | ALTERNATIVE 2 | ALTERNATIVE 3 | ALTERNATIVE 4 (Proposed Alignment) |
|---|---|---|---|---|
| **ALIGNMENT DESCRIPTION** | | | | |
| City Location | Berkeley | Berkeley | Berkeley | Berkeley |
| Pipeline Length | 8,200 lineal feet | 9,350 lineal feet | 8,900 lineal feet | 8,200 lineal feet |
| Number of Customers Along Alignment[1] | 233 | 286 | 225 | 234 |
| Schools Affected | Behind Willard Middle School | Le Conte Elementary | Willard Middle School | Willard Middle School |
| **SCREENING CRITERIA** | | | | |
| Materials Engineering Recommendation | Acceptable | Acceptable | Acceptable | Acceptable |
| Liquefaction Potential | Low | Low | Low | Low |
| Cross Active Fault | No | No | No | No |
| Near Landslide Area | No | No | No | No |
| Traffic[2] | Low<br>Majority of the alignment is through local roads; relatively short length is through a collector (Claremont Ave.); crosses three major roads (College, Ashby, and Telegraph). | Medium<br>Majority of the alignment is through local roads; relatively short length is through a collector (Claremont Ave.); another short length is on a major road (College Ave.); crosses two major roads (Ashby and Telegraph). | High<br>A significant portion of the alignment is on a major road (Telegraph Ave.); a relatively short length is through a collector (Claremont Ave.); crosses two major roads (College Ave and Ashby) | Medium<br>Majority of the alignment is through local roads; relatively short length is through a collector (Claremont Ave.); another short length is on a major road (Telegraph Ave.); crosses two major roads (Ashby and College Ave.). |
| Utility | Alignment parallels to a 30-inch by 30-inch unreinforced concrete horseshoe in Derby St. between Hillegass Ave. and Dana St. | Alignment parallels to a PG&E 16-inch gas line in Russell St between Benvenue Ave and Ellsworth St | Alignment parallels to a PG&E 16-inch gas line in Telegraph Ave between Prince St and Webster St | No high pressure gas lines in parallel with alignment. |
| Typically Required Right-of-Way/ Construction Corridor | 30 feet<br>Public ROW | 30 feet<br>Public ROW | 30 feet<br>Public ROW | 30 feet<br>Public ROW |
| Available Curb to Curb Width | 28 feet to 56 feet<br>(36 feet typical) | 28 feet to 56 feet<br>(36 feet typical) | 28 feet to 68 feet<br>(36 feet typical) | 28 feet to 56 feet<br>(36 feet typical) |
| Available Clearance for Trenching[3] | 8 feet, 8-inches | 6 feet, 3-inches | 7 feet, 8-inches | 8 feet, 8-inches |
| Recommended Road Closures[4] | Parkside Drive, Woolsey Street, Hillegass Avenue, Derby Street, and Dana Street | Parkside Drive, Prince Street, College Avenue, Webster Street, Benvenue Avenue, Russell Street, Ellsworth Street, and Parker Street | Parkside Drive, Woolsey Street, Ward Street, and Dana Street | Parkside Drive, Woolsey Street, Hillegass Avenue, Stuart Street, and Dana Street |
| Production Rate[5] | 80 – 200 LF/day | 80 – 200 LF / day | 80 – 200 LF / day | 80 – 200 LF / day |
| Construction Duration[6] | 9 to 12 months | 9 to 12 months | 9 to 12 months | 9 to 12 months |
| Estimated Project Cost[7] | $ 8.8 million | $ 9.9 million | $ 9.3 million | $ 8.9 million |
| Overall Ranking | 2 | 4 | 3 | 1 |
| Summary Comments | This alignment is the shortest alignment and is very similar to the preferred alignment. The City of Berkeley requested that Derby Street be avoided due to presence of an unreinforced concrete storm drain. | This alignment is the longest potential alignment and would require the closure of College Avenue. Other negatives include a 16-inch gas line Russell Street and a moratorium on Ellsworth Street. | This alignment is about 650 feet longer than the preferred alignment. It uses Telegraph Avenue which is a major business district. | This alignment is the preferred alignment, because it is the second shortest alignment, while still avoiding Derby Street. The work in front of Willard Middle School will need to be done during the summer. |

NOTES
1 Estimated based on number of taps within 75 feet of the alignment.
2 Ranked based on data shown on City of Berkeley Traffic Engineering Average Total Daily Traffic Volume map.
3 Minimum wall-to-wall clearance between existing underground utilities determined based on the critical cross sections prepared (3 for each alignment alternative). Required trench width is 5 feet, 8-inches
4 Roads that are less than 40 feet curb to curb need to be closed because required construction ROW for 48-inch main is 30 feet and a minimum 10 foot travel width is required to maintain alternate one-way traffic flow.
5 Source: Distribution System Engineering's email to Angelina Wai from Marisa Boyce dated 4/26/2011 and follow-up phone conversation (based on open-cut method installation for 48-inch pipeline once contractor is mobilized).
6 Includes 6 months for mobilization and demobilization. Assumes normal 8 hours workday, typical construction hours between 7:00am to 7:00pm (per ESP 494 – Mitigation Guidelines for Major Capital Projects).
7 Project cost estimated in April 2011 dollars and included 15 percent design, 15 percent construction management, and 20 percent contingency.

**TABLE 4-3**
**WILDCAT PIPELINE (EL CERRITO)**
**ALIGNMENT ALTERNATIVES COMPARISON MATRIX**

| | ALTERNATIVE 1 (Proposed Alignment) | ALTERNATIVE 2 | ALTERNATIVE 3A | ALTERNATIVE 3B | ALTERNATIVE 4 |
|---|---|---|---|---|---|
| **ALIGNMENT DESCRIPTION** | | | | | |
| City Location | El Cerrito | El Cerrito | El Cerrito | El Cerrito | El Cerrito |
| Pipeline Length | 13,500 lineal feet | 15,000 lineal feet | 15,000 lineal feet | 14,200 lineal feet | 14,100 lineal feet |
| Number of Customers Along Alignment[1] | 430 | 461 | 404 | 374 | 429 |
| Schools Affected | Windrush School | N/A | Windrush School<br>Prospect Sierra School<br>Portola Middle School [2] | Windrush School<br>Prospect Sierra School<br>Portola Middle School [2] | Windrush School |
| **SCREENING CRITERIA** | | | | | |
| Materials Engineering Recommendation | Acceptable | Acceptable | High Landslide Risk | High Landslide Risk | Acceptable |
| Liquefaction Potential | Low | Low | Low | Low | Low |
| Cross Active Fault | No | No | No | No | No |
| Near Landslide Area (per EBMUD Geologic Hazards Assessment) | Yes<br>Richmond St – between Waldo and Eureka<br>Norvell St – between Lincoln and Central | Yes<br>Liberty St – between Waldo and Eureka | Yes<br>Avis Dr at Moeser Ln. to Colusa Ave at Susan Ave | Yes<br>Avis Dr at Moeser Ln. to Colusa Ave at Susan Ave | Yes<br>Richmond St – from Waldo to Eureka<br>Norvell St – from Lincoln to Central |
| Near Landslide Risk Area (per City of El Cerrito Study) | Yes<br>Richmond St – between Gladys and Donal, and between Schmidt and Moeser | Yes<br>Richmond St - between Schmidt and Moeser | Yes<br>Majority of the alignment | Yes<br>Majority of the alignment | Yes<br>Richmond St – between Gladys and Donal, and between Schmidt and Moeser;<br>Everett St - between Gladys and Donal; |
| In Very High Fire Hazard Zones (per City of El Cerrito Study) | No | No | Yes<br>Colusa Ave and Avis Dr | Yes<br>Colusa Ave, Avis Dr, and Navellier St. | No |
| Traffic[3] | High<br>Majority of the alignment is through Richmond St, Elm St, and Hill St, which are minor arterials. | Low<br>Majority of the alignment is along residential streets. A relative short length is through Richmond St, Moeser Ln., and Hill St, which are minor arterials. | Medium<br>Half of the alignment is through Colusa Ave, which is a collector road; and half of the alignment is along Moeser Ln., Elm St, and Hill St that are minor arterials. | Medium to High<br>Majority of the alignment is through Colusa Ave and Navellier St, which are collector roads. | Medium / High<br>Majority of the alignment is through Richmond St, Elm St, and Hill St, which are minor arterials. |
| Utility | Alignment crosses 115 kV electric lines at the intersections of Richmond St/ Schmidt Ln. and Hill Street / Liberty St | Alignment parallels to a 115 kV electric line in Liberty St between Manila Ave and Blake St, and it crosses a 115 kV electric line at intersection of Richmond St /Schmidt Ln. | Alignment parallels to a 115 kV electric line in Schmidt Ln. between Richmond St and Everett St, and it crosses a 115 kV electric line at intersection of Richmond St /Schmidt Ln. | No major interference along this alignment | No major interference along this alignment |
| Typically Required Right-of-Way/ Construction Corridor | 25 feet<br>Public ROW | 25 feet<br>Public ROW | 25 feet<br>Public ROW | 25 feet<br>Public ROW | 25 feet<br>Public ROW |
| Available Curb to Curb Width | 28 feet to 40 feet<br>(30 feet typical) | 24 feet to 40 feet<br>(30 feet typical) | 30 feet to 54 feet<br>(30 feet typical) | 28 feet to 40 feet<br>(33 feet typical) | 28 feet to 40 feet<br>(30 feet typical) |
| Available Clearance for Trenching[4] | 8 feet, 6-inches<br>south side of Blake St | 4 feet, 8-inches<br>east side of Lexington Ave | 9 feet, 6-inches<br>north side of Hill St | 9 feet, 6-inches<br>north side of Blake St | 8 feet, 6-inches<br>south side of Blake St |
| Recommended Road Closures[5] | The entire alignment, except Key Route Boulevard between Lynn Avenue and C Street | The entire alignment, except Key Route Boulevard between Lynn Avenue and B Street | The entire alignment, except Moeser Lane between Avis Drive and Everett Street | The entire alignment | The entire alignment, except Key Route Boulevard between Lynn Avenue and C Street |
| Production Rate[6] | 80 – 200 LF / day | 80 – 200 LF / day | 80 – 200 LF / day | 80 – 200 LF / day | 80 – 200 LF / day |
| Construction Duration [7] | 9 to 14 months | 10 to15 months | 10 to 15 months | 10 to 14 months | 10 to 14 months |
| Estimated Project Cost[2] | $10.6 million | $12.6 million | $13.1 million | $13.4 million | $ 11.5 million |
| OVERALL RANKING | 1 | 3 | 4 | 5 | 2 |
| SUMMARY COMMENTS | This alignment is the preferred alignment because it is the shortest and the most straight forward alignment. This alignment does not parallel to any hazardous pipeline. The work in front of Windrush School will need to be done during school summer break. | This alignment is 1,500 LF longer than the preferred alignment. It parallels to an underground 115 kV electric line for 2,440 LF in Liberty St between Manila Ave and Blake St. This section of Liberty Street has an existing pavement moratorium that expires in November 2015. Lexington Ave between Blake St and Hill St may not have sufficient clearance for the new pipeline. | This alignment is also 1,500 LF longer than the preferred alignment. Approximately 4,400 LF of the alignment is near landslide risk area. The work in front of the three schools will need to be done during school summer break. Furthermore, Colusa Ave and Avis Drive are winding roadways with frequent changes in horizontal grades. | This alignment is very similar to Alternative 3A – a majority of the alignment is along winding roadways with frequent changes in horizontal grade and is near a landslide risk area. There are several existing underground utilities in Navellier St. In addition, Navellier St provides access to a number of neighborhoods to the east of the street. | This alignment is a combination of routes chosen from Alternative 1 and Alternative 3A. It is 600 LF longer than the preferred alignment, and a long length of the alignment is near a landslide risk area. The work in front of Windrush School will need to be done during school summer break. |

NOTES
1 Estimated based on number of taps within 60 feet of the alignment.
2 Per City of El Cerrito, Portola Middle School (bounded by Moeser Lane to the south, Portola Drive to the north, Navellier Street to the east and Everett Street to the west) will be relocated to Castro Elementary School site (bounded by Donal Avenue to the south, Gladys Avenue to the north, Lawrence Street to the east, and Norvell Street to the west).
3 Ranked by through principal or minor arterials based on road classification and existing level of service shown on City of El Cerrito 2005 Average Daily Traffic Map.
4 Minimum wall-to-wall clearance between existing underground utilities determined based on the critical cross sections prepared (3 for each alignment alternative). Required trench width is 4 feet, 8-inches.
5 Roads that are less than 35 feet curb to curb need to be closed because required construction ROW for 36-inch main is 25 feet and a minimum 10 foot travel width is required to maintain alternate one-way traffic flow.
6 Source: Distribution System Engineering's email to Angelina Wai from Marisa Boyce dated 4/26/2011 and follow-up phone conversation (based on open-cut method installation for 36-inch pipeline once contractor is mobilized).
7 Includes 6 months for mobilization and demobilization. Assumes normal 8 hours workday, typical construction hours between 7:00am to 7:00pm (per ESP 494 – Mitigation Guidelines for Major Capital Projects).
8 Project cost estimated in April 2011 dollars and included 15 percent design, 15 percent construction management, and 20 percent contingency.

**TABLE 4-4**
**CENTRAL PRESSURE ZONE PIPELINE (EL CERRITO / RICHMOND)**
**ALIGNMENT ALTERNATIVES COMPARISON MATRIX**

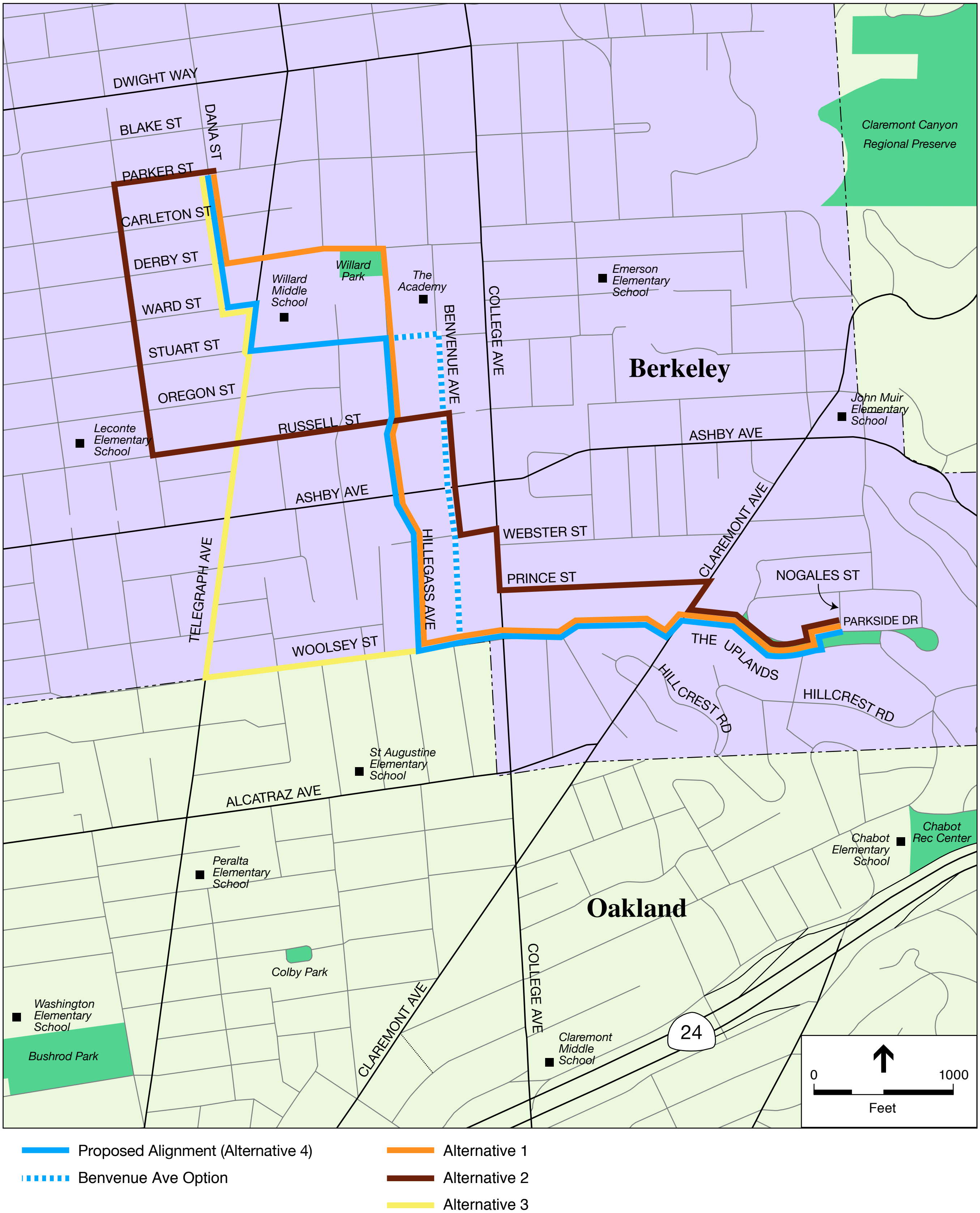
| | ALTERNATIVE 1 (Proposed Alignment) | ALTERNATIVE 2 | ALTERNATIVE 3 | ALTERNATIVE 4 |
|---|---|---|---|---|
| **ALIGNMENT DESCRIPTION** | | | | |
| City Location | El Cerrito / Richmond | El Cerrito / Richmond | El Cerrito / Richmond | El Cerrito / Richmond |
| Pipeline Length | 13,000 lineal feet | 14,600 lineal feet | 15,600 lineal feet | 14,600 lineal feet |
| Number of Customers Along Alignment[1] | 258 | 296 | 377 | 290 |
| Schools Affected | St John School | Manzanita Middle School | Fairmount School<br>Windrush School | None |
| **SCREENING CRITERIA** | | | | |
| Materials Engineering Recommendation | Acceptable | Acceptable | Acceptable | Acceptable |
| Liquefaction Potential | Low | Low | Low | Low |
| Cross Active Fault | No | No | No | No |
| Near Landslide Area (per EBMUD Study) | No | Yes (approximately 900 LF)<br>S 56th St – segments between Highland St and Bayview Street, and between Mariposa Street and Santa Clara Street | Yes (approximately 2,020 LF)<br>Key Blvd – between Conlon Ave and Knott Ave<br>Kearney St – between Eureka Ave and Lincoln Ave | No |
| Near Landslide Risk Area (per City of El Cerrito Study) | No | No | Yes<br>Key Blvd – between Nevin St and Conlon Ave | No |
| In Very High Fire Hazard Zones (per City of El Cerrito Study) | No | No | No | No |
| Traffic[2] | Very High<br>Alignment is through San Pablo Ave (principal arterial) | High<br>Majority of the alignment is through Carlson Blvd and San Pablo Ave (principal arterials) | Medium<br>Half of the alignment is through Moeser Ln., Richmond St, Hill St, Key Blvd (minor arterials) | High<br>Majority of the alignment is through San Pablo Ave (principal arterial). |
| Utility | Alignment parallels to a PG&E 8-inch gas line in San Pablo Avenue | Alignment parallels to a PG&E 24-inch high pressure gas line in Carlson Blvd between Central Ave and Burlingame Ave | Alignment parallels to PG&E 115 kV electric transmission lines in Liberty St between Schmidt and Gladys and in Hill St between Lexington Ave and Liberty St | Alignment parallels to a PG&E 8-inch gas line in San Pablo Ave and to a PG&E 115 kV electric transmission line in Liberty St between Schmidt and Gladys |
| Typically Required Right-of-Way / Construction Corridor | 25 feet<br>Public ROW | 25 feet<br>Public ROW | 25 feet<br>Public ROW | 25 feet<br>Public ROW |
| Available Curb to Curb Width | 80 feet to 85 feet<br>( 80 feet typical) | 30 feet to 70 feet<br>(30 feet typical) | 25 feet to 36 feet<br>(30 feet typical) | 30 feet to 85 feet<br>(80 feet typical) |
| Available Clearance for Trenching[3] | 14 feet<br>west side of San Pablo Street between Hill Street and Cutting Blvd | 11 feet<br>south side of Potrero Ave | 8 feet<br>west side of Key Blvd between Cutting Blvd and Knott | 8 feet<br>west side of Liberty St between Manila and Donal |
| Recommended Road Closures[4] | None | Tehama Avenue, Mariposa Street<br>S 56th Street, and Bayview Street | The entire alignment, except Moeser Lane | Schmidt Lane, Liberty Street, Gladys Avenue, Lexington Avenue, and Blake Avenue |
| Production Rate[5] | 80 – 200 LF / day | 80 – 200 LF / day | 80 – 200 LF / day | 80 – 200 LF / day |
| Construction Duration[6] | 9 – 14 months | 10 - 15 months | 10 – 15 months | 10 – 14 months |
| Estimated Project Cost[7] | $ 9.1 million or $ 10.5 million[8] | $ 12.4 million | $ 13.6 million | $ 10.3 million or $ 11.5 million 3 |
| OVERALL RANKING | 1 | 3 | 4 | 2 |
| SUMMARY COMMENTS | This alignment is the preferred alignment, because it is the shortest and most straight forward alignment. San Pablo Avenue is a wide roadway; road closure for construction should not be required. | This alignment is 1,600 LF longer than the preferred alignment, and it parallels to a PG&E 24-inch high-pressure gas line for 3,150 LF. Approximately 900 LF of the alignment is near landslide risk area. | This is the longest alignment and has high landslide risk (over 2,000 LF of the alignment is near landslide risk area). Existing underground utilities in the affected section of Key Boulevard are very congested. | This alignment is 1,100 LF longer than the preferred alignment. It is a combination of routes from Alternative 1 and Alternative 3 to avoid passing through the El Cerrito City Hall, Fire / Police Department, and St John School area. |

NOTES
1 Estimated based on number of taps along the alignment.
2 Project cost estimated in April 2011 dollars and included 15 percent design, 15 percent construction management, and 20 percent contingency.
3 San Pablo Ave is State highway subject to Caltrans' jurisdiction. The higher project costs reflect typical work hour restriction between 9:00am to 3:30pm or night time construction.
4 Ranked by through principal or minor arterial based on road classification and existing LOS from City of El Cerrito 2005 Average Daily Traffic Map.
5 Minimum wall-to-wall clearance between existing underground utilities determined base on the critical cross sections prepared (3 for each alignment alternative). Required trench width is 4 feet, 8-inches.
6 Roads that are less than 35 feet curb to curb need to be closed because required construction ROW for 36-inch main is 25 feet and a minimum 10 foot travel width is required to maintain alternate one-way traffic flow.
7 Source: Distribution System Engineering's email to Angelina Wai from Marisa Boyce dated 4/26/2011 and follow-up phone conversation (based on open-cut method installation for 36-inch pipeline once contractor is mobilized).
8 Includes 6 months for mobilization and demobilization. Except for Alternative 1, assumes normal 8 hours workday, typical construction hours between 7:00am to 7:00pm (per ESP 494 – Mitigation Guidelines for Major Capital Projects).

**TABLE 4-5**
**CENTRAL PRESSURE ZONE PIPELINE (RICHMOND / SAN PABLO)**
**ALIGNMENT ALTERNATIVES COMPARISON MATRIX**

| | ALTERNATIVE 1 | ALTERNATIVE 2 | ALTERNATIVE 3 | ALTERNATIVE 4 (Proposed Alignment) |
|---|---|---|---|---|
| **ALIGNMENT DESCRIPTION** | | | | |
| City Location | Richmond / San Pablo | Richmond / San Pablo | Richmond / San Pablo | Richmond / San Pablo |
| Pipeline Length | 9,700 lineal feet | 10,500 lineal feet | 12,200 lineal feet | 10,200 lineal feet |
| Number of Service Taps Along Alignment[1] | 178 | 253 | 298 | 187 |
| Schools Affected | Richmond High School | Dover Elementary School | Richmond High School | Richmond High School |
| **SCREENING CRITERIA** | | | | |
| Materials Engineering Recommendation | Acceptable | Acceptable | Acceptable | Acceptable |
| Liquefaction Potential | Low | Low | Low | Low |
| Cross Active Fault | No | No | No | No |
| Near Landslide Area | No | No | No | No |
| Traffic 3 | High<br>Alignment is through 23rd Street, which is a principal arterial. Peak hour traffic is about 2,000 vehicles/hour. | Low<br>Majority of alignment is along residential streets. 22nd Street becomes a principal arterial for two block from Roosevelt Ave. to Nevin Ave. | Low<br>Majority of alignment is along residential streets, except for portions on 23rd Street. | High<br>Alignment is through 23rd Street, which is a principal arterial. |
| Utility | Alignment parallels to PG&E 12-inch and 24-inch gas lines in 23rd Street between Brookside and Road 20 / San Pablo. | Alignment parallels to ConocoPhillips high pressure fuel line 1) in Alfreda Blvd between 20th St and 21st St and 2) in 21st St between Alfreda Blvd and Dover Ave. It also parallels to PG&E 24-inch high pressure gas line in an EBMUD RW X-399 (i.e. driveway of church located at 2060 Brookside Dr.) | Alignment parallels to PG&E 12-inch and 24-inch gas lines in 23rd Street between Brookside and Road 20 / San Pablo. | Alignment parallels to PG&E 12-inch and 24-inch gas lines Brookside Drive |
| Typically Required Right-of-Way/ Construction Corridor | 25 feet<br>Public ROW | 25 feet<br>Public ROW | 25 feet<br>Public ROW | 25 feet<br>Public ROW |
| Available Curb to Curb Width | 50 feet to 56 feet<br>(56 feet typical) | 20 feet to 40 feet<br>(30 feet typical) | 24 feet to 56 feet<br>(30 feet typical) | 20 feet to 56 feet<br>(56 feet typical) |
| Available Clearance for Trenching[3] | 7 feet, 6-inches | 6 feet, 8-inches | 6 feet, 9-inches | 7 feet, 6-inches |
| Recommended Road Closures[4] | None | The entire alignment except 22nd St. between Roosevelt Ave. and Nevin Ave. | The entire alignment except 23rd Street. | Brookside Drive |
| Special Construction Methods Required 6 | Jack and Bore – Wildcat Creek Crossing<br>Pipe Bridge – San Pablo Creek Crossing | Jack and Bore – Wildcat Creek Crossing<br>Pipe Bridge – San Pablo Creek Crossing | Jack and Bore – Wildcat Creek Crossing<br>Pipe Bridge – San Pablo Creek Crossing | Jack and Bore – Wildcat Creek Crossing<br>Pipe Bridge – San Pablo Creek Crossing |
| Production Rate[6] | 80 – 200 LF / day (Open-cut)<br>2 LF / day (Jack and Bore) | 80 – 200 LF / day (Open-cut)<br>2 LF / day (Jack and Bore) | 80 – 200 LF / day (Open-cut)<br>2 LF / day (Jack and Bore) | 80 – 200 LF / day (Open-cut)<br>2 LF / day (Jack and Bore) |
| Construction Duration[7] | 12 to 16 months | 12 to 16 months | 13 to 17 months | 12 to 16 months |
| Estimated Project Cost[8] | $ 8.9 million or $ 10.0 million | $ 9.4 million | $ 12.9 million | $ 9.3 million or $ 10.3 million |
| Overall Ranking | 2 | 3 | 4 | 1 |
| Summary Comments | This is the shortest alignment. It minimizes the impacts to residential areas and minimizes the length of parallel alignments next to large diameter hazardous pipelines. | Parallels Conoco Philips Gas line for 2,600 LF, and 24-inch PG&E gas line for 250 LF. This alignment has the narrowest streets and most congested utilities of the three alignments. It crosses San Pablo Creek at a less visually sensitive location, but requires more trees to be removed. | This is the longest alignment which increases construction impacts without providing any significant benefits | It crosses San Pablo Creek at a less visually sensitive location, but requires more trees to be removed. It parallels a 24-inch PG&E gas line for 500 LF. |

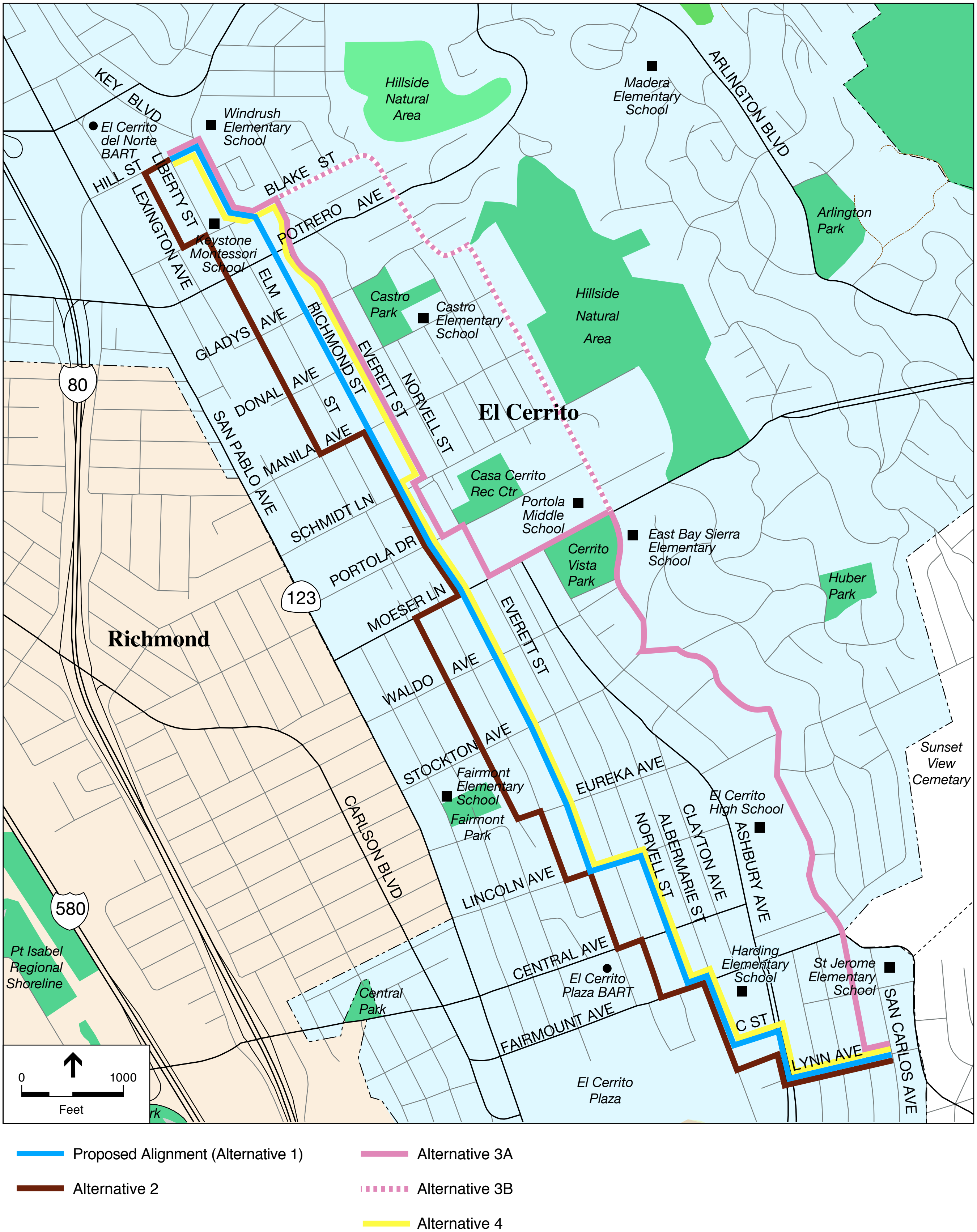
NOTES
1 Estimated based on number of taps within 75 feet of the alignment.
2 Project cost estimated in April 2011 dollars and included 15 percent design, 15 percent construction management, and 20 percent contingency. Including creek crossings cost (i.e. jack and bore for Wildcat Creek and pipe bridge for San Pablo Creek).
3 Ranked by through principal or minor arterial based on road classification and existing LOS from City of Richmond Daily Traffic Map.
4 Minimum wall-to-wall clearance between existing underground utilities determined base on the critical cross sections prepared (3 for each alignment alternative). Required trench width is 4 feet, 8-inches.
5 Roads that are less than 35 feet curb to curb need to be closed because required construction ROW for 36-inch main is 25 feet and a minimum 10 foot travel width is required to maintain alternate one-way traffic flow.
6 Require for creek crossings.
7 Source: a) Distribution System Engineering's email to Angelina Wai from Marisa Boyce dated 4/26/2011 and follow-up phone conversation (based on open-cut method installation for 36-inch pipeline once contractor is mobilized).
b) Hesperian Boulevard Pipeline Relocation Project (Spec No. 2020) – installation of 110 lineal feet of 30" ML&CS pipe by jack and bore method.
8 Includes 6 months for mobilization and demobilization. Assumes normal 8 hours workday, typical construction hours between 7:00am to 7:00pm (per ESP 494 – Mitigation Guidelines for Major Capital Projects).




SOURCE: ESA, EBMUD

EBMUD West of Hills Northern Pipelines . 211488

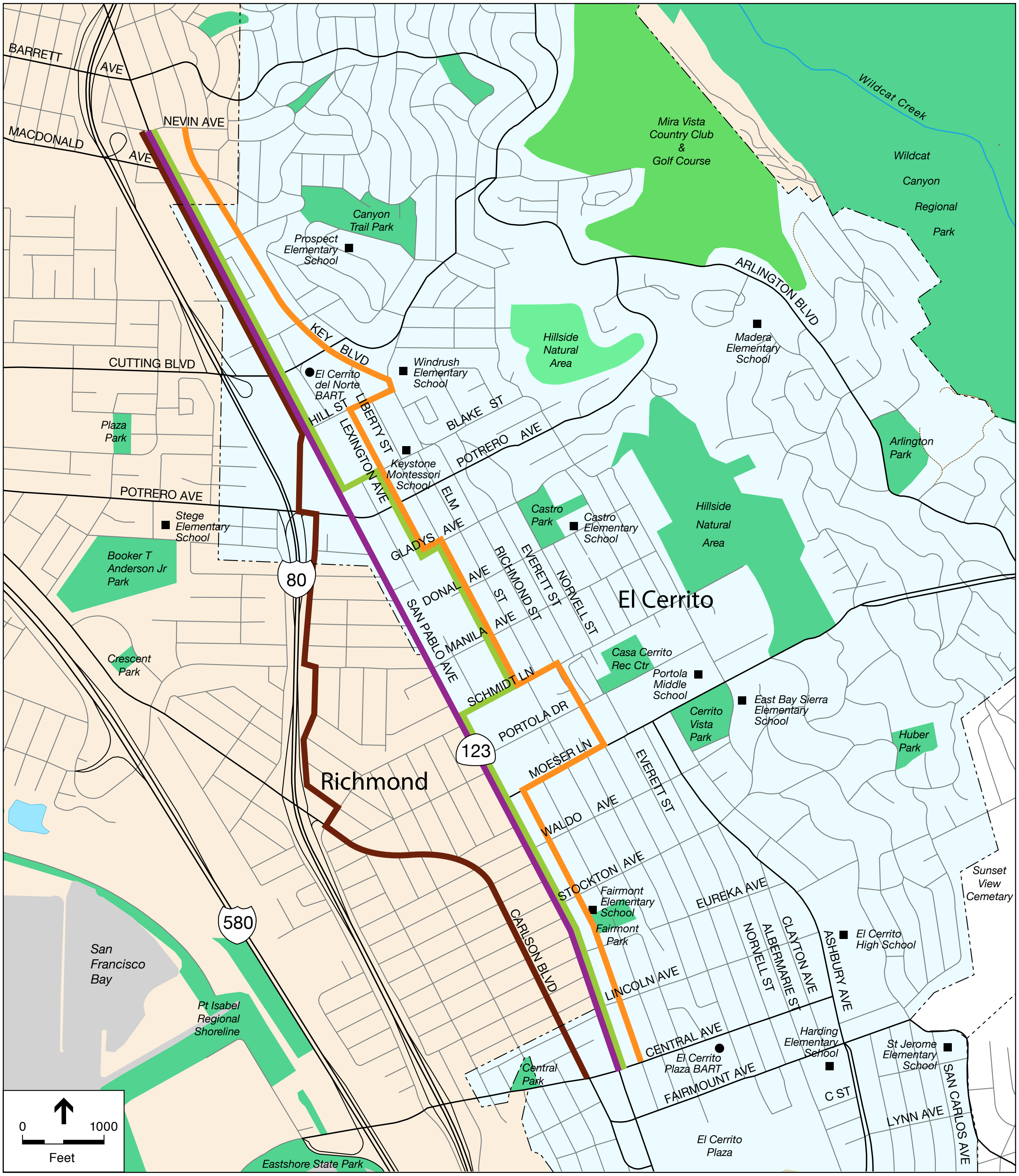
**Figure 4-1**
Wildcat Pipeline (Berkeley)
EBMUD Alignment Alternatives




SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure 4-2**
Wildcat Pipeline (El Cerrito)
EBMUD Alignment Alternatives

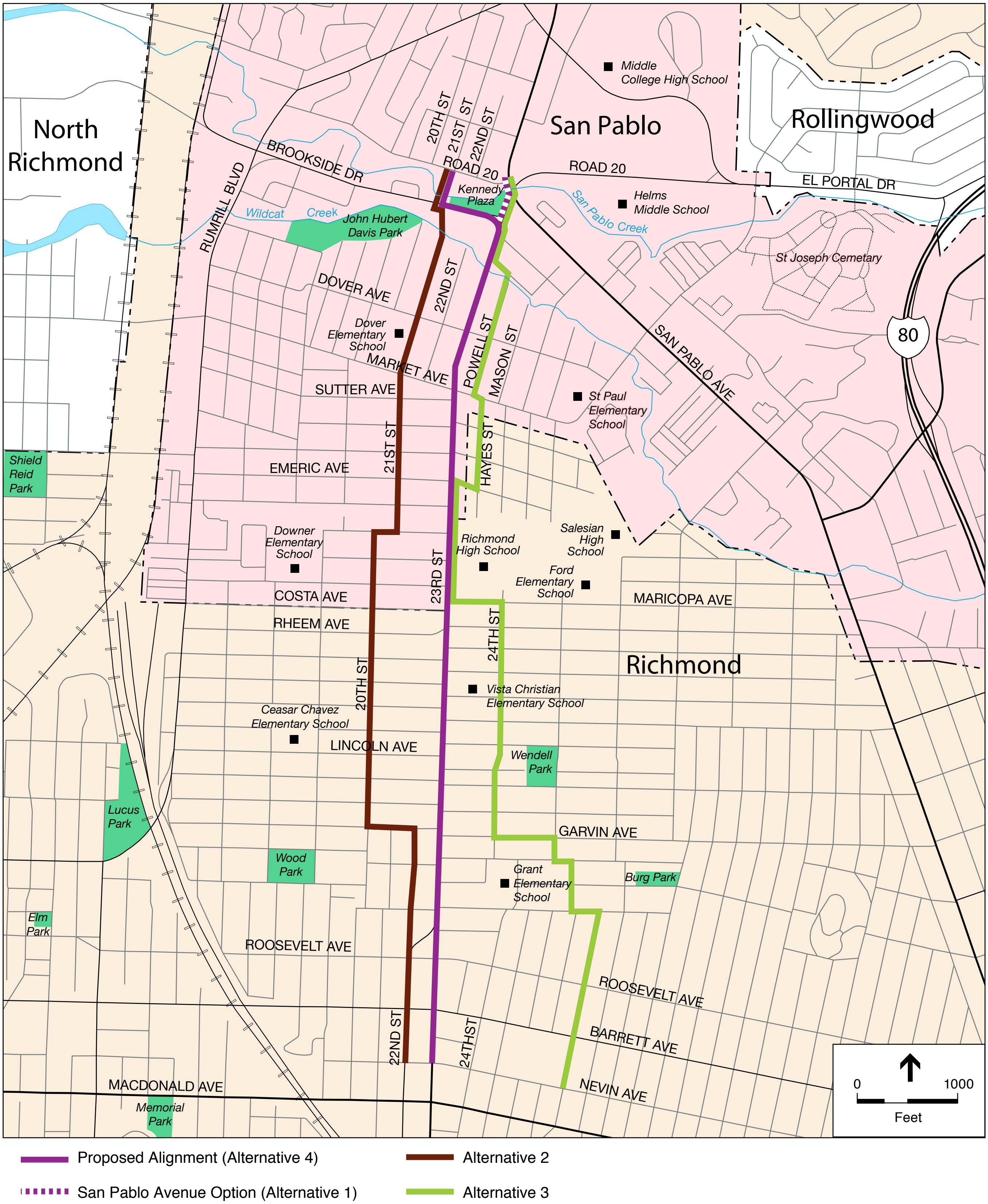



Proposed Alignment (Alternative 1)
Alternative 2
Alternative 3
Alternative 4

SOURCE: ESA, EBMUD

EBMUD West of Hills Northern Pipelines . 211488

**Figure 4-3**
Central Pressure Zone Pipeline (El Cerrito/Richmond)
EBMUD Alignment Alternatives




SOURCE: ESA, EBMUD

EBMUD West of Hills Northern Pipelines . 211488

**Figure 4-4**
Central Pressure Zone Pipeline (Richmond/San Pablo)
EBMUD Alignment Alternatives

**Central Pressure Zone Pipeline (Richmond/San Pablo) San Pablo Avenue Option**

EBMUD included evaluation of the San Pablo Avenue Option to the Central Pressure Zone Pipeline (Richmond/San Pablo) at an equal level of detail in this EIR to preserve flexibility in the implementation of this pipeline segment. The San Pablo Avenue Option consists of a pipe bridge spanning the creek adjacent to San Pablo Avenue within the park at Kennedy Plaza, which is owned and maintained by the City of San Pablo, and would connect to an existing pipeline near the intersection of Road 20 and San Pablo Avenue. The San Pablo Avenue Option follows the same alignment as Alternative 1 in Table 4-5.

# 4.3 Alternatives Identified to Avoid or Reduce Significant Impacts

## 4.3.1 EBMUD Alternative Alignments

The EBMUD alignments presented in Tables 4-3 through 4-5 were reviewed to determine if any of these alternative alignments could avoid or reduce the potentially significant impacts identified in Chapter 3 and summarized in the Summary chapter. Most potentially significant impacts that were identified would be reduced to less than significant with implementation of mitigation measures. However, several significant and unavoidable impacts related to aesthetics, noise, and traffic were identified. Therefore, alternatives were reviewed for their potential to reduce the significant and unavoidable impacts related to these four resource areas. For a project of this nature, the selection of alternatives often involves trade-offs which may lessen some impacts, and worsen others. These trade-offs are discussed further in Section 4.6 below.

Based on the potential to reduce potentially significant impacts, the following alternative alignments were chosen for further review in Section 4.6 below:

- *Wildcat Pipeline (Berkeley)* – Alternative 3, shown in yellow in Figure 4-1, was selected for potential to reduce construction related traffic, noise, vibration and air quality related impacts in residential areas by utilizing Telegraph Avenue (a predominately commercial corridor) to a greater extent.

- *Wildcat Pipeline (El Cerrito)* – Alternative 2, shown in brown in Figure 4-2, was selected for potential to reduce construction related traffic impacts along Richmond Street (a travel corridor).

- *Central Pressure Zone Pipeline (El Cerrito/Richmond)* – Alternative 3, shown in orange in Figure 4-3, was selected for potential to reduce construction related traffic impacts along San Pablo Avenue.

- *Central Pressure Zone Pipeline (Richmond/San Pablo)* – Alternative 2, shown in brown in Figure 4-4, was selected for potential to reduce construction related traffic impacts along 23rd Street and to avoid aesthetic impacts related to construction of the pipe bridge at San Pablo Avenue.

# 4.4 Other Alternatives Considered but Rejected

## 4.4.1 Alternative Construction Techniques Considered but Rejected

### Microtunneling

Use of microtunneling instead of a pipe bridge has the potential to reduce impacts to biological and aesthetic resources at the San Pablo Creek crossing. Microtunneling is a process that uses a remotely controlled, guided microtunnel boring machine to install a pipeline underground without the need for trenching. Microtunneling could be used to install the pipeline beneath San Pablo Creek, avoiding the significant aesthetic impacts associated with the installation of the pipe bridge adjacent to San Pablo Avenue. Use of microtunneling could also reduce some of the impacts to biological resources that might occur due to construction of the pipe bridge and bridge footings adjacent to San Pablo Creek.

While microtunneling has the potential to reduce impacts to biological and aesthetic resources at the San Pablo Creek crossing, there is a potential for water quality degradation from drilling under San Pablo Creek due to "frac-outs." Microtunneling typically uses a gel mud to reduce friction and stabilize the bore-hole. The gel mud is typically composed of a mixture of water and bentonite (clay-based drilling lubricant) or alternative drilling lubricant. A frac-out occurs when the drilling mud is forced vertically to the ground surface. This drilling mud has the potential to enter the creek and impact water quality. Additionally, this alternative would require the construction of a jacking and receiving pits on either side of San Pablo Creek, which could result in additional environmental impacts, including traffic impacts (the pits would be developed within or adjacent to streets) and noise impacts (due to prolonged construction at the jacking pit). Because of these additional impacts, microtunneling has been eliminated from further evaluation.

### Jack and Bore Tunneling

Use of jack and bore tunneling instead of open trench construction has the potential to reduce disturbance of surface features, including creeks and roadways. This method of construction is proposed at Wildcat Creek and is described in Section 2.7.2. The jack and bore method could be used to tunnel under intersections, thereby avoiding the closure of travel lanes or streets that cross the proposed pipeline alignments. As an example, the jack and bore method could be used at the Wildcat Pipeline (Berkeley) crossing of Ashby Avenue. The required jacking and receiving pits could be located in Hillegass Avenue (or alternatively Benvenue Avenue) with the tunnel constructed under Ashby Avenue, thereby avoiding lane closures on Ashby Avenue. Accommodating the pits (13 to16 feet wide and 13 to 36 feet long) and work area would require the closure of Hillegass/Benenvue Avenue. Because jack and bore tunneling is much slower than open trench tunneling, construction of the pipeline through the intersection would increase from about 5 days to up to 10 weeks. While through traffic on Ashby Avenue would not be disrupted, the intersection as a whole would be affected for a much longer period. In addition, excavation of the pits would require pile driving, and the resulting noise and vibration would impact the surrounding community. Because of these additional impacts, jack and bore tunneling has been eliminated from further evaluation to reduce traffic impacts at street intersections.

## 4.4.2 System Alternatives Considered but Rejected

### Utilize the San Pablo Water Treatment Plant

The San Pablo Water Treatment Plant (WTP) is a standby facility that is not maintained. EBMUD determined that the San Pablo WTP will be used only during planned outages of the Orinda WTP, Claremont Tunnel, and the Wildcat Aqueducts and a major renovation would be needed at the San Pablo WTP prior to any planned outage. EBMUD maximizes treated water use at the Orinda WTP because it receives water directly from Pardee Reservoir which requires less treatment than the water supply that originates within the watershed areas of the local terminal reservoirs (e.g. San Pablo Reservoir). Although San Pablo WTP is a conventional WTP, it lacks many modern processes, including ozone needed to control periodic taste and odor episodes. Because extensive improvements to San Pablo WTP would be required and it would be prohibitively expensive to implement and operate, utilizing San Pablo WTP was been eliminated from further evaluation.

### Increase Utilization of the Sobrante Water Treatment Plant

The Sobrante WTP provides water to the northern portion of the West of Hills area. It treats water from San Pablo Reservoir, a local terminal reservoir. While Sobrante WTP will need to be expanded to meet future projected demands, significant additional infrastructure would be required to improve flow to the northern portion of the West of Hills area (approximately 20,500 feet of new treated water pipeline and a pump); construction of this additional infrastructure would result in significant traffic disruptions and other environmental impacts. In addition, one of the project needs for the proposed Project is to allow EBMUD to take the Sobrante WTP off-line during the winter. For these reasons, this alternative has been eliminated from further evaluation.

### Additional Water Storage

EBMUD's distribution system consists of a network of water treatment plants, pipelines and reservoirs. Reservoirs provide short-term storage to provide for peak water use periods. EBMUD currently has adequate storage capacity in the West of Hills service area. EBMUD does not attempt to reduce transmission capacity through the use of storage, because maximum day demands can occur back to back. Without sufficient water transmission capacity to refill the water storage reservoirs between maximum day demand events, solutions that rely upon storage can run out of water. Increasing the storage capacity of the existing reservoirs in the West of Hills service area will not eliminate the need for additional transmission capacity, because water demand is ultimately met through treatment and distribution of water. As a result, providing additional water storage in the West of Hills service area would not eliminate the need for additional transmission capacity, and this alternative has been eliminated from further evaluation.

### Water Conservation

As described in Chapter 2, proposed Project improvements have been sized to meet projected future increases in water demand, in addition to addressing existing transmission and storage deficiencies and improving reliability. The water demand projections are based on EBMUD's 2040 Demand Study (EBMUD et al., 2009), an element of EBMUD's Water Supply Management Program 2040. The 2040 Demand Study identifies that planned conservation programs and water recycling projects will offset a portion of future distribution system demand. However, the location of future water conservation within the overall service area is uncertain and its effect on maximum day demand is also uncertain. While customers may on average reduce their water use over the course of a year, they may not reduce their water use during heat waves which often cause maximum day demand events to occur. EBMUD projects that, despite increased levels of water conservation and recycling, maximum day water demand in its service area will increase; consequently, the existing operational deficiencies noted in Section 2.2, Project Need will worsen. As a result, increased levels of water conservation would not eliminate the need for the proposed Project.

# 4.5 Comparison of Selected Alternatives and Identification of the Environmentally Preferred Project

This section presents a comparison of the selected alternatives and identifies the environmentally superior alternative. This section presumes implementation of mitigation measures identified in the EIR. **Tables 4-6** through **4-9** provide a summary comparison of impacts for the proposed Project and alternatives by impact classification (e.g. significant, mitigable, less than significant).

## 4.5.1 No Project Alternative – All Pipelines

Under the No Project Alternative, none of the environmental impacts associated with the proposed Project would occur. However, the need for the proposed Project would not be met and none of the water service needs associated with the Project would be satisfied. As discussed in Chapter 2, Project Description, the proposed Project is needed to correct existing deficiencies in water transmission and storage operations, meet projected future water demands, improve system reliability and water quality challenges, and facilitate repair and replacement of aging infrastructure. If the proposed Project were not implemented, EBMUD's ability to ensure reliable water service to West of Hills customers over the long term would be further constrained. Therefore, existing deficiencies would continue and as water demand increases in the future, EBMUD's ability to meet the demand would diminish.

Consistent with the CEQA Guidelines, Section 15126.6(a), the comparison of alternatives and determination of the environmentally superior alternative is based on the ability of the alternative to meet the basic objectives of the proposed Project while avoiding or substantially lessening any significant impacts. As discussed above, under the No Project Alternative no pipeline segments would be constructed. As a result, the No Project Alternative is considered to be environmentally superior to the "action" alternatives because none of the adverse impacts associated with those alternatives would occur. While it would be the environmentally superior alternative, the No Project Alternative would not meet any of the projects objectives including the objective of remedying existing deficiencies. According to CEQA Guidelines Section 15126.6(e)(2), when the no project alternative is identified as the environmentally superior alternative, the EIR must identify an environmentally superior alternative among the “build” alternatives. The environmentally superior alternative is identified for each pipeline below.

## 4.5.2 Wildcat Pipeline (Berkeley) – Alternative Alignment 3

Tables 4-2 and 4-6 compare characteristics and magnitude of impacts associated with the proposed alignment of the Wildcat Pipeline (Berkeley) against Alternative 3 and the No Project Alternative. Alternative 3 is about 700 feet longer than the proposed alignment and would shift a larger proportion of construction-related impacts to Telegraph Avenue and away from the residential areas along Hillegass Avenue/Benvenue Avenue and Stuart Street. Because Alternative 3 includes a longer section of Telegraph Avenue (which has a higher daily traffic volume than the proposed alignment) a larger volume of traffic would need to be detoured during construction, exposing a greater overall number of people to adverse traffic impacts. Because the eastern portion of Alternative 3 is similar to the proposed alignment it would not reduce impacts to operating conditions at the intersection of Claremont Avenue/Hillcrest Avenue/Brookside Drive identified for the proposed alignment.

The proposed alignment would expose fewer people to construction-related impacts and would result in lower construction-related air emissions than Alternative 3. As a result, the proposed alignment is considered to be environmentally superior to Alternative 3.

### Optional Routes

During initial review of the proposed Project, there was not a clear advantage between routing the Wildcat Pipeline (Berkeley) pipeline along Hillegass Avenue and routing it along Benvenue Avenue between Woolsey Street and Stuart Street (Figure 2-6). As a result, to provide EBMUD flexibility in choosing the final pipeline alignment, this EIR also analyzes the option of routing the pipeline along Benvenue Avenue instead of Hillegass Avenue. These routes are similar in character, being lightly traveled residential streets. However, while lightly traveled, Hillegass Avenue carries approximately 1,550 vehicles per day, compared to 860 vehicles per day for Benvenue Avenue (Table 3.13-1). As a result construction on Hillegass Avenue would require the detouring of approximately 690 more vehicles per day. In addition, traffic calming measures in the area would make it more difficult for residents on Hillegass Avenue to access their homes if Hillegass Avenue were closed for construction – Woolsey Street is barricaded at Hillegass Avenue, and Webster Street does not connect to Bateman Street or Regent Street. If construction occurs on Benvenue Avenue, Hillegass Avenue (as well as College Avenue) would be available detour routes. Therefore, all other environmental impacts being roughly equal, Benvenue Avenue is considered to be the environmentally superior option.

**TABLE 4-6**
**WILDCAT PIPELINE (BERKELEY)**
**EVALUATION OF ALTERNATIVE 3 AND COMPARISON TO THE PROPOSED PROJECT**

| | Proposed Alignment | Alternative 3 | No Project Alternative | Discussion of the Proposed Project and Alternative 3 |
|---|---|---|---|---|
| **Potential Impacts** | | | | |
| Aesthetics | LSM | LSM = | -- | Like the proposed alignment, Alternative 3 could result in short-term visual impacts due to construction activities and long-term changes in visual character due to tree removal. |
| Air Quality | LSM | LSM + | -- | Like the proposed alignment, Alternative 3 would generate short term increases in criteria pollutant emissions during construction. Because Alternative 3 is 700 feet longer, approximately 9% more emissions would be generated. |
| Biological Resources | LSM | LSM = | -- | Like the proposed alignment, Alternative 3 would require removal of ornamental trees in the park strip along The Uplands, which could have an adverse affect on urban habitat quality and would conflict with City of Berkeley policies protecting trees. |
| Cultural Resources | LSM | LSM = | -- | Like the proposed alignment, construction of Alternative 3 could result in vibration levels that have the potential to damage any historic structures located along the alignment. Excavation activities also have the potential to disturb archaeological and paleontological resources or human remains. |
| Energy | -- | -- | -- + | Like the proposed alignment, Alternative 3 would improve the efficiency of pumping plants serving the West of Hills area, and extend the useful life of existing EBMUD facilities. |
| Geology and Soils | LSM | LSM = | -- | Issues related to surface fault rupture, liquefaction, groundshaking, landslides, erosion, unstable geologic units and expansive would be similar under the proposed alignment and Alternative 3. |
| Greenhouse Gas Emissions | -- | -- = | -- | Because Alternative 3 is 700 feet longer, approximately 9% more emissions would be generated. However, like the proposed alignment, construction- and operations-related GHG emissions under Alternative 3 are expected to result in less-than-significant impacts on climate change. |
| Hazards and Hazardous Materials | LSM | LSM = | -- | Like the proposed alignment, construction of Alternative 3 could expose workers to hazardous materials and/or damage existing utilities. |
| Hydrology and Water Quality | LSM | LSM = | -- | Like the proposed alignment, construction and dewatering activities under Alternative 3 have the potential to degrade water quality. The alignments of the proposed alignment and Alternative 3 cross the flood zone of Harwood Creek in Berkeley, but would not impede or redirect flood flows. |
| Noise | SU | SU | -- | Construction activities under Alternative 3 and the proposed Project would be similar and would exceed the City of Berkeley's noise ordinance. |
| Recreation | LSM | LSM = | -- | Like the proposed alignment, Alternative 3 would affect the park strip along The Uplands due to the removal of ornamental trees. |

**TABLE 4-6 (Continued)**
**WILDCAT PIPELINE (BERKELEY)**
**EVALUATION OF ALTERNATIVE 3 AND COMPARISON TO THE PROPOSED PROJECT**

| | Proposed Alignment | Alternative 3 | No Project Alternative | Discussion of the Proposed Project and Alternative 3 |
|---|---|---|---|---|
| **Potential Impacts (continued)** | | | | |
| Transportation and Traffic | LSM | LSM + | -- | The eastern segment of Alternative 3 follows the same streets as the proposed alignment; therefore, impacts to operating conditions at the intersection of Claremont Avenue/Hillcrest Boulevard and Brookside Drive would be the same. However, the western segment of Alternative 3 follows Telegraph Avenue instead of Hillegass Avenue/Benvenue Avenues and therefore traffic impacts associated with detours and lane closures would be higher because Telegraph Avenue has a higher traffic volume, and is a transit route. |

Legend:
LSM = Less than Significant with Mitigation
SU = Significant/Unavoidable with Mitigation
-- = Less than Significant or No Impact
+ = Impact would be greater under this alternative than under the proposed Project
– = Impact would be less under this alternative than under the proposed Project
= Impact would be same (or similar) under this alternative as under the proposed Project

## 4.5.3 Wildcat Pipeline (El Cerrito) – Alternative Alignment 2

Tables 4-3 and 4-7 compare characteristics and magnitude of impacts associated with the proposed alignment of the Wildcat Pipeline (El Cerrito) against Alternative 2 and the No Project Alternative. As shown in Figure 4-2, the majority of Alternative 2 runs along several residential streets including Liberty Street and Lexington Avenue, instead of Richmond Street.

Alternative 2 would shift a portion of construction-related impacts from Richmond Street (a minor arterial) to adjacent residential streets. Since these residential streets carry a lower volume of traffic than Richmond Street, traffic impacts would be reduced under Alternative 2 compared to the proposed alignment. In particular, Alternative 2 would likely reduce impacts to operating conditions at intersections along San Pablo Avenue which occurs as the result of detour routing on San Pablo Avenue. Under Alternative 2, less traffic would be diverted (because of lower traffic volumes on affected roadways), and diverted traffic could be detoured along unaffected portions of Richmond Street, which as a minor arterial can carry more traffic. However, some significant and unavoidable traffic impacts may still occur; for instance, the operation of the Richmond Street/Fairmount Ave intersection (adjacent to the El Cerrito Plaza BART station) may also experience significant delays due to detour traffic.

Alternative 2 is approximately 1,500 feet longer than the preferred alignment, and approximately 31 more customers are located along this alignment (461 compared to 430 for the proposed alignment); as a result, more customers would be directly affected by construction on their street. In addition, because of the additional length of the Alternative 2 alignment, approximately 11 percent more air quality emissions would be generated. In addition Alternative 2 parallels an

**TABLE 4-7**
**WILDCAT PIPELINE (EL CERRITO)**
**EVALUATION OF ALTERNATIVE 2 AND COMPARISON TO THE PROPOSED PROJECT**

| | Proposed Alignment | Alternative 2 | No Project Alternative | Discussion of the Proposed Project and Alternative 2 |
|---|---|---|---|---|
| **Potential Impacts** | | | | |
| Aesthetics | LSM | LSM = | -- | Like the proposed alignment, Alternative 2 could result in short-term visual impacts due to construction activities. |
| Air Quality | LSM | LSM + | -- | Like the proposed alignment, Alternative 2 would generate short term increases in criteria pollutant emissions during construction. Because Alternative 2 is 1,500 feet longer, approximately 11% more emissions would be generated. |
| Biological Resources | LSM | LSM = | -- | Like the proposed alignment, construction activities associated with Alternative 2 could adversely affect urban habitat quality. |
| Cultural Resources | LSM | LSM+ | -- | Construction activities under both the proposed Project and Alternative 2 have the potential to disturb archaeological sites, paleontological resources or human remains and/or could result in vibration levels that have the potential to damage any historic structures located along the alignment. Because Alternative 2 is 1,500 feet longer, there would be a higher potential to disturb sensitive resources. |
| Energy | -- | -- | -- + | Like the proposed alignment, Alternative 2 would improve the efficiency of pumping plants serving the West of Hills area, and extend the useful life of existing EBMUD facilities. |
| Geology and Soils | LSM | LSM = | -- | Issues related to surface fault rupture, liquefaction, groundshaking, landslides, erosion, unstable geologic units and expansive would be similar under the proposed alignment and Alternative 2. |
| Greenhouse Gas Emissions | -- | -- + | -- | Because Alternative 2 is 1,500 feet longer, approximately 11% more emissions would be generated. However, like the proposed alignment, construction- and operations-related GHG emissions under Alternative 2 are expected to result in less-than-significant impacts on climate change. |
| Hazards and Hazardous Materials | LSM | LSM + | -- | Alternative 2 parallels a 115 KV underground electric line in Liberty Street and a gas line Lexington Avenue which could pose a construction hazard. |
| Hydrology and Water Quality | LSM | LSM + | -- | Like the proposed alignment, construction and dewatering activities under Alternative 2 have the potential to degrade water quality. |
| Noise | SU | SU + | -- | Construction activities under Alternative 2 would be the similar to the proposed alignment. However, since slightly more residents are located along the Alternative 2 alignment compared to the proposed alignment, more sensitive receptors would be exposed to noise related impacts. |
| Recreation | LS | LS = | -- | Both the proposed alignment and Alternative 2 would pass in front of Harding Park and as a result, construction-related noise and dust could temporarily disrupt recreational activities. |

**TABLE 4-7 (Continued)**
**WILDCAT PIPELINE (EL CERRITO)**
**EVALUATION OF ALTERNATIVE 2 AND COMPARISON TO THE PROPOSED PROJECT**

| | Proposed Alignment | Alternative 2 | No Project Alternative | Discussion of the Proposed Project and Alternative 2 |
|---|---|---|---|---|
| **Potential Impacts (cont.)** | | | | |
| Transportation and Traffic | SU | SU = | -- | Alternative 2 would shift a portion of construction-related impacts from Richmond Street (a minor arterial) to adjacent residential streets, which would reduce traffic impacts. In particular, Alternative 2 would likely reduce impacts to operating conditions at intersections along San Pablo Avenue. However, some significant and unavoidable traffic impacts at the Richmond Street/Fairmount Ave intersection may still occur. However, under Alternative 2, Richmond Street would be used as a detour route and would likely result in significant impacts to traffic operations along this street. |

Legend:
LSM = Less than Significant with Mitigation
SU = Significant/Unavoidable with Mitigation
-- = Less than Significant or No Impact
+ = Impact would be greater under this alternative than under the proposed Project
– = Impact would be less under this alternative than under the proposed Project
=Impact would be same (or similar) under this alternative as under the proposed Project

underground high voltage line in Liberty Street which could pose a construction hazard. Alternative 2 would eliminate construction related impacts to Windrush School. All other impacts would be similar between the proposed alignment and Alternative 2.

Because the proposed alignment is 1,500 feet shorter than Alternative 2, construction-related impacts, including air pollutant emissions, would be lower. As a result, the proposed alignment is the environmentally superior alternative.

## 4.5.4 Central Pressure Zone Pipeline (El Cerrito/Richmond) – Alternative Alignment 3

Tables 4-4 and 4-8 compare the characteristics and magnitude of impacts associated with the proposed alignment of the Central Pressure Zone Pipeline (El Cerrito/Richmond) against Alternative 3 and the No Project Alternative. Under Alternative 3, the pipeline alignment would be located along several minor arterials and residential streets instead of San Pablo Avenue, a principal arterial (see Figure 4-3).

Alternative 3 would eliminate traffic impacts associated with construction work along San Pablo Avenue and would reduce negative impacts to operating conditions along San Pablo Avenue. Most construction would occur in residential streets that do not carry large traffic volumes, as a result less traffic would need to be detoured and that traffic could be routed along San Pablo Avenue and unaffected portions of Richmond Street. Significant and unavoidable traffic impacts would likely occur. In particular, the northern portion of the alignment is along Key Boulevard, which because its width would need to be closed during construction. Closing Key Boulevard

**TABLE 4-8**
**CENTRAL PRESSURE ZONE PIPELINE (EL CERRITO/RICHMOND)**
**EVALUATION OF ALTERNATIVE 3 AND COMPARISON TO THE PROPOSED PROJECT**

| | Proposed Alignment | Alternative 3 | No Project Alternative | Discussion of the Proposed Project and Alternative 3 |
|---|---|---|---|---|
| **Potential Impacts** | | | | |
| Aesthetics | LSM | LSM = | -- | Like the proposed alignment, Alternative 3 could result in short-term visual impacts due to construction activities. |
| Air Quality | LSM | LSM + | -- | Like the proposed alignment, Alternative 3 would generate short term increases in criteria pollutant emissions during construction. Because Alternative 3 is 2,600 feet longer, approximately 20% more emissions would be generated. Additionally, under Alternative 3, air quality impacts would be shifted to residential areas instead of the commercial areas along the proposed alignment and would affect a larger number of customers than the proposed Project. |
| Biological Resources | LSM | LSM = | -- | Like the proposed alignment, construction activities associated with Alternative 3 could adversely affect urban habitat quality. |
| Cultural Resources | LSM | LSM+ | -- | Construction activities under both the proposed Project and Alternative 3 have the potential to disturb archaeological sites, paleontological resources or human remains and/or could result in vibration levels that have the potential to damage any historic structures located along the alignment. In addition, Alternative 3 transects a known and extensive archaeological site. |
| Energy | -- | -- | -- + | Like the proposed alignment, Alternative 3 would improve the efficiency of pumping plants serving the West of Hills area, and extend the useful life of existing EBMUD facilities. |
| Geology and Soils | LSM | LSM+ | -- | Alternative 3 is located near a landslide risk area and as a result would be exposed to increased hazards from landslides. |
| Greenhouse Gas Emissions | -- | -- + | -- | Because Alternative 3is 2,600 feet longer, approximately 20% more emissions would be generated. However, like the proposed alignment, construction- and operations-related GHG emissions under Alternative 3 are expected to result in less-than-significant impacts on climate change. |
| Hazards and Hazardous Materials | LSM | LSM + | -- | Like the proposed alignment, construction of Alternative 3 could expose workers to hazardous materials and/or damage existing utilities, because Alternative 3 is 2,600 feet longer, additional hazards could be encountered. In addition, Alternative 3 would also use Key Boulevard where the existing underground utilities are very congested. |
| Hydrology and Water Quality | LSM | LSM + | -- | Like the proposed alignment, construction and dewatering activities under Alternative 3 have the potential to degrade water quality, because Alternative 3 is 2,600 feet longer, additional impacts could occur. |
| Noise | SU | SU + | -- | Construction activities under Alternative 3and the proposed Project would be the similar and would exceed the City of Richmond’s noise ordinance. However, since Alternative 3 runs through residential streets as opposed to San Pablo Avenue, |

**TABLE 4-8 (Continued)
CENTRAL PRESSURE ZONE PIPELINE (EL CERRITO/RICHMOND)
EVALUATION OF ALTERNATIVE 3 AND COMPARISON TO THE PROPOSED PROJECT**

| | Proposed Alignment | Alternative 3 | No Project Alternative | Discussion of the Proposed Project and Alternative 3 |
|---|---|---|---|---|
| **Potential Impacts (cont.)** | | | | |
| Noise (cont.) | | | | noise impacts would be shifted to residential areas. In addition, more residents are located along the Alternative 3 alignment compared to the proposed alignment; therefore, more sensitive receptors would be exposed to noise related impacts. |
| Recreation | -- | -- | -- | No significant recreational uses are located along the proposed and alternative alignments. |
| Transportation and Traffic | SU | SU - | -- | Alternative 3 would eliminate traffic impacts associated with construction along San Pablo Avenue. However, significant and unavoidable traffic impacts would likely occur along Key Boulevard, disrupting access to Del Norte BART station and potentially resulting in delays at key intersections on San Pablo Avenue. Alternative 3 would also require full road closure along a majority of the alignment, disrupting access to residential areas during construction hours. |

Legend:
LSM = Less than Significant with Mitigation
SU = Significant/Unavoidable with Mitigation
-- = Less than Significant or No Impact
+ = Impact would be greater under this alternative than under the proposed Project
– = Impact would be less under this alternative than under the proposed Project
= Impact would be same (or similar) under this alternative as under the proposed Project

would temporarily disrupt access to the Del Norte BART station and traffic would need to be detoured to San Pablo Avenue, which would likely result in significant delays at key intersections on San Pablo Avenue (such as those at Macdonald Avenue and Cutting Boulevard).

Under Alternative 3, construction-related noise, air quality and traffic impacts would be shifted to the residential areas east of San Pablo Avenue. Because the Alternative 3 alignment is significantly longer (by 2,600 feet) than the preferred alignment, approximately 20 percent more emissions would be generated. In addition, because the Alternative 3 alignment has over a 100 more customers located along the alignment (377 compared to 258 for the proposed alignment), far more customers would be directly affected by construction on their street. Because construction of Alternative 3 would require full road closure along a majority of the alignment automobile access to residential areas would be reduced during construction hours.

In addition, the Alternative 3 alignment transects a known and extensive archaeological site and therefore has the potential to result in significant (but mitigable) impacts to archaeological resources.

As shown in Table 4-4, Alternative 3 performs worse than the proposed Project under several EBMUD screening criteria. Alternative 3 has the potential to result in increased construction-related impacts to schools, as it would affect two schools (Fairmount School and Windrush School) instead of one (St. John School). Alternative 3 is located near a landslide risk area and as a result would be exposed to increased hazards from landslides. Finally, existing underground utilities in Key Boulevard are very congested, and would pose a major construction challenge.

While Alternative 3 would likely result in fewer significant traffic related impacts, impacts associated with cultural resources, noise and air quality would be increased, as a result, the proposed alignment is considered the environmentally superior alternative.

## 4.5.5 Central Pressure Zone Pipeline (Richmond/San Pablo)–Alternative Alignment 2

### Proposed Alignment (crossing San Pablo Creek within the EBMUD utility corridor)

Tables 4-5 and 4-9 compare the characteristics and magnitude of impacts associated with the proposed alignment of the Central Pressure Zone Pipeline (Richmond/San Pablo) against Alternative 2 and the No Project Alternative. As shown in Figure 4-4, Alternative 2 avoids 23rd Street and instead runs along several residential streets including 22nd Street, 20th Street and 21st Street. Alternative 2 would cross San Pablo Creek within the EBMUD utility corridor.

Alternative 2 would eliminate traffic impacts associated with construction activities along 23rd Street and would reduce negative impacts to operating conditions at the 23rd Street/San Pablo Avenue/Road 20 and 23rd Street/Rheem Avenue intersections. Because construction would occur on residential streets (22nd Street, 20th Street and 21st Street) with lower traffic volumes, less traffic would need to be detoured and traffic could be routed to 23rd Street, which as an arterial can handle greater volumes of traffic. However, Alternative 2 would transfer construction related noise, air quality and traffic impacts to the residential areas along 22nd Street, 20th Street and 21st Street. Alternative 2 is only 300 feet longer, but 66 more customers are located along this alignment (253 compared to 187 for the proposed alignment). Construction could also affect the Church of Christ located at 2060 Brookside Drive. Construction of Alternative 2 would also require full road closure along a majority of the alignment, resulting in reduced automobile access to these residential areas during construction hours. In addition, Alternative 2 parallels an existing underground high pressure gas line, which could pose a construction hazard.

Alternative 2 would eliminate significant and unavoidable aesthetic impacts associated with optional installation of the pipe bridge adjacent to San Pablo Avenue and would avoid a known archaeological site. Alternative 2 would also avoid disruption of access to the pocket park at 23rd Street and Wildcat Creek resulting from jack and bore construction activities. However, jack and bore construction would be shifted to 21st Street, where residents would be affected. Underground utilities along the alignment of Alternative 2 are very congested, and include high pressure fuel lines which would pose a major construction challenge.

Because the proposed alignment would expose fewer homes to construction related impacts than Alternative 2, the proposed alignment is considered the environmentally superior alternative.

**TABLE 4-9**
**CENTRAL PRESSURE ZONE PIPELINE (RICHMOND/SAN PABLO)**
**EVALUATION OF ALTERNATIVE 2 AND COMPARISON TO THE PROPOSED PROJECT**

| | Proposed Alignment | Alternative 2 | No Project Alternative | Discussion of the Proposed Project and Alternative 2 |
|---|---|---|---|---|
| **Potential Impacts** | | | | |
| Aesthetics | LSM (Proposed Alignment) SU (Optional Alignment) | LSM | -- | Alternative 2 would eliminate significant and unavoidable aesthetic impacts associated with optional installation of the pipe bridge adjacent to San Pablo Avenue. |
| Air Quality | LSM | LSM + | -- | Like the proposed alignment, Alternative 2 would generate short term increases in criteria pollutant emissions during construction. Because Alternative 3 is 800 feet longer, approximately 8% more emissions would be generated. In addition, Alternative 2 would transfer air quality impacts to residential areas and would expose a larger number of homes and residents to air quality impacts. |
| Biological Resources | LSM | LSM = | -- | Like the proposed alignment, construction activities associated with Alternative 2 could adversely affect urban habitat quality as well as special-status species and riparian habitat associated with San Pablo and Wildcat Creeks. |
| Cultural Resources | LSM | LSM – | -- | Construction activities under both the proposed Project and Alternative 2 have the potential to disturb archaeological sites, paleontological resources or human remains and/or could result in vibration levels that have the potential to damage any historic structures located along the alignment. However, Alternative 2 would avoid a known archaeological site. |
| Energy | -- | -- | -- + | Like the proposed alignment, Alternative 2 would improve the efficiency of pumping plants serving the West of Hills area, and extend the useful life of existing EBMUD facilities. |
| Geology and Soils | LSM | LSM = | -- | Issues related to surface fault rupture, liquefaction, groundshaking, landslides, erosion, unstable geologic units and expansive would be similar under the proposed alignment and Alternative 2. |
| Greenhouse Gas Emissions | -- | -- | -- | Because Alternative 2 is 800 feet longer, approximately 8% more emissions would be generated. However, like the proposed alignment, construction- and operations-related GHG emissions under Alternative 3 are expected to result in less-than-significant impacts on climate change. |
| Hazards and Hazardous Materials | LSM | LSM + | -- | Like the proposed alignment, construction of Alternative 2 could expose workers to hazardous materials and/or damage existing utilities. Additionally, Alternative 2 parallels a high pressure gas line which could pose a construction hazard. |
| Hydrology and Water Quality | LSM | LSM = | -- | Like the proposed alignment, construction and dewatering activities under Alternative 2 have the potential to degrade water quality. |
| Noise | SU | SU + | -- | Construction activities under Alternative 2 and the proposed Project would be the similar and would exceed the City of Richmond's noise ordinance. However, since Alternative 2 runs through residential streets as opposed to 23rd Street, noise impacts would |

**TABLE 4-9 (Continued)**
**CENTRAL PRESSURE ZONE PIPELINE (RICHMOND/SAN PABLO)**
**EVALUATION OF ALTERNATIVE 2 AND COMPARISON TO THE PROPOSED PROJECT**

| | Proposed Alignment | Alternative 2 | No Project Alternative | Discussion of the Proposed Project and Alternative 2 |
|---|---|---|---|---|
| **Potential Impacts (cont.)** | | | | |
| Noise (cont.) | | | | be shifted to residential areas. In addition, more residents are located along the Alternative 2 alignment compared to the proposed alignment; therefore, impacts to sensitive receptors would be higher under Alternative 2. |
| Recreation | LSM | LSM – | -- | Alternative 2 would avoid disruption of access to the pocket park at 23rd Street and Wildcat Creek. |
| Transportation and Traffic | LSM | LSM + | -- | Alternative 2 would eliminate traffic impacts associated with construction activities along 23rd Street and would reduce negative impacts to operating conditions at the 23rd Street/San Pablo Avenue/Road 20 and 23rd Street/Rheem Avenue intersections. However, construction of Alternative 2 would affect more homes than the proposed alignment and would require full road closure along a majority of the alignment, resulting in reduced automobile access to these residential areas during construction hours. |

Legend:
LSM = Less than Significant with Mitigation
SU = Significant/Unavoidable with Mitigation
-- = Less than Significant or No Impact
+ = Impact would be greater under this alternative than under the proposed Project
– = Impact would be less under this alternative than under the proposed Project
= Impact would be same (or similar) under this alternative as under the proposed Project

## Optional Pipe Bridge Locations

This EIR analyzes two pipe bridge locations at San Pablo Creek – the proposed alignment within an existing EBMUD utility corridor, and an optional alignment adjacent to San Pablo Avenue. Section 3.2, Aesthetics, identifies that under the San Pablo Avenue Option, the pipe bridge would partially obstruct views of San Pablo Creek and the adjacent vegetated banks from the San Pablo Avenue bridge and pedestrian walkway. If this option is selected, the bridge may be developed as a combined pipe and pedestrian bridge to replace the existing pedestrian walkway of the San Pablo Avenue Bridge. However, due to the uncertainty in coordinating these two projects, it is not clear that this option is feasible. As a result, the impact of this optional alignment is considered significant and unavoidable. While the proposed option of using the existing EBMUD utility corridor would require tree removal and would therefore affect riparian habitat along San Pablo Creek, this impact would happen regardless of whether the pipe bridge is located in the corridor. As identified in Section 2.6, the proposed Project includes tree removal within the EBMUD utility corridor to protect an existing pipeline regardless of whether the pipeline is developed here or if it is developed near San Pablo Avenue under the San Pablo Avenue Option. Because the proposed alignment would avoid the significant aesthetic impacts associated with the San Pablo Avenue Option, the proposed alignment is considered the environmentally superior option.

# References

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URS Corporation, 2007. Bay Area Regional Desalination Project Feasibility Study. July 2007.

# CHAPTER 5
# Cumulative Impacts

Cumulative impacts, as defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects that, when taken together, are "considerable" or that compound or increase other environmental impacts. A cumulative impact from several projects is the change in the environment that would result from the incremental impact of the project when added to those of other closely related past, present, or reasonably foreseeable future projects. Pertinent guidance for cumulative impact analysis is provided in Section 15130 of the CEQA Guidelines:

- An EIR shall discuss cumulative impacts of a project when the project's incremental effect is "cumulatively considerable" (e.g., the incremental effects of an individual project are considerable when viewed in connection with the effects of past, current, and probable future projects, including those outside the control of the agency, if necessary).
- An EIR should not discuss impacts that do not result in part from the project evaluated in the EIR.
- A project's contribution is less than cumulatively considerable, and thus not significant, if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.
- The discussion of impact severity and likelihood of occurrence need not be as detailed as for effects attributable to the project alone.
- The focus of analysis should be on the cumulative impact to which the identified other projects contribute, rather than on attributes of the other projects that do not contribute to the cumulative impact.

The cumulative impact analysis for each individual resource topic is included below in Section 5.3.

## 5.1 Approach to Cumulative Impact Analysis

Two approaches to a cumulative impact analysis are provided in CEQA Guidelines Section 15130(b)(1): (a) the analysis can be based on a list of past, present, and probable future projects producing related or cumulative impacts, or (b) a summary of projections contained in a general plan or related planning document can be used to determine cumulative impacts. For the purpose of this EIR, the analysis employs the list-based approach. The following factors were used to determine an appropriate list of projects to be considered in this cumulative analysis:

- ***Similar Environmental Impacts.*** A relevant project contributes to effects on resources that are also affected by the proposed project. A relevant future project is defined as one that is "reasonably foreseeable," such as a proposed project for which an application has been filed with the approving agency or has approved funding.

- ***Geographic Scope and Location.*** A relevant project is located within the defined geographic scope for the cumulative effect.
- ***Timing and Duration of Implementation.*** Effects associated with activities for a relevant project (e.g., short-term construction or demolition, or long-term operations) would likely coincide in timing with the effects of the proposed project.

### 5.1.1 Other Projects with Similar Environmental Impacts

Projects that are relevant to the cumulative analysis include those that could contribute incremental effects on the same environmental resources and would have similar environmental impacts as those discussed in this EIR. The cumulative impact discussions below analyze the potential cumulative impacts that could occur when the impacts of the proposed project are considered in combination with the impacts of other past, present, and reasonably foreseeable future projects. It should be noted that the reasonably foreseeable future projects are subject to independent environmental review and consideration by approving agencies. Consequently, it is possible that some of the reasonably foreseeable future projects will not be approved or will be modified prior to approval (e.g., as a result of the CEQA alternatives process). For the purposes of assessing worst-case cumulative impacts, however, the cumulative impact analysis is premised on the approval and construction of all of the relevant projects listed in **Table 5-1**. The location of each site listed in this table is shown on **Figures 5-1**, **5-2**, and **5-3**. Section 5.2 provides a brief description of the key projects in the vicinity of the proposed pipeline alignments.

### 5.1.2 Geographic Scope and Location

The geographic scope of cumulative projects is dependent on the resource topic affected and is identified at the beginning of each cumulative impact discussion. In general, the geographic scope includes the areas adjacent to the proposed pipelines and would use the same roadways during construction. For some resource topics, the geographic scope can extend farther; for example, to the regional roadway network or regional air basin.

### 5.1.3 Timing and Duration of Implementation

The Wildcat Pipelines are anticipated to be constructed from approximately mid-2015 to mid-2017 and the Central Pressure Zone Pipelines are anticipated to be constructed between 2021 and 2022. Currently available project planning information generally includes projects that may be conducted in the near term. In the case of public works projects such as street repairs and pipeline construction, repair, and replacement projects, the Capital Improvement Plans for Berkeley, El Cerrito, Richmond, and San Pablo generally include projects only about two years into the future beyond 2012. Therefore, it is difficult to identify specific reasonably foreseeable projects that may have construction schedules overlapping with the West of Hills Northern Pipelines Project from 2015 to 2017 and 2021 to 2022. Those projects included in Table 5-1 are those that can be projected based on currently available information, and are generally representative of the types of projects and potential cumulative impacts that could occur further in the future.

**TABLE 5-1**
**PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS**

| Cumulative Project No. | Jurisdiction | Project Name | Project Sponsor(s) | Project Description | Proximity to Project Area | Estimated Construction Schedule / Status |
|---|---|---|---|---|---|---|
| **Wildcat Pipeline (Berkeley)Construction Date 2015-2017** | | | | | | |
| B-1 | Berkeley | Ashby Avenue/ Tunnel Road Improvements | Caltrans | Improvements on the State Route 13 corridor (Ashby Avenue and Tunnel Road), including signalization and signal light timing, bicycle transit improvements, pedestrian improvements, and other improvements to be determined. (Berkeley, 2011) | Intersects alignment and corridor is used as truck route | 2012-2014 |
| B-2 | Berkeley | 2855 Telegraph Avenue | Metro PCS | Add microwave dishes. (Berkeley, 2012) | 500 feet | Current zoning application |
| B-3 | Berkeley | Ashby/I-80 Interchange Improvements | Metropolitan Transportation Commission | Reconstruct the Ashby Avenue Interchange on I-80 including construction of a new bridge to replace the two existing bridges and construction of two roundabouts. (Berkeley, 2011; ATCA, 2011) | On truck route | FY 2015 |
| **B-4** | **Berkeley** | **Sewer Replacement Project** | **City of Berkeley** | **Sewer replacement on Dana Street between Parker and Derby Streets. (Berkeley, 2011)** | **Overlaps alignment** | **FY 2014** |
| **B-5** | **Berkeley** | **Sewer Replacement Project** | **City of Berkeley** | **Sewer replacement on Parker Street between Chilton Way and Fulton Streets. (Berkeley, 2011)** | **Intersects alignment** | **FY 2014** |
| B-6 | Berkeley | Sewer Replacement Project | City of Berkeley | Sewer replacement on Tanglewood Road between Derby and Garber Streets. (Berkeley, 2011) | Intersects alignment | FY 2014 |
| | Berkeley | Sewer Replacement Project | City of Berkeley | Sewer replacement on Claremont Boulevard between Derby and Garber Streets. (Berkeley, 2011) | | FY 2014 |
| | Berkeley | Sewer Replacement Project | City of Berkeley | Sewer replacement on Claremont Boulevard between Derby and Garber Streets. (Berkeley, 2011) | | FY 2014 |
| | Berkeley | Sewer Replacement Project | City of Berkeley | Sewer replacement on Garber Street between Claremont Boulevard and Oak Knoll Terrace. (Berkeley, 2011) | | FY 2014 |
| | Berkeley | Sewer Replacement Project | City of Berkeley | Sewer replacement on Forest Avenue between Claremont Boulevard and 2910 Forest Avenue. (Berkeley, 2011) | | FY 2014 |
| | Berkeley | Sewer Replacement Project | City of Berkeley | Sewer replacement on Belrose/Derby/Tanglewood Road backline between Derby and Garber. (Berkeley, 2011) | | FY 2014 |
| B-7 | Berkeley | Sewer Replacement Project | City of Berkeley | Sewer replacement on Haste Street between College and Shattuck Avenues. (Berkeley, 2011) | 1,000 feet | FY 2014 |

**TABLE 5-1 (Continued)**
**PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS**

| Cumulative Project No. | Jurisdiction | Project Name | Project Sponsor(s) | Project Description | Proximity to Project Area | Estimated Construction Schedule / Status |
|---|---|---|---|---|---|---|
| **Wildcat Pipeline (Berkeley)Construction Date 2015-2017 (cont.)** | | | | | | |
| B-8 | Berkeley | Sewer Replacement Project | City of Berkeley | Sewer replacement on Bowditch Street between Channing and Dwight Streets. (Berkeley, 2011) | 1,500 feet | FY 2014 |
| B-9 | Berkeley | Sewer Replacement Project | City of Berkeley | Sewer replacement on Telegraph Avenue between Bancroft and Dwight Ways. (Berkeley, 2011) | 1,000 feet | FY 2014 |
| B-10 | Berkeley | Sewer Replacement Project | City of Berkeley | Sewer replacement on Dwight Way between College and Telegraph Avenues. (Berkeley, 2011) | 1,000 feet | FY 2014 |
| B-11 | Berkeley | Sewer Replacement Project | City of Berkeley | Sewer replacement on Dana Street between Channing Way and Haste Street. (Berkeley, 2011) | 1,000 feet | FY 2014 |
| B-12 | Berkeley | Sewer Replacement Project | City of Berkeley | Sewer replacement on Ellsworth Street between Dwight Way and Blake Street. (Berkeley, 2011) | 750 feet | FY 2014 |
| B-13 | Berkeley | Storm Drain Project | City of Berkeley | Rehabilitation of storm drain system at Dwight Way and Piedmont Avenue as part of Berkeley's Clean Storm Water Capital Improvement Program. (Berkeley, 2011) | ½ mile | FY 2014 |
| B-14 | Berkeley | Sewer Replacement Project | City of Berkeley | Sewer replacement on El Camino Real between Domingo Street and the Uplands. (Berkeley, 2011) | 750 feet | FY 2014 |
| B-15 | Berkeley | Street Rehabilitation Project | City of Berkeley | Street repair project on Brookside Avenue from Claremont Avenue to dead end. (Berkeley, 2011) | 200 feet | FY 2015 |
| | Berkeley | Street Rehabilitation Project | City of Berkeley | Street repair project on Brookside Drive from Claremont Avenue to Claremont Avenue. (Berkeley, 2011) | | FY 2015 |
| | Berkeley | Street Rehabilitation Project | City of Berkeley | Street repair project on Brookside Court from Brookside Drive to dead end. (Berkeley, 2011) | | FY 2015 |
| B-16 | Berkeley | 2506 Dwight Way | Private | Relocate historic Woolley and Blood houses; rehabilitate and reuse structures. (Berkeley, 2012) | 1,000 feet | Current zoning application |
| B-17 | Berkeley | 3139 Eaton Street | Private | Two-story accessory building. (Berkeley, 2012) | 300 feet | Current zoning application |
| B-18 | Berkeley | 2517 Regent Street | Private | Demolish 5-unit apartment building and construct new 12-unit apartment building. (Berkeley, 2012) | 1,000 feet | Current zoning application |

**TABLE 5-1 (Continued)**
**PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS**

| Cumulative Project No. | Jurisdiction | Project Name | Project Sponsor(s) | Project Description | Proximity to Project Area | Estimated Construction Schedule / Status |
|---|---|---|---|---|---|---|
| **Wildcat Pipeline (Berkeley)Construction Date 2015-2017 (cont.)** | | | | | | |
| **B-19** | **Berkeley** | **2412 Stuart Street** | **Private** | **Convert 5 units to 4 units. (Berkeley, 2012)** | **On alignment** | **Current zoning application** |
| B-20 | Berkeley | 2525 Telegraph Avenue | Private | Expansion of a commercial building. (Berkeley, 2012) | 1,000 feet | Current zoning application |
| B-21 | Berkeley | 2504 Dana Street | Private | Establish 3 dwellings, and construct residential addition and remodel. (Berkeley, 2012) | 500 feet | Current zoning application |
| B-22 | Berkeley | 2942 Domingo | Sprint Telecom | Remove and replace three antennas. (Berkeley, 2012) | 1,500 feet | Current zoning application |
| B-23 | Berkeley | 2501 to 2509 Haste Street | Private | Remove 2 existing structures and construct a 6-story mixed use building. (Berkeley, 2012) | ½ mile | Current zoning application |
| **B-24** | **Berkeley** | **67 Parkside** | **Private** | **Construct a 290-foot, two-story residential addition (Berkeley, 2012)** | **Adjacent to alignment** | **Current zoning application** |
| B-25 | Berkeley | 2999 Regent Street | Sprint | Remove and replace antennas. (Berkeley, 2012) | 350 feet | Current zoning application |
| **B-26** | **Berkeley** | **2510 Stuart Street** | **Private** | **Convert duplex to single-family dwelling. (Berkeley, 2012)** | **On pipeline route** | **Current zoning application** |
| B-27 | Berkeley | 2526 Webster Street | Private | Demolish existing building and construct a new accessory building. (Berkeley, 2012) | 100 feet | Current zoning application |
| **B-28** | **Berkeley** | **Parker Street and Dana Street Projects** | **EBMUD** | **Install 6-inch diameter water pipeline on Dana Street between Carleton Street and Blake Street, and on Parker Street between Ellsworth Street and Dana Street as part of the Pipeline Infrastructure Renewal Project. (EBMUD, 2012b)** | **Adjacent to and overlapping alignment** | **Uncertain** |

**TABLE 5-1 (Continued)**
**PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS**

| Cumulative Project No. | Jurisdiction | Project Name | Project Sponsor(s) | Project Description | Proximity to Project Area | Estimated Construction Schedule / Status |
|---|---|---|---|---|---|---|
| **Wildcat Pipeline (Berkeley)Construction Date 2015-2017 (cont.)** | | | | | | |
| B-29 | Berkeley | Phase 1A of East Bayshore Project | EBMUD | Supply 0.5 million gallons per day of recycled water to portions of Albany, Berkeley, Emeryville, and Oakland for irrigation, industrial, commercial, and environmental uses. Phase 1A includes a pipeline along I-80, distribution pipelines in Berkeley and Albany, and customer retrofits. (EBMUD, 2011b) | Greater than ½ mile | FY 2014, depending on funding |
| B-30 | Berkeley | Aqueducts at Claremont Center | EBMUD | Replace 2,400 feet of 54-inch pipeline located at Claremont Center. The three pipelines consist of the Sequoia, Wildcat, and 59th St Aqueducts. (EBMUD, 2011b) | 1,700 feet | 2012 – 2014 |
| B-31 | Berkeley | Dingee Pumping Plant Discharge Line Replacement | EBMUD | Replace 12,000 feet of 24-inch discharge pipeline from the Dingee Pumping Plant, located in the Claremont Center. The new alignment includes Golden Gate Avenue, Proctor Avenue, and Harbord Avenue, to Moraga Road in Oakland. (EBMUD, 2011b) | 1,700 feet | 2012 – 2013 |
| B-32 | Berkeley | Summit South Pumping Plant Rehabilitation | EBMUD | This project will replace three pumps, much of the interior piping and valves, and some of the electrical equipment at the Summit South Pumping Plant. No improvements are planned for the existing pumping plant building. (EBMUD, 2012a) | 1,700 feet | 2017 – 2018 |
| B-33 | Berkeley | Webster Rate Control Station Rehabilitation | EBMUD | This is an existing rate control station with a 16-inch valve. EBMUD is still evaluating the improvements required to rehabilitate this facility. (EBMUD, 2012a) | 750 feet | 2017 |
| B-34 | Oakland | Stonewall Reservoir Rehabilitation | EBMUD | Stonewall Reservoir is an existing 200,000 gallon welded steel tank commission in 1931. This project will install perimeter fencing, paint over graffiti, install a hand rail on the stairway up to the tank, replace the electronic telemetry, and install 36-inch manways into the steel tank. (EBMUD, 2011b) | Greater than ½ mile, uses same truck route | 2015 – 2016 |
| B-35 | Oakland | Summit South Reservoir Rehabilitation | EBMUD | Summit South is an existing 1.5 MG concrete tank. The project will replace joint sealant inside the tank, replace the valves and piping inside the valve pit, and install new electronic telemetry. (EBMUD, 2011b) | Greater than ½ mile, uses same truck route | 2012 – 2013 |
| No Number | Berkeley | Sidewalk Repair Program | City of Berkeley | Ongoing program for repair or replacement of sidewalks in various locations throughout the City of Berkeley. (Berkeley, 2011) | Various locations | Ongoing |

**TABLE 5-1 (Continued)**
**PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS**

| Cumulative Project No. | Jurisdiction | Project Name | Project Sponsor(s) | Project Description | Proximity to Project Area | Estimated Construction Schedule / Status |
|---|---|---|---|---|---|---|
| **Wildcat Pipeline (Berkeley)Construction Date 2015-2017 (cont.)** | | | | | | |
| No Number | Berkeley | Sewer Lateral Inspection and Rehabilitation Project | City of Berkeley | Ongoing sewer lateral inspection and rehabilitation program. Currently unfunded. (Berkeley, 2011) | Various locations | FY 2012-FY 2014 |
| No Number | Berkeley | Clean Storm Projects | City of Berkeley | Improvements to City of Berkeley storm drain system. Currently unfunded. (Berkeley, 2011) | Various locations | FY 2011 – FY 2015 |
| **Wildcat (El Cerrito) – Construction Date 2015-2016** | | | | | | |
| EC-1 | El Cerrito and Richmond | San Pablo Avenue Specific Plan | Cities of El Cerrito and Richmond | Develop San Pablo Avenue between the southern boundary of El Cerrito and Macdonald Avenue as a mixed-use corridor. Visions for the development include providing new mixed uses, retail, and office development, providing high-quality, well-designed buildings, improving the pedestrian environment, and concentrating housing near transit such as the Del Norte BART station. (MIG, 2010) The plan is currently undergoing adoption. | 1,500 feet | Uncertain |
| EC-2 | El Cerrito | Interstate 80/ Central Avenue Interchange Improvements | Cities of El Cerrito and Richmond | Improve traffic conditions at the I-80/ Central Avenue Interchange in two phases. Phase 1 includes operational improvements such as extinguishable messaging signs and redirection of I-80 westbound ramp traffic. Phase 2, referred to as the Local Roads Realignment Project, will include improving signalized intersections spacing along Central Avenue by connecting Pierce Street to San Mateo Street, converting Pierce Street access at Central Avenue to "right in, right out", and relocating the traffic signal at Pierce Street/Central Avenue to the San Mateo Street/Central Avenue intersection. (CCTA, 2011) | 4,000 feet | 2014-2015 |
| EC-3 | El Cerrito | Construction and Renovation of Castro Elementary School to Replace the Portola Middle School | West Contra Costa Unified School District | Demolition of several existing buildings and portables, renovation of the existing main Castro Elementary School buildings, and construction of new buildings for a gymnasium, library, administration, and classrooms. (WCCUSD, 2008) | 1,000 feet | 2012 – 2015 |
| EC-4 | El Cerrito | Reconstruction of Fairmont School | West Contra Costa Unified School District | Reconstruction of the existing school building which will occupy roughly the same positions as the current school. It is expected that students will remain on the current Fairmont campus, with temporary buildings placed on the existing play field. (Fairmont School, 2012) | 1,000 feet | Uncertain, end of construction could be 2014 to 2017 |

**TABLE 5-1 (Continued)**
**PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS**

| Cumulative Project No. | Jurisdiction | Project Name | Project Sponsor(s) | Project Description | Proximity to Project Area | Estimated Construction Schedule / Status |
|---|---|---|---|---|---|---|
| **Wildcat (El Cerrito) – Construction Date 2015-2016 (cont.)** | | | | | | |
| EC-5 | El Cerrito | Moeser Lane and Ashbury Avenue Pedestrian and Bicycle Corridor Improvements | City of El Cerrito | Construct pedestrian and bicycle corridor improvements on Moeser Lane and Ashbury Avenue, including closing sidewalk gaps, installing pedestrian safety and traffic calming measures, and installing Class II and III bicycle facilities. (El Cerrito, 2012) | 750 feet | Uncertain |
| **EC-6** | **El Cerrito** | **Eden Housing San Pablo Avenue Senior Apartments** | **Eden Housing** | **Construct 64-units of affordable senior housing at 10848 and 10860 San Pablo Avenue. (El Cerrito, 2012b).** | **Adjacent to pipeline route** | **Uncertain**<br>**CEQA review initiated 2013** |
| **EC-7** | **El Cerrito** | **Norvel Street Project** | **EBMUD** | **Install 6-inch diameter water pipeline on Norvel Street between Central Avenue and Fairmount Avenue as part of the Infrastructure Renewal Project. (EBMUD, 2012b)** | **Overlaps pipeline route** | **2015-2017** |
| **EC-8** | **El Cerrito** | **Behrens Street Project** | **EBMUD** | **Install 6-inch diameter water pipeline on Behrens Street between Fairmount Avenue and Spokane Avenue as part of the Infrastructure Renewal Project. (EBMUD, 2012b)** | **Overlaps and adjacent to pipeline route** | **2015-2017** |
| EC-9 | Kensington | San Pablo Rate Control Station Rehabilitation | EBMUD | Rehabilitate or repair the San Pablo Rate Control Station as part of the rate control station rehabilitation program. (EBMUD, 2011a) | 750 feet | 2016 |
| No Number | El Cerrito | Traffic Safety Improvement Program | City of El Cerrito | Various projects to improve safety for motorists, pedestrians, and bicyclists travelling on city streets. (El Cerrito, 2011) | Locations throughout the City of El Cerrito | 2014-2015<br>2016-2017 |
| **Central Pressure Zone (El Cerrito/Richmond) Construction Date 2021** | | | | | | |
| **EC-1** | **El Cerrito and Richmond** | **San Pablo Avenue Specific Plan** | **Cities of El Cerrito and Richmond** | **Develop San Pablo Avenue between the southern boundary of El Cerrito and Macdonald Avenue as a mixed-use corridor. Visions for the development include providing new mixed uses, retail, and office development, providing high-quality, well-designed buildings, improving the pedestrian environment, and concentrating housing near transit such as the Del Norte BART station. (MIG, 2010) The plan is currently undergoing adoption.** | **Overlaps alignment** | **Uncertain** |
| **EC-10** | **El Cerrito** | **Sutter Avenue Project** | **EBMUD** | **Install 6-inch diameter water pipeline on Sutter Avenue between Carlson Boulevard and San Pablo Avenue as part of the Infrastructure Renewal Project. (EBMUD, 2012b)** | **Adjacent to alignment** | **Uncertain** |

**TABLE 5-1 (Continued)**
**PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS**

| Cumulative Project No. | Jurisdiction | Project Name | Project Sponsor(s) | Project Description | Proximity to Project Area | Estimated Construction Schedule / Status |
|---|---|---|---|---|---|---|
| **Central Pressure Zone (El Cerrito/Richmond) Construction Date 2021 (cont.)** | | | | | | |
| EC-11 | El Cerrito | Potrero Regulator Rehabilitation | EBMUD | Install a new access vault, repair corrosion damage, replace mechanical components, install a sump pump, and install new electronic telemetry. (EBMUD, 2012a) | 1,000 feet | 2018 |
| EC-12 | Kensington | San Pablo Clearwell | EBMUD | Demolish existing 5.4 million gallon reservoir and replace with a 5.4 million gallon tank (EBMUD, 2011b) | Greater than ½ mile, uses same truck route | 2016-2019 |
| EC-13 | El Cerrito | Summit North Pumping Plant Rehabilitation | EBMUD | Upgrade pumping plant to conform to EBMUD standards to ensure efficient, reliable, and safe operation. (EBMUD, 2011b) | Greater than ½ mile, uses same truck route | 2018 – 2019 |
| **Wildcat (El Cerrito) – Construction Date 2015-2017 and Central Pressure Zone (El Cerrito/Richmond) Construction Date 2021** | | | | | | |
| **No Number** | **El Cerrito** | **PDA Streetscape Improvements** | **City of El Cerrito** | **Construct streetscape improvements within and around the San Pablo Avenue Priority Development Area which includes all of San Pablo Avenue and crossing arterials leading to the El Cerrito Plaza and Del Norte BART stations. Planned improvements include sidewalk replacement, pedestrian level lighting, crosswalk improvements (curb bulb-outs, pedestrian refuge islands, and enhanced signing and striping), bike route signing and striping, street trees, and street furniture. (El Cerrito, 2011)** | **Overlaps with Central Pressure Zone (El Cerrito/Richmond) pipeline alignment** | **2015-2020** |
| No Number | El Cerrito | City Wide Solar Photo Voltaic | City of El Cerrito | Install approximately 350 kilowatts of solar photovoltaic panels on all economically feasible municipal buildings in order to convert an estimated 25 percent of the City's total electricity use to renewable energy. (El Cerrito, 2011) | Locations throughout the City of El Cerrito | 2011-2021 |
| No Number | El Cerrito | Urban Forest Program | City of El Cerrito | Ongoing effort to develop, plan, and implement the planting of additional street trees as recommended in the Urban Forest Management Plan. Over 1,000 trees have been already installed. (El Cerrito, 2011) | Locations throughout the City of El Cerrito | 2013-2021 |
| No Number | El Cerrito | Street Improvement Program | City of El Cerrito | Design of a variety of roadway treatments including slurry seal, micropave, cape seal, asphalt overlay of various thicknesses, and repairs of failed sections. The program also includes installation of curb ramps in compliance with the Americans with Disabilities Act for all streets that receive an overlay treatment; curb, gutter, and sidewalk upgrades (as needed); and upgrades to traffic control systems. This project also funds the bi-annual Pavement Management Program Upgrade. (El Cerrito, 2011) | Locations throughout the City of El Cerrito | 2011-2021 |

**TABLE 5-1 (Continued)**
**PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS**

| Cumulative Project No. | Jurisdiction | Project Name | Project Sponsor(s) | Project Description | Proximity to Project Area | Estimated Construction Schedule / Status |
|---|---|---|---|---|---|---|
| **Wildcat (El Cerrito) – Construction Date 2015-2017 and Central Pressure Zone (El Cerrito/Richmond) Construction Date 2021 (cont.)** | | | | | | |
| No Number | El Cerrito | Access Modifications - Streets | City of El Cerrito | Implement the streets portion of the City's Americans with Disability Act Transition Plan Update adopted in 2009. Improvements will be made to major pedestrian routes in the public right-of-way to eliminate obstructions. (El Cerrito, 2011) | Locations throughout the City of El Cerrito | 2011-2021 |
| **Central Pressure Zone (Richmond/San Pablo) 2021** | | | | | | |
| RSP-1 | San Pablo | Davis Park Master Plan | City of San Pablo | Upgrades to the existing Davis Park including a new community center with an amphitheater, playgrounds, plazas, and basketball court; recreational facilities including baseball/soccer fields and amenities; a new maintenance building; restoration of Wildcat Creek; and construction of four new bridges across Wildcat Creek. (San Pablo, 2012a) | 250 feet | Creek restoration 2012<br>Full build out uncertain |
| RSP-2 | San Pablo | Burlington Northern Santa Fe Site | City of San Pablo | Redevelopment of a 4-acre industrial site by the San Pablo Redevelopment Agency for industrial condominiums. The site is contaminated, but is being remediated with regulatory oversight by the California Department of Toxic Substances Control. Funding for this project is uncertain since redevelopment agency was eliminated in December 2011. (San Pablo, 2012b) | ½ mile | Uncertain |
| RSP-3 | San Pablo | Circle S Project Area | City of San Pablo and Private | Redevelopment of a 12.2-acre site previously occupied by the Davis Lumberyard, Chattleton Lane Homes, Salvation Army Site, and Circle S and Alvarado mobile home parks as a mixed use project. Mixed uses will include housing, retail, entertainment, and open space. Funding for this project is uncertain since redevelopment agency was eliminated in December 2011. (San Pablo, 2012b) | 1,600 feet | Uncertain |
| RSP-4 | San Pablo | Helms Community Center | City of San Pablo and Private | Development of a community center at Helms Middle School. The City is seeking funding opportunities to build this project. (San Pablo, 2012b) | 1,000 feet | Uncertain |
| RSP-5 | San Pablo | Market and Rumrill | City of San Pablo | Development of a business incubator and/or training center on this ½ acre site. Funding for this project is uncertain since redevelopment agency was eliminated in December 2011. (San Pablo, 2012b) | ½ mile | Uncertain |

**TABLE 5-1 (Continued)**
**PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS**

| Cumulative Project No. | Jurisdiction | Project Name | Project Sponsor(s) | Project Description | Proximity to Project Area | Estimated Construction Schedule / Status |
|---|---|---|---|---|---|---|
| **Central Pressure Zone (Richmond/San Pablo) 2021 (cont.)** | | | | | | |
| RSP-6 | San Pablo | Mission Plaza – International Student Housing | City of San Pablo and Contra Costa College | Development of this 1.5-acre site as housing for international students attending Contra Costa College and other colleges in the Bay Area. This project will likely include a five-story mixed use building including 80 living units and up to 150,000 square feet of commercial retail space. Funding for this project is uncertain since redevelopment agency was eliminated in December 2011. (San Pablo, 2012b) | 1,600 feet | Uncertain |
| **RSP-7** | **San Pablo** | **Powell Place** | **City of San Pablo** | **Development of this ½-acre lot in Old Town as a mixed-use project consisting of commercial uses below housing or office uses. Funding for this project is uncertain since redevelopment agency was eliminated in December 2011. (San Pablo, 2012b)** | **On alignment** | **Uncertain** |
| RSP-8 | San Pablo | West County Health Center | Contra Costa County Health Services Department | Replace the existing 32,000-square-foot Richmond Health Center at 13613 San Pablo Avenue with a new 53,000-square-foot 2-story medical facility. (CCCHSD, 2010) | 2,500 feet | Constructed in 2012 |
| RSP-9 | Richmond/ San Pablo | Contra Costa Pipeline | Praxair | Praxair Inc. is proposing to develop an approximately 21.3-mile hydrogen pipeline from the Chevron Richmond Refinery in Richmond to the Shell Refinery in Martinez, which includes a 1.1-mile lateral pipeline extension to the Conoco Phillips Refinery in Rodeo. The pipeline would transport hydrogen produced at the Chevron Refinery and not required for Chevron's own operations to the Shell and Conoco Phillips refineries. The pipeline would consist of approximately 13.5 miles of new pipeline and the reuse of approximately 7.8 miles of an existing Chevron pipeline used by Pacific Gas and Electric (PG&E) to transport natural gas. The project would also include the construction of approximately 2.2 miles of natural gas pipeline for PG&E's use in replacing the existing backup supply of natural gas from PG&E to the Chevron Richmond Refinery. (Praxair, 2009) | Greater than ½ mile | Uncertain |
| RSP-10 | Richmond | High Density Mixed Use | City of Richmond | Construct high density mixed use development at the former AC Transit bus yard at McDonald Avenue and 22nd Street. (Richmond, 2013) | Overlaps alignment | Uncertain |

**TABLE 5-1 (Continued)
PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS**

| Cumulative Project No. | Jurisdiction | Project Name | Project Sponsor(s) | Project Description | Proximity to Project Area | Estimated Construction Schedule / Status |
|---|---|---|---|---|---|---|
| **Central Pressure Zone (Richmond/San Pablo) 2021 (cont.)** | | | | | | |
| **RSP-11** | **Richmond** | **Nevin Streetscape – East of BART** | **City of Richmond** | **Construct streetscape improvements on Nevin Street to create a pedestrian friendly route between the Civic Center, BART and Amtrak, and multi-modal transit station housing. (Richmond, 2011)** | **Intersects alignment** | **2013 - 2015** |
| RSP-12 | Richmond | Richmond Transit Village | The Olson Company | Construction of 231 housing units in a 16.7 acre area centered around the Richmond BART/Amtrak inter-modal station. (Richmond, 2011) | 1,500 feet | 2013 – 2015 |
| **RSP-13** | **San Pablo** | **Dover Avenue Project** | **EBMUD** | **Install 6-inch water pipeline on Dover Avenue between 23rd Street and Powell Street as part of the Infrastructure Renewal Project. (EBMUD, 2012b)** | **Intersects alignment** | **Unknown** |
| **RSP-14** | **Richmond** | **Downer Avenue Project** | **EBMUD** | **Install water pipeline on Downer Avenue between 23rd Street and 25th Street as part of the Infrastructure Renewal Project. (EBMUD, 2012b)** | **Intersects alignment** | **Unknown** |
| RSP-15 | San Pablo | Road 24, No. 1 Pumping Plant Rehabilitation | EBMUD | Upgrade pumping plant to conform to EBMUD standards to ensure efficient, reliable, and safe operation. (EBMUD, 2011b) | Greater than ½ mile, north of Wildcat Creek | 2017 – 2018 |
| RSP-16 | San Pablo | Schapiro Pumping Plant Rehabilitation | EBMUD | Upgrade pumping plant to conform to EBMUD standards to ensure efficient, reliable, and safe operation. (EBMUD, 2011b) | Greater than ½ mile, north of Wildcat Creek | 2017 – 2018 |
| RSP-17 | San Pablo | San Pablo Dam Interchange Project | Caltrans and Contra Costa Transportation Authority | Reconstruct the I-880/San Pablo Dam Road and I-880/ McBryde Avenue interchanges to improve traffic operations, reduce traffic congestion, provide efficient and safe bicycle/pedestrian access at the interchange, and accommodate future traffic volumes on San Pablo Dam Road. (CCTA, 2012) | Greater than ½ mile, on truck route | 2014 – 2015 |
| RSP-18 | San Pablo | Rumrill Bridge Replacement | City of San Pablo | Replace bridge over San Pablo Creek and associated improvements at Rumrill/Brookside intersection immediately adjoining bridge. (CCTA, 2009) | 1,800 feet, crosses San Pablo Creek | Completed in 2012 |
| RSP-19 | San Pablo | Wildcat Creek Regional Trail: Construct Bridge over Railroads | East Bay Regional Park District | Construct a bridge for the Wildcat Regional Trail across the South Pacific, Atchison Topeka and Santa Fe railroad tracks. (CCTA, 2009) | 2,500 feet | Uncertain |

**TABLE 5-1 (Continued)**
**PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS**

| Cumulative Project No. | Jurisdiction | Project Name | Project Sponsor(s) | Project Description | Proximity to Project Area | Estimated Construction Schedule / Status |
|---|---|---|---|---|---|---|
| **Central Pressure Zone (Richmond/San Pablo) 2021 (cont.)** | | | | | | |
| **RSP-20** | **San Pablo** | **Wildcat Creek Trail, Davis Park to 23rd Street, and City Park** | **City of San Pablo** | **Construct a paved trail along Wildcat Creek for pedestrians and bicyclists, including restoration of a segment of Wildcat Creek to improve bank stability. This segment will include a bridge over Wildcat Creek and will complete the trail connection between Rumrill Boulevard and 23rd Street in the City of San Pablo. A city park will be constructed on a vacant city lot at the trailhead on 23rd Street. The Wildcat Creek Trail will connect to the Bay and Ridge trails in the future. (San Pablo, 2012b)** | **Intersects alignment, follows Wildcat Creek** | 2014 |
| **RSP-21** | **San Pablo** | **Wildcat Creek Trail, 23rd Street to Eastern San Pablo City Limit** | **City of San Pablo** | **Construct a paved trail along Wildcat Creek for pedestrians and bicyclists between 23rd Street and eastern border of the City of San Pablo. (CCTA, 2009)** | **Intersects alignment, follows Wildcat Creek** | **Uncertain** |
| RSP-22 | San Pablo | Creek Daylighting | City of San Pablo | Daylight Wildcat Creek at Davis Park. (San Pablo, 2012) | 500 feet | 2012 |
| **RSP-23** | **San Pablo** | **23rd Street Specific Plan** | **City of San Pablo** | **The 23rd Street Specific Plan provides a long-term strategy to revitalize and increase the development potential for 23rd Street between San Pablo Avenue and Pine Avenue as a clearly identifiable and economically viable mixed-use corridor. (DCE, 2007)** | **Overlaps with pipeline alignment** | **Uncertain** |
| **RSP-24** | **San Pablo** | **San Pablo Avenue Specific Plan** | **City of San Pablo** | **The broad objective of the San Pablo Avenue Specific Plan is to foster revitalization of San Pablo Avenue into a pedestrian- and transit-oriented boulevard, with amenities that draw residents from the entire city and surrounding region. The Plan also provides a framework for development on major opportunity sites, and helps integrate new development with key activity centers like Contra Costa College, City Hall, Doctors Medical Center, and the San Pablo Lytton Casino. (Dyett& Bhatia, 2011)** | **Crosses pipeline alignment** | **Uncertain** |
| **RSP-25** | **San Pablo** | **Replace San Pablo Avenue walkway** | **City of San Pablo** | **Replace existing walkway on the existing San Pablo Avenue bridge over San Pablo Creek to raise it to street level. (San Pablo, 2013)** | **Coincides with pipeline alignment** | **Uncertain** |
| **RSP-26** | **San Pablo** | **Undergrounding Utilities on 23rdStreet** | **City of San Pablo** | **Underground utilities on 23rd Street between Market Street and Costa Street. (San Pablo, 2013)** | **Coincides with pipeline alignment** | **After 2016** |

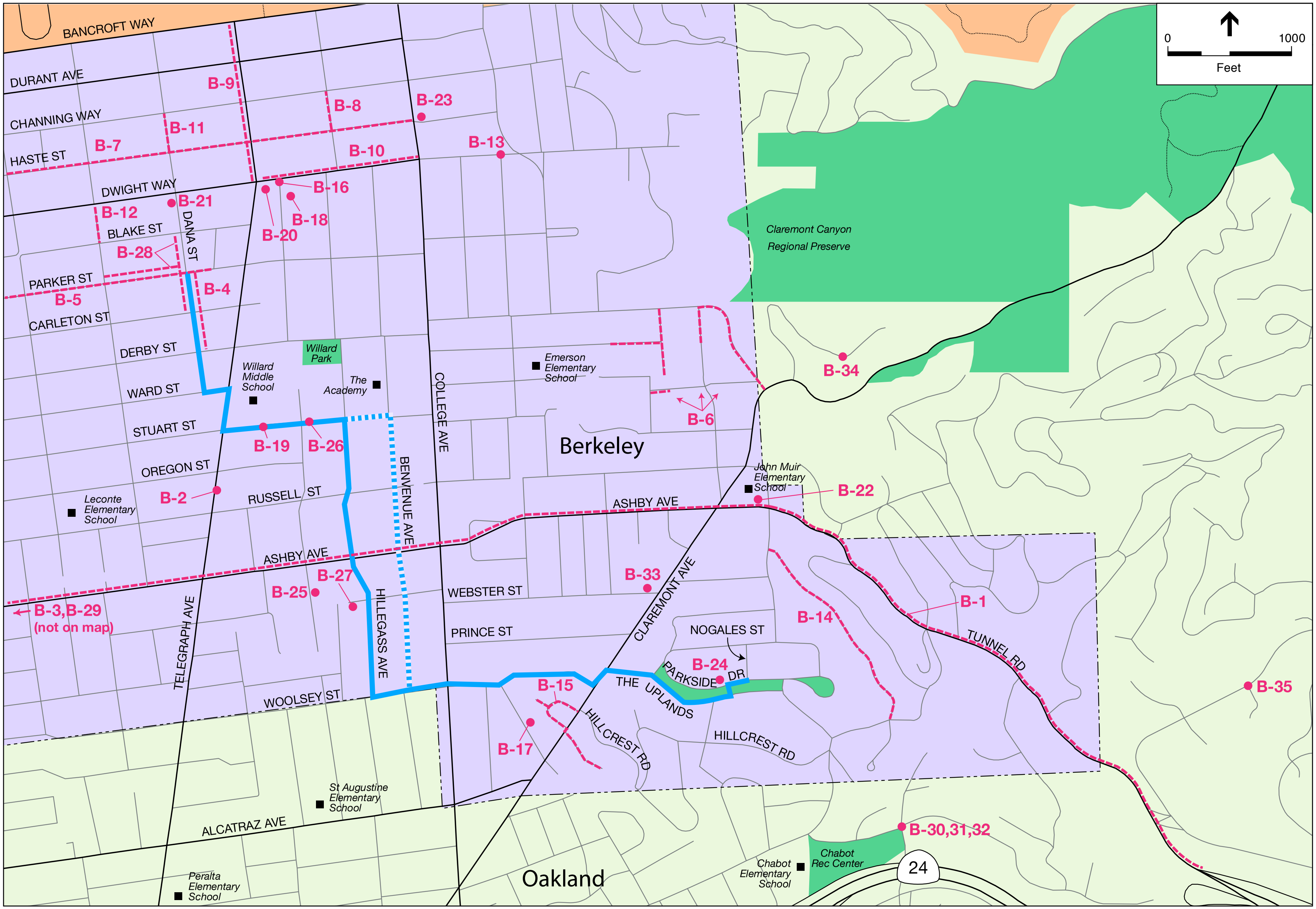
**TABLE 5-1 (Continued)**
**PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS**

| Cumulative Project No. | Jurisdiction | Project Name | Project Sponsor(s) | Project Description | Proximity to Project Area | Estimated Construction Schedule / Status |
|---|---|---|---|---|---|---|
| **Central Pressure Zone (Richmond/San Pablo) 2021 (cont.)** | | | | | | |
| **RSP-27** | **San Pablo** | **Culverted Crossing of Wild Cat Creek at San Pablo Avenue** | **City of San Pablo** | **Construct a culverted crossing of Wildcat Creek at 23rd Street. (San Pablo, 2013)** | **Coincides with pipeline alignment** | **After 2016** |
| RSP-28 | San Pablo | Church Lane Bridge | City of San Pablo | Widen the Church Lane bridge at San Pablo Creek. (San Pablo, 2013) | More than 1,500 feet from pipeline alignment, crosses San Pablo Creek | After 2016 |
| No number | Richmond | Capacity Expansion Projects | City of Richmond | Various capacity expansion, rehabilitation, and replacement projects at the water pollution control plant for Richmond Sanitary District No. 1. (Carollo, 2010) | Greater than ½ mile | 2015-2030 |
| No number | Richmond | Sewer Rehabilitation and Replacement Projects | City of Richmond | Various stormwater inflow abatement projects to eliminate stormwater and tidal inflows to the southern portion of the sewer system. Various sewer rehabilitation and replacement projects to replace sewer pipelines with structural defects. (West Yost Associates, 2011) | Varies | FY 2011/12 – FY 2020/21 |
| **EBMUD Capital Improvement Program – All Pipeline Alignments** | | | | | | |
| No number | Various | Pipeline Infrastructure Renewals | EBMUD | Ongoing replacement of a minimum of approximately 8 miles per year of deteriorating water distribution pipelines. (EBMUD, 2011b) | Varies | FY2012 – FY2016 |
| No number | Various | Pipeline Relocation Programs | EBMUD | Ongoing relocation of pipelines to accommodate projects of other agencies such as roadway improvements, bridge replacements, or rail system expansions. This work is discretionary and typically cannot be forecasted accurately because it is dependent on the schedule of other agencies. (EBMUD, 2011b) | Varies | FY2012 – FY2016 |
| No number | Various | Small Capital Improvements | EBMUD | Construction of small, urgent capital improvements to pumping plants, reservoirs, regulators, and rate control stations. (EBMUD, 2011b) | Varies | FY2012 – FY2016 |
| No number | Various | Pipeline/ Appurtenances | EBMUD | Replace distribution system isolation valves, blow-off assemblies, air valves, and other appurtenances that have reached the end of their useful life or no longer meet current installation practices. (EBUM, 2011b) | Varies | FY2012 – FY2016 |
| No number | Various | Pipeline/ Appurtenances Program | EBMUD | Construct 900 new service installations per year and replace approximately 700 existing services per year (EBMUD, 2011b) | Varies | FY2012 – FY2016 |

**TABLE 5-1 (Continued)**
**PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS**

| Cumulative Project No. | Jurisdiction | Project Name | Project Sponsor(s) | Project Description | Proximity to Project Area | Estimated Construction Schedule / Status |
|---|---|---|---|---|---|---|
| **EBMUD Capital Improvement Program – All Pipeline Alignments (cont.)** | | | | | | |
| No number | Various | Pipeline Extensions Program | EBMUD | Design and construct 5 to 6 miles per year of major pipeline extensions in six East Bay communities, including Berkeley and Richmond. Pipeline extensions are conducted by both EBMUD and applicants to serve new customers. (EBMUD, 2011b) | Varies | FY2012 – FY2016 |
| No number | Various | Rate Control Station Rehabilitations | EBMUD | Rehabilitate or replace deteriorated and unreliable rate control stations in the EBMUD distribution system. (EBMUD, 2011b) | Varies | FY2012 – FY2016 |
| No number | Various | Regulator Rehabilitation Program | EBMUD | Rehabilitate or replace deteriorated and unreliable regulators in the EBMUD distribution system. (EBMUD, 2011b) | Varies | FY2012 – FY2016 |
| No number | Various | Polybutylene Lateral Replacement Program | EBMUD | Replace defective polybutylene service laterals on an ongoing basis. The program includes emergency and pre-emptive (planned) replacement of polybutylene laterals in areas suffering high failure rates as well as incidental replacements when laterals are uncovered during the course of other pipeline repair work. (EBMUD, 2011b) | Varies | FY2012 – FY2016 |
| **Regional Roadway Improvement Projects – All Pipeline Alignments** | | | | | | |
| Reg-1 | Regional | I-80 Integrated Corridor Mobility | Alameda County Transportation Commission and Contra Costa Transportation Authority | Integrate the transportation management systems of the I-80 corridor and San Pablo Avenue Corridor in Alameda and Contra Costa Counties. The project includes improvements to San Pablo Avenue and arterials connecting with the mainline I-80. The projects that will still be in progress in 2014 include software and systems integration, specialty materials procurement, and active traffic management. (ACTC, 2012b) | Occurs along I-80 which would be used by construction-related traffic | 2012-2015 |
| Reg-2 | Regional | Caldecott Tunnel Fourth Bore | Contra Costa Transportation Authority | Improve mobility for motorists and emergency crews along State Route 24 by constructing a fourth bore of the Caldecott Tunnel to allow four full lanes of traffic in each direction at all times. The tunnel is expected to be open by 2013, but the project will not be completed until 2014. (CCTA, 2011) | Occurs on State Route 24 which would be used by construction-related traffic | Current - 2014 |
| Reg-3 | Regional | I-80 HOV Lanes | Caltrans | Construct high occupancy vehicle lane on eastbound I-80 from Willow Avenue, north to the Crockett interchange. Construct high occupancy vehicle lane on westbound I-80 from south of Willow Avenue south to Cummings Skyway. (CCTA, 2009) | Occurs along I-80 which would be used by construction-related traffic | Uncertain |

NOTE: **Bold** indicates project that is within or crossed one of the West of Hills pipeline alignments




See Table 5-1 for a description of projects shown

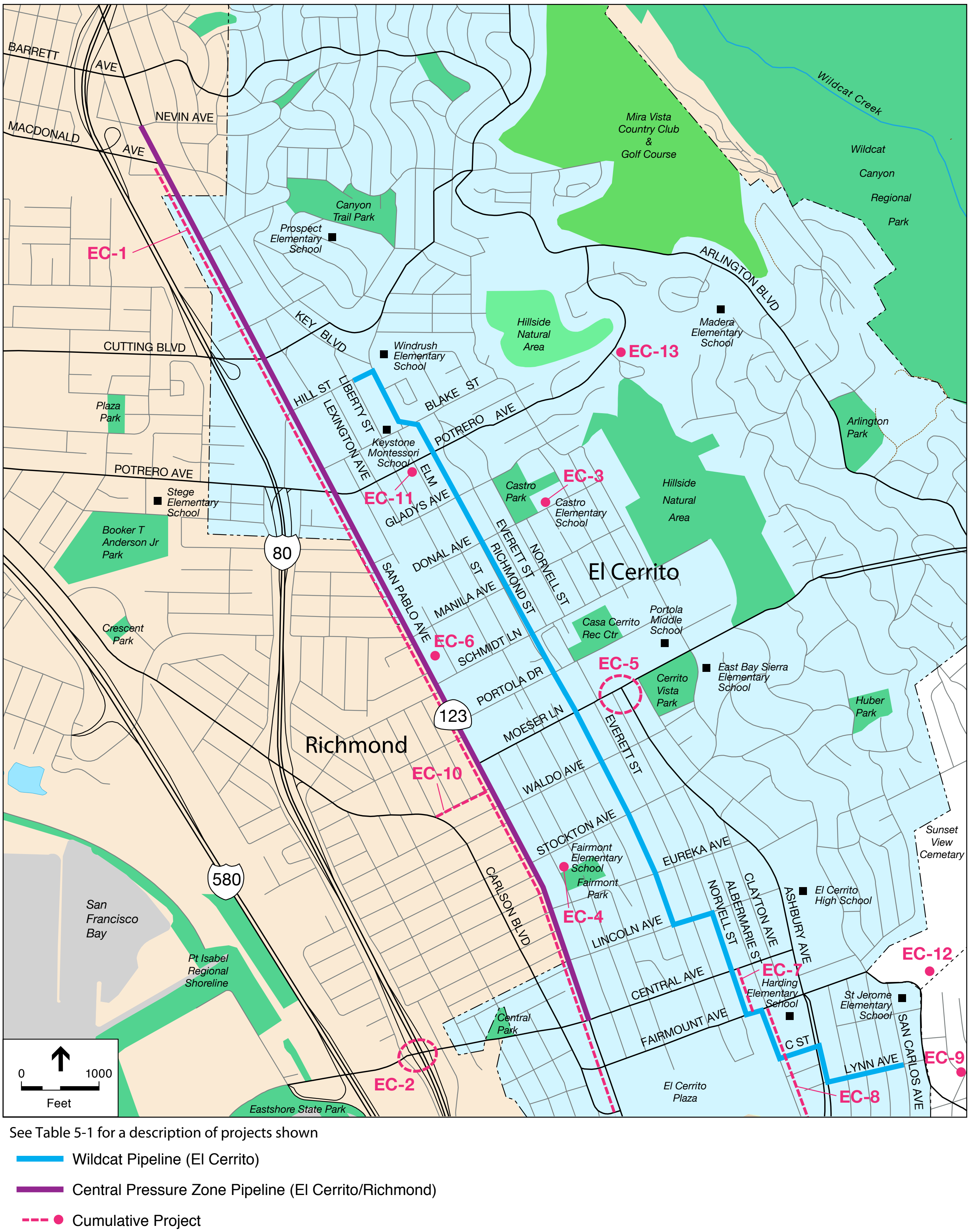
Wildcat Pipeline (Berkeley)
Alternative Alignment (Benvenue Ave)
Cumulative Project

SOURCE: ESA

EBMUD West of Hills Northern Pipelines . 211488

**Figure 5-1**

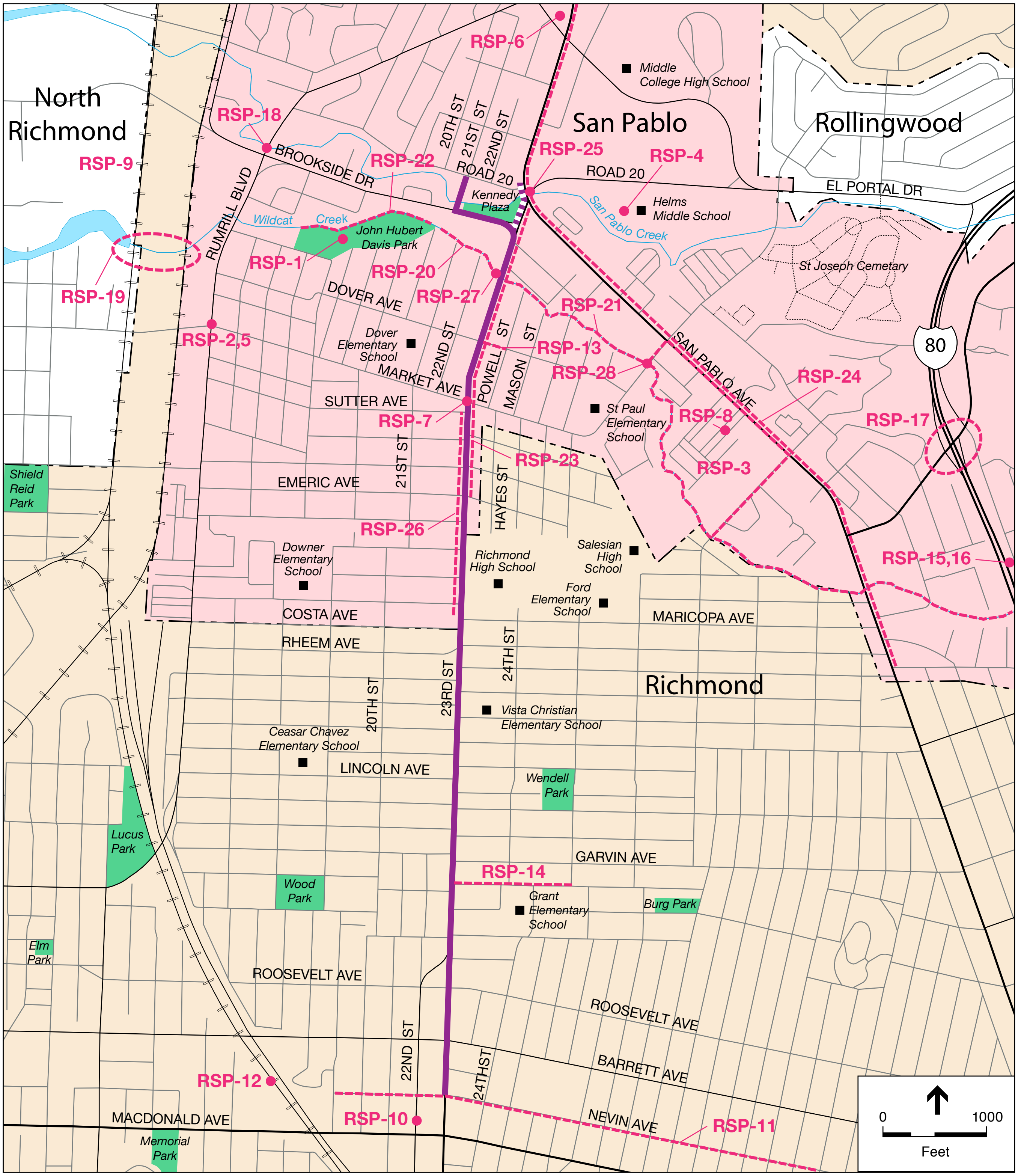
Cumulative Project - Wildcat Pipeline (Berkeley)




EBMUD West of Hills Northern Pipelines . 211488

SOURCE: ESA

**Figure 5-2**
Cumulative Projects - Wildcat Pipeline (El Cerrito) and Central Pressure Zone Pipeline (El Cerrito/Richmond)




See Table 5-1 for a description of projects shown

Central Pressure Zone Pipeline (Richmond/San Pablo)

Alternative Alignment

Cumulative Project



SOURCE: ESA

**Figure 5-3**
Cumulative Projects - Central Pressure Zone Pipeline (Richmond/San Pablo)

## 5.2 Projects Considered in Cumulative Analysis

Table 5-1 lists the past, present, and reasonably foreseeable projects and activities within and near the project area and provides a brief description of the projects and their expected schedule. Those projects listed in Table 5-1 include projects proposed by EBMUD and other parties that could potentially contribute to cumulative impacts when considered together with the proposed project. Information regarding projects proposed by other parties was obtained from published CEQA documents as well as proposed development information obtained from the Cities of Berkeley, El Cerrito, Richmond, and San Pablo.

The EBMUD Capital Improvement Program includes construction of numerous projects in the EBMUD service area to maintain and improve the water system and prioritizes those between fiscal years 2012 and 2016 (EBMUD, 2011b). The identified priorities are categorized into nine water system and three wastewater system strategies (discussed further below). While all of the EBMUD projects identified in Table 5-1 would be conducted under the Capital Improvement Program, many of the improvements such as pipeline installation, repairs, and relocations as well as construction of small capital improvement projects and upgrades to the water distribution system are not specifically scheduled, and could occur at one more location between 2012 and 2016.

Improvements under Extensions and Improvements to the System Strategy include upgrading or replacing reservoirs, pumping plants, and transmission systems to increase storage capacity and improve water quality in EBMUD’s 123 pressure zones (EBMUD, 2011b). The Water Supply Strategy helps EBMUD meet its objective to ensure a reliable, high quality water supply for the future; the Water Recycling Program under this strategy includes provision of recycled water to portions of Albany, Berkeley, Emeryville, and Oakland. Improvements under the Maintaining the Infrastructure Strategy include preventative and corrective maintenance projects to maintain and improve the infrastructure to ensure delivery of reliable, high quality water service. The following activities are planned under this strategy:

- Construct 900 new service installations per year and replace approximately 700 existing services per year under the Pipelines/Appurtenances Program.
- Design and construct 5 to 6 miles per year of major pipeline extensions in six East Bay communities, including Berkeley and Richmond, under the Pipeline Extensions project. Pipeline extensions are conducted by both EBMUD and applicants.
- Replace 7 to 8 miles per year of deteriorating water distribution pipelines under the Pipeline Infrastructure Renewal Project.
- Construct five projects to replace large pipes that form the primary structure or backbone of the distribution system under the Large Diameter Pipelines Project.
- Replace defective polybutylene service laterals on an ongoing basis under the Polybutylene Lateral Replacement Program. The program includes emergency and pre-emptive (planned) replacement of polybutylene laterals in areas suffering high failure rates as well as incidental replacements when laterals are uncovered during the course of other pipeline repair work.

- Rehabilitate and maintain EBMUD's 80 steel and 58 reinforced concrete distribution tanks under the Reservoir Rehabilitation Program. Three steel tanks will be rehabilitated per year, and the concrete tanks will be rehabilitated in accordance with EBMUD priorities.

The Maintaining the Infrastructure Strategy for the wastewater system strategy also includes construction projects at the Main Wastewater Treatment Plant in Oakland and remote wastewater facilities. Remote projects include the Interceptor Rehabilitation Program to improve portions of the existing EBMUD interceptor system and improvements to several pump stations.

# 5.3 Cumulative Impact Analysis

## 5.3.1 Aesthetics

### Impact C-1: Cumulative Impacts to Scenic Vistas and Visual Character.

The geographic scope of potential cumulative impacts on aesthetic resources encompasses the pipeline alignments and immediately adjacent areas. The proposed project, as well as other projects listed in Table 5-1, would result in a significant cumulative impact on scenic resources and the visual character of the area if the proposed project and potentially cumulative projects adversely affect the same scenic resources or views from the same public streets.

#### Short-Term Visual Effects

As discussed in Impact 3.2-1, pipeline construction under the proposed project would occur within urban/developed (residential and commercial) areas for the most part, and construction activities would only be visible for short periods of time (generally about two weeks) in specific locations. While some of the projects in the vicinity of the pipeline alignments, listed in Table 5-1, could potentially result in a significant impact related to aesthetics during construction, the project's contribution to this cumulative impact would not be cumulatively considerable *(less than significant*) because of the short duration that construction activities would be visible.

#### Temporary Construction-Related Sources of Light and Glare

The proposed project may require one day of 24-hour construction for the each tie-ins at the ends of each pipeline (see Impact 3.2-2). Because this nighttime construction would require the use of lighting that could be visible from adjacent residences and roadways, cumulative impacts related to new sources of light and glare would be potentially significant and the project's contribution could be cumulatively considerable.

However, EBMUD would implement Mitigation Measure AES-1 to ensure that stationary lighting used during nighttime construction (if required) is of limited duration, shielded and directed downward or oriented such that little or no light source is directly visible from residential areas. With implementation of this mitigation measure, the project's contribution to cumulative impacts related to new sources of light and glare would be not be cumulatively considerable (*less than significant*).

### Visual Effects of Tree Removal

As discussed in Impact 3.2-3, the proposed project would involve the removal of two trees within the park strip between The Uplands and Parkside Drive. Although mature and native trees would be avoided to the extent possible, tree removal would be noticeable from adjacent locations. However, none of the projects listed in Table 5-1 would involve construction or tree removal within this park strip or in adjacent areas. Therefore, there would be no cumulative impact related to visual effects of tree removal at this location.

Tree removal would also be required where the Central Pressure Zone Pipeline (Richmond/San Pablo) crosses San Pablo Creek, regardless of whether the EBMUD utility corridor or San Pablo Avenue option is used. If any of the potentially cumulative projects listed in Table 5-1 also included tree removal in this area (such as the Wildcat Creek Trail, projects RSP-20 and 21), the cumulative visual impacts of tree removal could be potentially significant and the project's contribution could be cumulatively considerable. However, EBMUD would implement Mitigation Measure BIO-1d requiring preparation and implementation of a vegetation restoration plan to provide mitigation for tree removal which would restore the visual character of the area affected by tree removal. With implementation of this mitigation measure, the project's contribution to cumulative visual effects of tree removal would not be cumulatively considerable (*less than significant*).

### Permanent Effects on Visual Character

As discussed in Impact 3.2-4, the proposed pipe bridge across San Pablo Creek for the Central Pressure Zone Pipeline (Richmond/San Pablo) could be visible from adjacent areas. If any of the projects listed in Table 5-1 also affected views from the same adjacent areas (such as the Wildcat Creek Trail, projects RSP-20 and 21), cumulative impacts related to permanent effects on the visual character would be potentially significant.

If the EBMUD utility corridor is used for the pipe bridge (the preferred option), the project's contribution to this cumulative impact would not be cumulatively considerable (*less than significant*) because the alignment is located on private property which would restrict public access to the area, making it difficult for the public to view the bridge. Further, vegetation surrounding the location would screen views of the pipe bridge.

If the San Pablo Avenue option is used for the pipe bridge, the deck of the pipe bridge would be approximately 6-inches higher than the deck of the existing San Pablo Avenue bridge and approximately three feet higher than the pedestrian walkway along the west side of San Pablo Bridge. Because of this, the pipe bridge would partially obstruct views of San Pablo Creek and the adjacent vegetated banks. The City of San Pablo is considering replacing the existing walkway to raise it to street level which would lessen the severity of this impact, especially if the pipeline could be constructed beneath the walkway. However, there is uncertainty in coordinating these two projects and the project's impact related to permanent effects on visual character, as well as the project's contribution to this cumulative impact, is considered *significant and unavoidable*.

## 5.3.2 Air Quality

**Impact C-2: Cumulative Air Quality Impacts.**

The geographic scope of potential cumulative impacts on air quality encompasses the pipeline alignments and immediately adjacent areas as well as the San Francisco Bay Area Air Basin (SFBAAB) in general. To address cumulative impacts on regional air quality, the Bay Area Air Quality Management District (BAAQMD) has established thresholds of significance for construction-related and operational criteria pollutant emissions. These thresholds represent the levels at which a project's individual emissions of criteria pollutants and precursors would result in a cumulatively considerable contribution to the region's existing air quality conditions. If a project's emissions exceed these thresholds, the project would result in a cumulatively considerable contribution, a significant cumulative impact.

As discussed in Section 3.3, Air Quality, Impact 3.3-1 construction emissions of NOx from the Wildcat Pipelines (Berkeley and El Cerrito), could exceed the BAAQMD threshold of 54 pounds per day if both pipelines were constructed at the same time. Therefore, the project could have a cumulatively considerable contribution to emissions of NOx, a criteria air pollutant during construction if done simultaneously. However, EBMUD would implement Mitigation Measure AIR-1b requiring the construction contractor to use a truck fleet with an average model year of 2010 or newer if Wildcat Pipeline (Berkeley) and Wildcat Pipeline (El Cerrito) are to be constructed at the same time, With implementation of this mitigation measure, NOx emissions would be reduced to a less-than-significant level and the project's contribution to NOx emissions would not have a cumulatively considerable contribution to the region's existing air quality conditions. Construction emissions of NOx from the Central Pressure Zone Pipelines (El Cerrito/Richmond and Richmond/San Pablo), would not exceed the BAAQMD threshold of 54 pounds per day and no other criteria pollutant emissions would exceed applicable BAAQMD thresholds. Therefore the proposed project would not have a cumulatively considerable contribution to the region's existing air quality conditions.

The BAAQMD's CEQA Guidelines also require evaluation of the project's contribution to cumulative toxic air contaminant (TAC) exposure of sensitive receptors in the project vicinity by considering all TAC permitted stationary and mobile sources within 1,000 feet of the project site. In accordance with these guidelines, cumulative emissions of TACs would be significant if cumulative diesel particulate matter (DPM) emissions exceeded BAAQMD's risk and hazard thresholds of 100 excess cancer cases in a million, a Hazard Index (chronic and acute non-cancer risks) of 10, or annual average PM2.5 concentrations of 0.8 micrograms per cubic meter (μg/m3).

As discussed in Impact 3.3-2, the project-related use of diesel fuels in construction equipment would generated DPM emissions that could result in an excess cancer risk of 5.76 in a million for children age 0 to 2 and a non-cancer hazard index of 0.027. The maximum annual DPM concentration would be 0.1348 μg/m3. When combined with emissions from the two local stationary sources and nearby roadways (23rd Avenue and San Pablo Avenue), the cumulative excess cancer risk would be 7.93 in a million for children age 0 to 2 and a non-cancer hazard index of less than 0.067. The maximum annual DPM concentration would be 0.216 μg/m3. All of these values are well below the above-stated BAAQMD thresholds of significance for cumulative impacts.

Cumulative projects identified in Table 5-1 that could overlap with the project location are as follows:

- The City of Berkeley has two planned sewer replacement projects located within 1,000 feet of the proposed Wildcat Pipeline (Berkeley) alignment (Projects B-4 and B-5, scheduled for 2014).
- Two private construction projects are planned along the Wildcat Pipeline (Berkeley) alignment (Projects B-19 and B-26).
- EBMUD has two water pipeline replacement projects in El Cerrito that would overlap or be located adjacent to the Wildcat Pipeline (El Cerrito) alignment (Projects EC-6 and EC-7) and one pipeline replacement project that would be adjacent to the Central Pressure Zone Pipeline (El Cerrito/Richmond) alignment (Project EC-9). Streetscape improvements along San Pablo Avenue are also planned by the City of El Cerrito, and this project could overlap with the Central Pressure Zone (El Cerrito/Richmond) pipeline alignment in 2021.
- The City of San Pablo plans to construct paved trails along Wildcat Creek and a city park in proximity to the location that the Central Pressure Zone Pipeline (Richmond/San Pablo) jack-and-bore crossing over Wildcat Creek and the bridge crossing over San Pablo Creek would be constructed (Projects RSP-20 and RSP-21, no schedule).
- The City of San Pablo will implement the 23rd Street Specific Plan (no schedule), which overlaps with the Central Pressure Zone Pipeline (Richmond/San Pablo) alignment and San Pablo Avenue Specific Plan (no schedule) that crosses the same pipeline alignment.

These projects could overlap with or be located adjacent to proposed alignment locations and would be located within 1,000 feet of the pipeline alignments. However, each cumulative project is in a different location and would affect different receptors. Therefore, even if one of the cumulative projects generated construction emissions similar to estimated project emissions, and occurred at the same time and in the same place as the proposed Project (essentially doubling project emissions listed in Table 3.3-5), cumulative emissions would still be well below BAAQMD's cumulative risk and hazard thresholds. Therefore, the project's contribution to cumulative risk and hazard impacts would not be cumulatively considerable (*less than significant*).

As discussed in Impact 3.3-4, the only criteria pollutant emissions associated with operation of the project would result from maintenance traffic, and would remain similar to those associated with existing maintenance activities. There would be negligible TAC or DPM emissions associated with this traffic. Therefore, there would be no operational risk and hazard impacts associated with operation of the project, and the project would not have a cumulatively considerable contribution to the region's existing air quality conditions as a result of project operation.

## 5.3.3 Biological Resources

### Impact C-3: Cumulative Impacts on Biological Resources.

The geographic scope for the discussion of cumulative impacts on biological resources is the four-city area in which the project is located—Berkeley, El Cerrito, Richmond, and San Pablo. The vast majority of this area is characterized as thoroughly urbanized, with little remaining of natural vegetation, wildlife habitat, and riparian systems. Most of the proposed project would pass through residential and commercial areas where project activity would have little to no effect on biological resources. Likewise, project operation would have negligible effect on biological resources.

The principal impact of the proposed project on biological resources is associated with discharges to creeks and the removal of several large, mature trees in the San Pablo Creek streambank and the associated loss of habitat for wildlife. Therefore the cumulative impact analysis focuses on impacts associated with these activities.

#### Impacts on Special-Status Species, Aquatic Resources, and Resident Trout and other Native Fishes

As discussed in Impact 3.4-2, the proposed project could result in adverse impacts on California red-legged frog (CRLF), steelhead trout, and western pond turtle because of the potential for erosion and sedimentation or hazardous materials spills during construction of the pipe bridge footings at San Pablo Creek and jack and bore activities at Wildcat Creek as part of the Central Pressure Zone Pipeline (Richmond/San Pablo). In addition, as described in Impact 3.4-3, construction of the pipeline crossing over San Pablo Creek could result in erosion and sedimentation in the San Pablo Creek channel. Construction at all creek crossings would have the potential to impede movement of resident trout and other native fishes during construction as a result of direct discharges that could degrade aquatic habitat (see Impact 3.4-4).

Many of the projects listed in Table 5-1 would involve excavation of soil or discharges of stormwater or groundwater and could affect the same creek crossings. In addition, several projects, such as the Davis Park Master Plan projects (Project RSP-1), Wildcat Creek Trail (RSP-20 and 21), San Pablo Creek Daylighting (RSP-22), Helms Community Center (Project RSP-4), Rumrill Bridge Replacement (RSP-18), and Wildcat Creek Regional Trail: Construct Bridge over railroads (RSP-19) would be constructed within or near Wildcat Creek or San Pablo Creek, and could result in sedimentation of or a release of hazardous materials to these sediment-sensitive water bodies. Therefore cumulative impacts related to these species would be potentially significant and the project's contribution could be cumulatively considerable, particularly if excavation occurred during the rainy season. Compliance with the Construction General Stormwater Permit (including preparation of a SWPPP) and Contra Costa County Flood Control and Water Conservation District requirements for construction near Wildcat Creek and San Pablo Creek as well as implementation of Mitigation Measure HYD-1 (Schedule Construction Activities at Harwood Creek, Wildcat Creek, and San Pablo Creek During the Dry Season) would reduce the potential for project-related sedimentation of receiving water by requiring contractors to implement best management practices for the control of erosion and sediment, and to schedule construction activities at these locations during the dry season. Implementation of these requirements would ensure that the project's contribution to this cumulative impact is not cumulatively considerable (*less than significant*).

Project implementation also has the potential to adversely affect special-status birds and other wildlife, including bats, through direct removal of riparian trees (see Impact 3.4-2). Many of the cumulative projects listed in Table 5-1 could affect the same sensitive species. This is a potentially significant cumulative impact and the project's contribution could be cumulatively considerable. However, project-specific impacts on special-status species would occur during construction only, and implementation of the following mitigation measures would ensure that construction activities do not result in the permanent loss of habitat or direct mortality for any of the special-status species present: BIO-1a, General Protection Measures; BIO-1b, Riparian Protection Measures; BIO-1c, Carry Out Preconstruction Surveys near Riparian Habitats; and BIO-1d, Prepare and Implement a Vegetation Restoration Plan and Compensatory Mitigation for Riparian Habitats. With implementation of these mitigation measures, the project's contribution to this impact would not be cumulatively considerable (*less than significant*).

#### Conflicts with Local Policies and Ordinances

As discussed in Impact 3.4-6, the proposed project could conflict with local policies or ordinances protecting biological resources because project construction would require the removal of up to two trees at Upland Park and tree removal at the San Pablo Creek crossing. Many of the projects listed in Table 5-1 would also remove protected trees, and cumulative impacts related to conflicts with local policies and ordinances could be potentially significant. However, EBMUD would implement AES -2 and BIO-1d which require replacement of trees and other measures that would ensure compliance with applicable local policies. With implementation of these measures, the project's contribution to this cumulative impact would not be cumulatively considerable (*less than significant*).

## 5.3.4 Cultural Resources

### Impact C-4: Cumulative Impacts on Historical, Archaeological, and Paleontological Resources.

The geographic scope for cumulative impacts to cultural resources includes a one-mile radius from the proposed pipeline alignments. This geographic scope of analysis is appropriate because the archaeological, historical, and paleontological resources within this radius are expected to be similar to those in the project area because of their proximity; similar environments, landforms, and hydrology would result in similar land-use—and thus, site types. Similar geology within this vicinity would likely yield fossils of similar sensitivity and quantity.

The project area contains a significant archaeological and historical record that, in many cases, has not been well documented or recorded and the project could result in significant impacts to these resources as a result of project-related excavation (see Impacts 3.5-1 and 3.5-2). Because many of the projects listed in Table 5-1 could also disturb the same known or unknown archaeological and historic resources as a result of excavation, cumulative impacts on archaeological and historic resources would be potentially significant, and the project's contribution would be cumulatively considerable. However, this EIR includes Mitigation Measures CUL-1a (Retain a Qualified Archaeologist), CUL-1b (Develop and Archaeological Research Design and Treatment Plan), and CUL-1c (Inadvertent Discovery of Cultural Resources) to reduce potential project impacts to archaeological and historical resources during construction of the proposed project. With implementation of these measures, the proposed project would not have a cumulatively considerable contribution to cumulative impacts to archaeological and historical resources (*less than significant*).

Excavation activities associated with the proposed project could contribute to the progressive loss of fossil remains, as-yet unrecorded fossil sites, associated geological and geographic data, and fossil bearing strata and human remains could be encountered during excavation (see Impacts 3.5-3 and 3.5-4). Because many of the projects listed in Table 5-1 could also disturb paleontological resources or human in the project vicinity as a result of excavation, cumulative impacts on paleontological resources and human remains would be potentially significant, and the project's contribution would be cumulatively considerable. However, the project's contribution would not be cumulatively considerable with the implementation of regulatory requirements and the mitigation measures specified in this EIR, including Mitigation Measures CUL-2a (Paleontological Resources Mitigation Plan), CUL-2b (Paleontological Resources Training), CUL-2c (Assessment and Salvage of Potential Fossil Finds, CUL-2d (Monitoring by a Qualified Paleontologist during Ground Disturbing Activities, and CUL-3 (Inadvertent Discovery of Human Remains).

## 5.3.5 Energy Conservation

### Impact C-5: Cumulative Impacts Related to Energy Consumption and Conservation.

The geographic scope for cumulative energy consumption and conservation impacts is the local electricity distribution grid for peak period electricity consumption, the service area of PG&E for overall electricity consumption, and the San Francisco Bay Area and state for consumption of petroleum fuels.

#### Fuel Consumption During Project Construction

As described in Section 3.6, Energy Conservation, Impact 3.6-1, construction would require a typical amount of fuel for vehicles and construction equipment, and construction-related fuel consumption would be temporary in nature and limited to the construction duration of each pipeline project (up to 12 months per pipeline). As described under Impact 3.6-2, construction would not have a significant impact on local and regional energy supplies or on requirements for additional capacity. Other projects whose construction periods would overlap with that of the proposed project are not anticipated to have a significant effect on local or regional energy supplies because vehicles used would be subject to the same fuel economy standards as those used for the proposed project. Therefore, cumulative impacts related to energy consumption during construction would be *less than significant*.

### Energy Consumption During Project Operation

As described under Impact 3.6-1, the proposed project would improve the efficiency of pumping plants serving the West of Hills area, improve the ability of EBMUD to shift electricity use to off-peak hours, and extend the useful life of existing EBMUD facilities, the project is expected to have a beneficial impact on energy conservation. Therefore, the project would have a beneficial impact related to energy consumption, and would not contribute to cumulative impacts related to consumption of energy.

## 5.3.6 Geology and Soils

### Impact C-6: Cumulative Impacts Related to Seismic Hazards, Soil Erosion and Topsoil, Unstable Geologic Units, and Expansive Soils, and Changes to Topography.

The geographic scope of potential cumulative impacts related to geology, seismicity, and soils encompasses the pipeline alignments and immediate vicinities. Although many of the cumulative projects listed in Table 5-1 could have similar geologic impacts to the proposed project, geologic, and soils impacts are generally site-specific and depend on local geologic and soil conditions.

#### Seismic Impacts

As discussed in Impacts 3.7-2 and 3, the Central Pressure Zone Pipeline (Richmond/San Pablo) could be subject to liquefaction and strong groundshaking where the pipeline crosses San Pablo Creek. Many of the potentially cumulative projects listed in Table 5-1 could also be subject to these seismic effects, a potentially significant impact because many of the projects would increase the number of people potentially exposed to these hazards. However, the project's contribution to this impact would not be cumulatively considerable because the project does not include habitable structures or otherwise introduce new people to the project area.

#### Loss of Topsoil and Expansive Soil

As discussed in Impact 3.7-1, construction of the pipe bridge at the north end of the Central Pressure Zone Pipeline (Richmond/San Pablo) and the adjacent Kennedy Park could result in the loss of top soil. Many of the projects listed in Table 5-1 would also have the potential to result in a loss of topsoil, particularly those projects constructed adjacent to San Pablo or Wildcat Creek, including the Davis Street Master Plan (RSP-1), construction of the Wildcat Creek Trail (RSP-24 and RSP-25), and San Pablo Creek Daylighting (RSP-26), Rumrill Bridge Replacement (RSP-22), and Wildcat Creek Regional Trail: Construct Bridge over railroads (RSP-23). Therefore, cumulative impacts related to loss of topsoil are potentially significant and the project's contribution would be cumulatively considerable. However, as described in Section 3.7, Geology and Soils, EBMUD would implement Mitigation Measure GEO-2 (Replacement of Topsoil at San Pablo Creek Crossing) requiring the contractor to segregate top soil and replace the topsoil at the completion of construction. Implementation of this measure would ensure that the project's contribution to cumulative impacts related to loss of top soil would not be cumulatively considerable and would be *less than significant*.

The project would be designed to withstand expansive soils. Therefore, the cumulative impact associated with expansive soils would be *less than significant*.

### Unstable Geologic Unit

As discussed in Impact 3.7-6, the Central Pressure Zone Pipeline (Richmond/San Pablo) alignment crosses an area of high to very high liquefaction susceptibility associated with the modern stream channel deposits and Latest Holocene-age alluvial fan levee and stream terrace deposits at Wildcat and San Pablo Creeks. Operation of continuous vibratory equipment, such as compactors or sheet pile drivers, could induce liquefaction and related differential settlement in this area, depending on the type, magnitude, and duration of vibration. While this would be a potentially significant impact of the project, none of the projects listed in Table 5-1 would involve pile driving or other substantial vibration-inducing activities in close proximity to this area. In addition, the proposed project's impact would be reduced to a less-than-significant level with implementation of Mitigation Measure NOI-4 (Vibration Limits), which requires implementation of vibration limits to prevent vibration-induced liquefaction. Therefore, cumulative impacts related to differential settlement as a result of construction-related vibration would be *less than significant*.

## 5.3.7 Greenhouse Gas Emissions

### Impact C-7: Cumulative Impacts Related to GHG Emissions.

The accumulation of GHGs has been implicated as a driving force for global climate change, a term that is used interchangeably with "global warming" and the "greenhouse effect." Because GHG emissions affect global climate change, the evaluation of GHG emissions is inherently a cumulative impact issue. However, it is not feasible to evaluate GHG emissions impacts based on the sum of all past, present, and reasonably foreseeable future projects on a global scale, therefore the geographic scope for cumulative GHG emission impacts is the San Francisco Bay Area Air Basin as well as the state as a whole.

### GHG Emissions during Project Construction

Construction of the project in combination with other projects in the region, including those listed in Table 5-1, would contribute to regionwide cumulative increases in emissions of GHGs, a significant cumulative impact. As discussed in Impact 3.8-1, it is estimated that pipeline construction would generate up to 505 MT of CO2e in the peak year (2021). Total GHG emissions from pipeline construction calculated over a minimum 30-year expected lifespan of the project would be approximately 28 MT of CO2e per year. Because BAAQMD does not have a threshold of significance for construction-related GHG emissions, the project's estimated emissions are compared to statewide and Bay Area annual GHG emissions. The project's construction emissions would represent approximately 0.00018 percent of total annual GHG emissions for the state,1 and approximately 0.009 percent of total annual GHG emissions for the entire Bay Area.[2] Thus, while

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[1] CARB (2011) reported net statewide GHG emissions in 2009 at approximately 453 MMT $CO_2$e.

[2] BAAQMD (2010) reported regional Bay Area GHGs emissions in 2007 at approximately 95.8 MMT $CO_2$e.

the cumulative impact of regional and statewide GHG emissions is potentially significant, the contribution of GHG emissions from the project would be extremely small in terms of both the statewide and Bay Area annual GHG emissions. In addition, construction-related GHG emissions would be temporary in nature and limited to the construction duration of each pipeline project (up to 12 months for each pipeline, as listed in Table 3.8-3). Therefore, the project's contribution to GHG emissions during construction would not be cumulatively considerable and would be *less than significant*.

Although no mitigation is necessary, implementation of Mitigation Measure AIR-1a (BAAQMD Basic Construction Measures), which is prescribed to reduce NOX emissions during construction (see Impact 3.3-1 in Section 3.3, Air Quality), would also serve to reduce GHG emissions during construction. Furthermore, consistent with BAAQMD-recommended BMPs for reducing GHG emissions during construction, EBMUD proposes to use excavated material as backfill where feasible, thereby minimizing GHG emissions associated with construction haul trucks and solid waste disposal.

#### GHG Emissions during Project Operations

Given the global nature of the climate change issue, cumulative GHG emissions are considered a significant impact. At the project level, BAAQMD CEQA Guidelines established 10,000 MT of CO2e per year as the individual project operational threshold. Because BAAQMD's threshold of significance for operational GHG emissions represents the level that would not substantially conflict with the goal of reducing statewide GHG emissions, which in turn are aimed at stabilizing global climate change (BAAQMD, 2009), GHG emissions below this threshold are not considered cumulatively considerable. As discussed in Impact 3.8-2, GHG emissions associated with pipeline operation and maintenance would remain similar to existing levels. Therefore, the project's operational GHG emissions would not be cumulatively considerable and would be *less than significant*.

## 5.3.8 Hazards and Hazardous Materials

### Impact C-8: Cumulative Impacts Related to Hazards and Hazardous Materials.

The geographic scope of potential cumulative hazards and hazardous materials impacts encompasses the pipeline alignments and immediately adjacent areas. These types of impacts are generally site specific and depend on past, present, and future industrial uses and existing soil, sediment, and groundwater conditions.

#### Hazardous Materials and Naturally Occurring Asbestos

During the excavation and grading phases of construction, the proposed project has the potential to expose people or the environment to hazardous materials encountered in soil or groundwater; these materials may be present in subsurface materials due to spills and leaks in the site vicinity (most commonly related to leaking underground fuel tanks), or due to naturally occurring asbestos that could be present in subsurface rocks along portions of the Wildcat Pipeline (Berkeley) and Central Pressure Zone Pipeline (El Cerrito/Richmond) (see Section 3.9, Hazards and Hazardous Materials, Impacts 3.9-1 and 3.9-4). In addition, accidental spills of small quantities of hazardous materials used during construction (i.e., motor fuels, oils, solvents, lubricants) could also result in exposures (see Impact 3.9-2). Many of the projects listed in Table 5-1 could also encounter hazardous materials in the soil or groundwater, or naturally occurring asbestos during construction, or result in an accidental spill. Therefore, this cumulative impact is potentially significant, and the project's contribution could be cumulatively considerable.

However, the project would be required to adhere to all regulations regarding hazardous materials storage and handling, as well as implement EBMUD Master Specifications and water quality best management practices and controls to minimize and avoid the potential exposure to hazardous materials. Mitigation Measure HAZ-2 (Asbestos Dust Mitigation Plan), requires testing for the presence of naturally occurring asbestos along the Wildcat Pipeline (Berkeley) and Central Pressure Zone Pipeline (El Cerrito/Richmond) and implementation of an asbestos management plan if found. Together, these measures would ensure that the project's contribution to this cumulative impact is not cumulatively considerable (*less than significant*) by ensuring that impacts related to exposure to hazardous materials are minimized and/or avoided.

#### Underground Utilities

During excavation for construction, project activities have the potential to damage utilities resulting in hazards to construction workers, the public and the environment as discussed in Impact 3.9-3. Many of the projects listed in Table 5-1 could also damage underground utilities, including sewer replacement projects planned by the City of Berkeley and other pipeline projects planned by EBMUD. Therefore, cumulative impacts related to damage to utilities would be potentially significant, and the projects contribution could be cumulatively considerable.

However, EBMUD would implement Mitigation Measures HAZ-1a through HAZ-1c, requiring advance coordination with utility providers for protection of the subsurface utilities, protection for utilities during construction, and notification to local fire departments and utility providers regarding any damage to utilities. With implementation of these measures, the project's contribution to this cumulative impact would not be cumulatively considerable (*less than significant*).

#### Hazardous Emissions or Handling of Acutely Hazardous Materials, Substances or Wastes within ¼ Mile of a School

As discussed in Impact C-2, the project would emit DPM, a toxic air contaminant from the use of diesel fuels in construction equipment. Some of these emissions would occur within ¼-mile of a number of schools. However, based on a conservative screening-level analysis (as discussed in Section 3.3, Air Quality), construction emissions of DPM would be less than the BAAQMD thresholds of significance for individual project. A number of projects listed in Table 5-1 could overlap with or be located adjacent to proposed alignment locations and additional projects would be located within 1,000 feet of the pipeline alignments. However, each cumulative project is in a different location and would affect different receptors. Therefore, even if each cumulative project generated construction emissions similar to estimated project emissions (essentially doubling project emissions listed in Table 3.3-5), cumulative emissions would still be well below

BAAQMD's cumulative risk and hazard thresholds of 100 excess cancer cases in a million, Hazard Index of 10 (chronic and acute non-cancer risks), and annual average PM2.5 concentrations of 0.8 µg/m3. Therefore, the project's contribution to this cumulative impact would not be cumulatively considerable (*less than significant*).

### Wildland Fires

The proposed project is not located within a designated high fire hazard area (see Impact 3.9-6). A potentially significant cumulative impact related to increased fire risk could occur because the project and many of the projects listed in Table 5-1 would use of construction equipment and temporarily store diesel fuel and other flammable hazardous materials. However, the project's contribution would not be cumulatively considerable (*less than significant*) with implementation of EBMUD Contract Specification Section 01 35 24 requiring maintenance on site of fire-fighting equipment capable of extinguishing a fire that is in its beginning stage as well as compliance with hazardous materials storage and fire protection regulations and applicable National Fire Prevention Standards for construction operations.

## 5.3.9 Hydrology and Water Quality

### Impact C-9: Cumulative Impacts on Hydrology and Water Quality.

The geographic scope for potential cumulative hydrology and water quality impacts consists of the coastal watersheds affected by the project. The analysis of potential cumulative impacts on hydrology and water quality considers those cumulative projects listed in Table 5-1 and shown in Figure 5-1 that could adversely affect water quality in the same watersheds.

### Degradation of Water Quality

As discussed in Section 3.10, Hydrology and Water Quality, Impact 3.10-1, construction activities associated with the proposed project could contribute to the degradation of water quality from increased soil erosion and associated sedimentation of the storm drain systems in Berkeley, El Cerrito, Richmond, and San Pablo, as well as Harwood Creek, Wildcat Creek, and San Pablo Creek. Both Wildcat Creek and San Pablo Creek are considered sediment-sensitive water bodies because they have the beneficial uses of cold freshwater habitat, fish migration, and fish spawning. An accidental release of hazardous materials could also degrade these water bodies. In addition, discharges of groundwater during trench dewatering and treated water in pipelines could also affect water quality (3.8-2). Many of the projects listed in Table 5-1 would involve excavation of soil or discharges of stormwater or groundwater and could affect the same storm drain systems. In addition, several projects, such as the Davis Park Master Plan projects (Project RSP-1), Wildcat Creek Trail (RSP-24 and 25), San Pablo Creek Daylighting (RSP-26) and Helms Community Center (Project RSP-4), Rumrill Bridge Replacement (RSP-22), and Wildcat Creek Regional Trail: Construct Bridge over railroads (RSP-23) would be constructed within or near Wildcat Creek or San Pablo Creek, and could result in sedimentation of or a release of hazardous materials to these sediment-sensitive water bodies. Therefore cumulative impacts related to water quality degradation would be potentially significant.

Excavation along the proposed Wildcat Pipeline (El Cerrito), Central Pressure Zone Pipeline (El Cerrito/Richmond), northern portion of the Wildcat Pipeline (Berkeley), and southern portion of the Central Pressure Zone Pipeline (Richmond/San Pablo) alignments would occur entirely along public rights-of-way, and construction-related stormwater runoff would discharge to the city storm drain systems that ultimately discharge to San Francisco Bay. For these pipelines, compliance with the Construction General Stormwater Permit (as described in Impact 3.10-1) and EBUMD's Master Specifications (as described in Impact 3.10-2) would ensure that the water quality objectives of the Basin Plan are maintained during construction. Compliance with these requirements would ensure that the project's contribution to cumulative water quality impacts related to degradation of water quality associated with erosion and sedimentation, hazardous materials release, and discharges of groundwater and treated water is not cumulatively considerable (*less than significant*).

However, construction activities within the bank of San Pablo Creek for the pipeline bridge at the northern end of the Central Pressure Zone Pipeline (Richmond/San Pablo) could result in direct discharges to San Pablo Creek. Similarly, excavation for jack and bore pits at the Wildcat Creek crossing would also be conducted near to the creek and within the 100-year flood zone for the creek and could similarly result in direct discharges to Wildcat Creek and construction activities at Harwood Creek would occur within the 100-year flood zone of that creek. Therefore, the project's contribution to this cumulative impact could be cumulatively considerable at these creek crossings, particularly if excavation occurred during the rainy season. Implementation of Mitigation Measure HYD-1, Schedule Construction Activities at Harwood Creek, Wildcat Creek, and San Pablo Creek During the Dry Season, would reduce the potential for project-related sedimentation of these water bodies by requiring contractors to schedule construction activities at these locations during the dry season. Implementation of this mitigation measure would ensure that the project's contribution to this cumulative impact is not cumulatively considerable (*less than significant*).

### Alteration of Drainage Patterns and Impedance or Redirection of Flood Flows

As described in Impact 3.10-3, construction activities associated with the jack and bore crossing beneath Wildcat Creek and the pipeline bridge across San Pablo Creek could result in temporary alteration of drainage patterns or impedance or redirection of flood flows if flooding were to occur during construction at these locations. Several projects listed in Table 5-1 could also have the potential to alter drainage patterns and affect flood flows, including the Davis Park Master Plan project (Project RSP-1) and other potential projects within the flood zones of Wildcat Creek and San Pablo Creek. Therefore, cumulative impacts related to temporary alteration of drainage patterns or impedance or redirection of flood flows are potentially significant and the project's contribution could be cumulatively considerable.

However, as described in Impact 3.10-3, all bridge footings for the pipe bridge at San Pablo Creek would be constructed above the ordinary high water mark and the base flood elevation of San Pablo Creek, and would be appropriately anchored; the creek bed would not be filled or otherwise altered. Further, implementation of Mitigation Measure HYD-1, Schedule Construction Activities at Harwood Creek, Wildcat Creek, and San Pablo Creek During the Dry Season, would require the construction contractor to schedule construction activities at these locations during the dry season when flooding would not occur. Implementation of this measure would ensure that the project's contribution to cumulative impacts associated with alteration of drainage patterns and impedance or redirection of flood flows is not cumulatively considerable (*less than significant*).

## 5.3.10 Noise and Vibration

### Impact C-10: Cumulative Increases in Construction Noise and Vibration in the Vicinity of Proposed Pipelines.

The geographic scope of potential cumulative noise and vibration impacts encompasses the proposed pipeline alignments and their immediate vicinities, as well as areas adjacent to access and construction haul routes.

#### Construction-Related Noise and Vibration

In general, the potential for cumulative construction-related noise and vibration impacts would be specific to each proposed pipeline alignment and would not combine to cause a cumulative impact. Of the many cumulative projects that are planned in the vicinity of proposed pipeline alignments, there are 23 projects that overlap (projects in bold in Table 5-1), cross, or are adjacent to proposed pipeline alignments and some are scheduled to occur during the same years as the proposed pipeline projects. Fifteen of these projects are located adjacent to the proposed pipeline alignments, and the timing of these projects is unknown. Any overlap of these projects could cause cumulative construction-related noise impacts on residential receptors located adjacent to these two sites. If the projects were to proceed and coincide with construction of the proposed Wildcat Pipeline (Berkeley) project, construction hours of these two projects would be subject to time limits specified in the Berkeley Noise Ordinance and no cumulative impact related to conflicts with local ordinances would occur. In addition, since project-related noise increases in the vicinity of these two sites would occur for less than 10 consecutive work days, the project's contribution to potential cumulative noise increases would not be cumulatively considerable (*less than significant*).

The remaining projects are linear projects (sewer or water pipeline replacement, and transit or street improvements), where construction would progress along an alignment similar to the proposed pipeline projects. While it is uncertain whether these cumulative linear projects would occur at the same time and location as the proposed project, there is a potential for overlap. Depending on the degree of overlap, the primary cumulative effect of any overlapping projects would be combined noise and vibration increases at adjacent sensitive receptors, or the sensitive receptors could be subject to construction noise and vibration increases for a longer time. Both of these cumulative effects would be potentially significant and the project's contribution could be cumulatively considerable.

As discussed in Impacts 3.11-2 and 3, noise increases along each of the pipeline routes could exceed the daytime speech interference threshold and vibration limits could also be exceeded. As construction proceeds along the pipeline corridor, residents would be temporarily affected, but not occur for longer than 10 work days or 2 weeks. With implementation of Mitigation Measures NOI-1 (Time Limits, Administrative Controls, and Source Controls), NOI-2 (Additional Attenuation Measures), and NOI-4 (Vibration Limits), project-related noise and vibration levels would be less than significant. However, if cumulative projects overlap with the proposed project, then noise levels in excess of the speech interference criteria could occur for longer than 10 work days or 2 weeks. As a result, the project's contribution would remain cumulatively considerable. Implementation of Mitigation Measure C-1, Coordinated Noise and Vibration Control Plan During Construction, described below, requiring EBMUD to prepare a coordinated noise and vibration control plan, would incorporate noise and vibration controls to ensure that where feasible combined noise and vibration levels from overlapping projects do not exceed the 70-dBA speech interference at the closest affected sensitive receptors for more than 2 consecutive weeks and that vibration limits are also not exceeded. Implementation of Mitigation Measure C-1 would reduce the project's contribution. However, construction at tie-in locations would continue for over 2 weeks, thereby exceeding the significance threshold of this impact. Further, noise levels may exceed the sleep interference criteria for up to one night at each tie-in location when hot tapping is conducted, or if nighttime work is required in some intersections. EBMUD would implement Mitigation Measure NOI-1 as well as Mitigation Measure NOI-3 (Nighttime Construction Measures). However, because it is uncertain whether these measures would reduce the impact to a less-than-significant level, the project's impact is considered to be significant and unavoidable. Based on this, the project's contribution to cumulative noise impacts would remain cumulatively considerable, even after implementation of project-level mitigation. Because there is no feasible mitigation to further reduce noise levels at the tie-in locations and from potential nighttime intersection work, the project's contribution would remain cumulatively considerable, and thus would be *significant and unavoidable*.

### Traffic-Related Noise during Construction

Construction activities associated with the proposed pipeline projects in combination with construction of the above-identified cumulative projects could result in cumulative increases in construction-related traffic, if construction-related truck traffic were to coincide on the same streets. Since these routes are collector or arterial streets which typically have higher ambient noise levels than local residential streets, temporary cumulative traffic increases on these routes are not expected to significantly alter ambient noise levels in their vicinities. In addition, limiting truck operations on local roadways to the construction hours specified by local noise ordinances would help ensure that this cumulative impact is *less than significant*.

**Mitigation Measure C-1: Coordinated Noise Control Plan During Construction.**

EBMUD will prepare a coordinated Noise and Vibration Control Plan that outlines noise and vibration controls to ensure that where feasible the 70-dBA speech interference threshold is not exceeded during the daytime hours (7 a.m. to 10 p.m.) for more than two consecutive weeks at one location without at least a one week break between projects and vibration thresholds listed in Mitigation Measure NOI-4 (Vibration Limits) are not exceeded when combined noise and vibration effects from cumulative projects are considered. At locations like the tie-in locations where the Project activities will extended beyond two weeks, EBMUD will attempt to coordinate with the cumulative projects to provide a week long gap between the construction activities.

## 5.3.11 Recreational Resources

### Impact C-11: Cumulative Impacts to Parks or Other Recreational Facilities.

The geographic scope of potential cumulative impacts on recreational resources encompasses the pipeline alignments and immediately adjacent areas that could be affected by construction activities

#### Access to Parks and Other Recreational Facilities and Tree Removal

During construction, the proposed project would disrupt access to the affected portion of the park strip between Parkside Drive and the Uplands in Berkeley; would disrupt recreational activities at Harding Park in El Cerrito and Kennedy Plaza in San Pablo due to construction-related dust and noise; and require temporary closure of the City of San Pablo's pocket park at Wildcat Creek for 10 weeks (see Section 3.12, Recreation, Impact 3.12-1). The project could also require removal of trees or other amenities at the pocket park (see Impact 3.12-2).

There would be no cumulative impact at the park strip in Berkeley or Kennedy Plaza and the pocket park in San Pablo because none of the cumulative projects listed in Table 5-1 would affect recreational uses at these parks. Therefore, no cumulative effect would occur.

Two pipeline projects by EBMUD (E-6 and E-7) could also affect recreational uses at Harding Park due to increases in construction-related noise and dust. However, similar to the proposed project, Harding Park would remain accessible and recreationists would also be able to utilize alternate nearby facilities if needed. Therefore cumulative impacts related to use of this park would be *less than significant*.

## 5.3.12 Transportation and Circulation

### Impact C-12: Cumulative Impacts Related to Increases in Traffic and Traffic Hazards, Access, and Parking.

The geographic scope for cumulative traffic impacts includes the local and regional roadways and highways that would be used for project-related construction activities and for access by construction workers and vehicles, and temporary detour routes used when roads on the pipeline alignments need to be closed during construction. The project's contribution to a significant cumulative (on-going) impacts related to traffic congestion (Impact 3.13-1) would not be considerable because the project-related impacts are restricted to the construction period.

Traffic-related impacts resulting from the proposed project would be restricted to the construction phase. Therefore, if the proposed project and other projects listed in Table 5-1 were under construction at the same time and affected the same roadways, the proposed project would contribute to cumulative construction-related traffic impacts, including temporary reductions in roadway capacity, short-term increases in traffic volumes and delays, and temporary impaired access for emergency response vehicles.

Potential cumulative impacts also could occur as a result of (1) infrastructure projects that could result in conflicting detour routes and work zones; and (2) cumulative projects that generate increased traffic at the same time on the same roads as would the proposed pipeline projects, causing increased congestion and delays. In addition to cumulative (additive) effects on traffic flow conditions, the proposed project and other cumulative projects would extend the period of time when there would be disruptions (albeit not all disruptions would be significant) to traffic flow on area roadways.

Of the many cumulative projects that are planned in the vicinity of proposed pipeline alignments, there are 23 projects that overlap (projects in bold in Table 5-1), cross, or are adjacent to proposed pipeline alignments and some are scheduled to occur during the same years as the proposed pipeline projects. Nine of these 23 projects are linear projects (sewer or water pipeline replacement, and transit or street improvements), where construction would progress along an alignment similar to the proposed pipeline projects.

As discussed in Section 3.13, Transportation and Circulation, the proposed project would result in significant traffic impacts related to reduced roadway capacity and increased traffic delays (Impact 3.13-1), limited access to adjacent land uses (Impact 3.13-4), and limited access to alternative transportation facilities (Impact 3.13-5). While it is uncertain whether the cumulative linear projects listed in Table 5-1 would occur at the same time and location as the proposed project, there is a potential for overlap. Depending on the degree of overlap, cumulative impacts related to each of these topics may occur. In addition, there are cumulative projects in Table 5-1 that, while not on the proposed pipeline alignments, could generate construction-related traffic on the same roads that the proposed project's construction workers and trucks would use to access the project work zones and could result in cumulative impacts related to reduced roadway capacity and increased traffic delays (Impact 3.13-1). These cumulative effects would be potentially significant, and the project's contribution could be cumulatively considerable.

As described in Section 2.8, the proposed project would implement traffic control plans (traffic handling schemes and detour routing), which would reduce traffic impacts during project construction. In addition, project-level mitigation would be implemented to reduce the project impact to a less-than-significant level, where possible. However, even with implementation of project-level mitigation, some impacts related to construction of the Central Zone Pipeline (Richmond/El Cerrito) on San Pablo Avenue would remain significant and unavoidable, including impacts related to reduced roadway capacity and increased traffic delays (Impact 3.13-1), limited access to adjacent land uses (Impact 3.13-4), and limited access to alternative transportation facilities (Impact 3.13-5). In addition, construction of the Wildcat Pipeline (El Cerrito) would result in a significant and unavoidable impact related to traffic delays at the intersection of San Pablo Avenue and Potrero Avenue.

To minimize the project's contribution to cumulative impacts related to these impacts, EBMUD would implement Mitigation Measure C-2, Coordinated Traffic Control Plan During

Construction, requiring EBMUD to develop a coordinated traffic control plan to ensure that potential impacts from overlapping projects are addressed with input from the Cities of Berkeley, El Cerrito, Richmond, and San Pablo. Specific measures to mitigate significant impacts that could occur would be determined as part of the interagency coordination, but could include measures such as employing flagmen during key construction periods, designating alternate haul routes, and providing more outreach and community noticing. Implementation of these measures, would help to minimize multiple disruptions to the same areas. However, significant and unavoidable impacts related to construction of the Central Zone Pipeline (Richmond/El Cerrito) on San Pablo Avenue and construction of the Wildcat Pipeline (El Cerrito) at San Pablo Avenue and Potrero Avenue would remain, therefore the project's contribution to cumulative traffic impacts would remain cumulatively considerable (*significant and unavoidable*)**.**

**Mitigation Measure C-2: Coordinated Traffic Control Plan During Construction.**

Prior to construction, EBMUD will develop a Coordinated Transportation Management Plan in coordination with the appropriate local government departments in Berkeley, El Cerrito, Richmond, and San Pablo to address the transportation impact of the overlapping construction projects within the vicinity of the West of Hills Project. The coordinated transportation management plan will include, but not be limited to, the following requirements:

- Coordination of individual traffic control plans for the project and nearby projects.
- Coordination between the contractor and EBMUD in developing circulation and detour plans that include safety features (e.g., signage and flaggers).
- Protocols for updating the transportation management plan to account for delays or changes in the schedules of individual projects.

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# CHAPTER 6
# Growth Inducement Potential and Secondary Effects of Growth

## 6.1 Introduction

This section analyzes the growth inducement potential and the associated secondary effects of growth of the proposed West of Hills Northern Pipelines Project (proposed Project), as required by CEQA. CEQA requirements that pertain to analyzing growth, other laws and regulations pertinent to land use and water supply planning, and the approach to the analysis of the Project's growth inducement potential are discussed below; Section 6.2 addresses the proposed Project's growth inducement potential; and Section 6.3 assesses the potential secondary effects associated with growth.

### 6.1.1 CEQA Requirements

CEQA requires that an EIR evaluate the growth inducing impacts of a proposed Project.[1] Under the *CEQA Guidelines*, an EIR must:

> Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a waste water treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing\community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

A project can have a direct effect on population growth if it would involve construction of substantial new housing. A project can have indirect growth inducement potential if it would (1) establish substantial new permanent employment opportunities or otherwise stimulate economic activity, or (2) remove an obstacle to additional growth and development, such as removing a constraint to or increasing the capacity of a required public service. For example, an increase in the capacity of utility or road infrastructure could allow either new or additional development in the surrounding area.

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1 CEQA Guidelines, California Code of Regulations Title 14, Chapter 3, Section 15126.2(d)

## 6.1.2 Approach to Analysis

Based on the CEQA discussion above, assessing the growth-inducement potential of the West of Hills Northern Pipelines Project involves addressing the question: *Would construction and/or operation of the proposed Project directly or indirectly support economic or population growth or residential construction?* In addition to addressing existing deficiencies in water transmission and storage capacity, implementation of the West of Hills Northern Pipelines Project would improve water supply reliability and provide capacity to meet projected future water demands; therefore, by removing lack of water supply reliability and capacity as potential obstacles to growth, the proposed Project would be growth-inducing according to the CEQA discussion above.

A variety of factors influence new development or population growth in the area served by the proposed Project, including economic conditions of the region, adopted growth management policies in the affected communities, and the availability of adequate infrastructure (e.g., water service, sewer service, public schools, and roadways, etc.), with economic factors generally the lead driver. Water service is one of the chief public services needed to support urban development, and a service capacity deficiency could constrain future development.

Pursuant to CEQA, growth per se is not assumed to be necessarily beneficial, detrimental, or of little significance to the environment. It is the secondary, or indirect, effects of growth that can cause adverse changes to the physical environment. The indirect effects of population and or/economic growth and accompanying development can include increased traffic and noise, degradation of air and water quality, conversion of agricultural land and open space to urban uses, and increased demand on community services and public service infrastructure, among other potential impacts. Local land use plans (e.g., general plans and specific plans) of the jurisdictions served by the proposed Project establish land use development patterns and set forth growth policies that allow for the orderly expansion of urban development supported by adequate public services, including water supply, roadway infrastructure, sewer service, and solid waste service. A project that would induce growth that is inconsistent with local land use plans could indirectly cause adverse environmental impacts, as well as impacts to public services, that were not previously envisioned by local jurisdictions and evaluated in the CEQA review of their land use plans and development proposals. Consequently, the level of growth supported by Project capacity improvements is evaluated for consistency with future planned growth outlined in applicable plans and policies.

The following steps were taken to investigate the proposed Project's growth inducement potential and to characterize the secondary effects on the environment resulting from such growth:

- **Identify Study Area.** For the purposes of the growth-inducement analysis, the study area comprises the area served by the West of Hills Northern Pipelines Project. As described in Chapter 2, Project Description (Section 2.2, Project Need), the Project would serve customers located in parts of north Oakland, Berkeley, Albany, El Cerrito, Richmond, San Pablo, Pinole, Hercules, and the unincorporated communities of West Contra Costa County including Crockett.

- **Describe the Regulatory Context for Water Supply and Land Use Planning.** Section 6.1.3 provides an overview of water supply and land use planning requirements in California to provide the reader with an understanding of the authorities and responsibilities that shape the nexus between decisions about water and land use.

- **Characterize Water Use and Growth Trends and the Growth Inducement Potential of the Proposed Project.** Section 6.2 describes EBMUD's water demand projections and methodology used to develop them; presents population forecasts prepared by the Association of Bay Area Governments (ABAG) for the area served by the West of Hills Northern Pipelines Project; describes growth trends, population projections, and growth management provisions outlined in the general plans of the jurisdictions served by the proposed Project; and evaluates the consistency of the proposed Project with growth anticipated by these local planning agencies.

- **Characterize the Secondary Effects of Planned Growth.** Even planned growth can have adverse impacts, and the environmental effects of planned growth have been evaluated in the CEQA documents prepared for jurisdictions' adopted general and specific plans and related planning documents. To characterize and disclose the impacts of planned growth, the EIRs prepared for the general plans of jurisdictions served by the proposed Project were reviewed and are summarized in Section 6.3.

## 6.1.3 Regulatory Context for Land Use Planning and Water Supply Planning

### Coordination of Land Use and Water Supply Planning

In California, cities and counties have primary authority over land use while water agencies, through laws and agreements, are expected and usually required to provide water service if water supply is available. To ensure the provision of water services to support planned development, state law requires close coordination and consultation between local land use and water supply planning agencies on issues pertaining to such planned development. The laws and agencies described below provide the regulatory and planning context for coordination among EBMUD and cities and counties within its service area.

**Regional Planning: ABAG.** ABAG is the key regional planning agency involved in forecasting growth in the area served by the proposed Project. An advisory organization, ABAG has examined regional issues such as housing, transportation, economic development, and the environment since its inception in 1961. ABAG's members include the nine Bay-Area counties and 101 cities, and its mission is to strengthen cooperation and coordination among local governments. ABAG's biennial[2] *Projections* series provides long-term population and economic forecasts that are relied on by transportation and air quality agencies, water agencies, local governments, and others.[3] ABAG forecasts are cited by many jurisdictions in their general plans.

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[2] Since the publication of its most recent *Projections* series in 2009, ABAG's forecasts have changed from a two-year cycle to a four-year cycle that is coordinated with the Sustainable Communities Strategy (discussed under SB 375 below in this section). The next forecast is scheduled to be released in 2013.

[3] Water demand projections in EBMUD's 1993 Water Supply Management Program were based on population projections derived from ABAG data; since 2000, however, EBMUD has based its demand projections on current and anticipated future land uses, rather than population projections, as described in more detail in Section 6.2.

ABAG's population projections for jurisdictions in the area served by proposed Project are presented in Section 6.2.

**General Plan Requirements.** Pursuant to State law,[4] each city and county is required to adopt a comprehensive, long-term general plan for the physical development of the jurisdiction. The general plan is a statement of development policies and is required to include land use, circulation, housing, conservation, open space, noise, and safety elements. The land use element designates the proposed general distribution, location, and extent of land uses and includes a statement of the standards of population density and building intensity recommended for lands covered by the plan. The city or county is required to prepare the water section of the conservation element in coordination with any countywide water agency and with all districts and/or city agencies that have developed, served, controlled, managed, or conserved water of any type for any purpose in the county or city for which the general plan is prepared. Coordination with the water agencies is required to include a discussion and evaluation of water supply and demand information contained in any applicable urban water management plan that has been submitted to the city or county by a water agency.[5]

**Urban Water Management Planning Act.** In 1983, the California Legislature enacted the Urban Water Management Planning Act.[6] The Act requires every urban water supplier that provides water to 3,000 or more customers or provides over 3,000 acre-feet of water annually to prepare and adopt an urban water management plan (UWMP) and update it every five years) for the purpose of "actively pursu[ing] the efficient use of available supplies."[7] In preparing the UWMP, the water supplier is required to coordinate with other appropriate agencies, including other water suppliers that share a common source, water management agencies, and relevant public agencies. When a city or county proposes to adopt or substantially amend a general plan, the water agency is required to provide the planning agency with the current version of the adopted UWMP, the current version of the water agency's capital improvement program or plan, and other information about the system's sources of water supply. The Urban Water Management Planning Act also requires urban water suppliers, as part of their long-range planning activities, to make every effort to ensure the appropriate level of reliability in their water service sufficient to meet the needs of their customers.

**Senate Bills 221 and 610.** SB 610[8] and SB 221[9] were companion legislative measures that took effect in January 2002 and require increased efforts to identify and assess the reliability of anticipated water supplies and increased levels of communication between municipal planning authorities and local water suppliers.

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4 California Government Code, Section 65300 *et seq.*

5 California Government Code, Sections 65302(d)(1).

6 California Water Code Section 10610 *et seq*.

7 California Water Code, Section 10610.4(c)

8 Codified at California Water Code Sections 10631, 10656, 10910, 10911, 10912, and 10915, and California Public Resources Code 21151.9.

9 Codified at California Government Code Sections 65867.5, 66455.3, and 66473.7, and California Business and Professions Code Section 11010.

- SB 610 requires that CEQA review for most large projects and specified smaller projects (including those that generate water demand greater than an equivalent of 500 dwelling units, or increase service connections by 10 percent) include a water supply assessment. The water supply assessment must address whether existing water supplies will suffice to serve the project and other planned development over a 20-year period in average, single dry-year, and multiple-dry year conditions, and must set forth a plan for finding additional supplies necessary to serve the project. Cities and counties can approve projects notwithstanding identified water supply shortfalls provided that they address such shortfalls in their findings.

- SB 221 requires that cities and counties impose a new condition of tentative subdivision approval, requiring that the applicant provide a detailed, written verification from the applicable water supplier that sufficient water supply will be available before the final subdivision map can be approved. It applies to similar sized projects as those addressed in SB 610.

**Senate Bill 7 of the Seventh Extraordinary Session (SBx7-7).** Enacted in November 2009, SBx7-7[10] requires all water suppliers in the State to increase the efficiency of water use; urban water suppliers are required to reduce per capita water consumption 20 percent by 2020 and to set and achieve interim targets by 2015.

## State Policies Encouraging Compact and Sustainable Development

In addition to the laws promoting coordinated land use and water supply planning, several recent laws have been adopted that seek to refocus planning efforts to reduce sprawl, preserve farmland, increase the viability of public transportation, and reduce the emission of greenhouse gases. These efforts promote compact and sustainable development, which allow for the more efficient provision of public services and reduce the consumption of resources – including water supply. Sustainable development includes the concept of more efficient water use, including the incorporation of water conservation and efficiency measures such as the use of recycled water, water efficient fixtures, and drought tolerant landscaping.

- **Assembly Bill (AB) 32,**[11] the Global Warming Solutions Act of 2006, was adopted with the goal of reducing greenhouse gas emissions to 1990 levels by the year 2020. The plan identifies measures to reduce the energy requirements associated with providing reliable water supplies. These measures include increased water use efficiency and water recycling and increasing water system energy efficiency.

- **SB 375**[12] was adopted in 2008 to require councils of governments (COGs) to align their housing and transportation plans and to develop a "sustainable communities strategy" that will reduce sprawl and improve air and water quality. ABAG and the Metropolitan Transportation Commission (MTC) are the COGs designated to develop a sustainable communities strategy for the nine-county Bay Area. In May 2012, MTC and ABAG officials voted to approve a draft plan, the Preferred Land Use and Transportation Strategy,

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[10] Codified at California Water Code Sections 10608 and 10800-10853.

[11] Codified at California Health and Safety Code Section 38500 *et seq*.

[12] Codified by amendments to California Government Code Sections 65080, 65400, 65583, 65584.01, 65584.02, 65584.04, 65587, 65588 and California Public Resources Code Section 21061.3 and the addition of Government Code Sections 14522.1, 14522.2 and 65080.01 and Public Resources Code Sections 21159.28 and 21155 *et seq*.

and in July 2012 voted to approve the five alternatives to be considered in the environmental review process. The final plan is scheduled to be adopted in April 2013.

- **SB 732**[13] was signed into law in 2008 and establishes the Strategic Growth Council, a cabinet-level committee that is tasked with coordinating the activities of State agencies to improve air and water quality, protect natural resources, and assist in the planning of sustainable communities.

- **AB 857**,[14] signed into law in 2002, establishes three planning priorities for the State: promoting infill development, protecting natural resources, and encouraging efficient development patterns. These priorities are to be incorporated into the Governor's Environmental Goals and Policy Report,[15] which provides a 20- to 30-year overview of State growth and development and guides the commitment of State resources in agency plans and infrastructure projects.

- The **Regional Blueprint Planning Program** is a grant program operated by the California Department of Transportation that provides assistance to COGs in developing long-range plans with the intent of supporting greater transit use, encouraging more efficient land use, improving air quality, and protecting natural resources.

### EBMUD Role in Water Supply and Land Use Planning

As a municipal utility district, EBMUD does not have authority to make land use decisions within its service area. It cannot approve or deny development proposals; that is the responsibility of the land use planning agencies of the counties and cities EBMUD serves. However, EBMUD is required by state law to make every effort to ensure the appropriate level of water service for the areas it serves. Because implementation of major water projects can take many years, planned facilities must be based on projected future demand rather than existing demand. As described in Section 6.2 below, EBMUD's water demand projections were developed based on the amount of development allowed under currently approved general plans and in consultation with the planning agencies in EBMUD's service area.

# 6.2 Growth Inducement Potential

## 6.2.1 Water Demand Projections

### EBMUD Service Area

As described in Chapter 2, proposed Project improvements have been sized to meet projected future increases in water demand, in addition to addressing existing transmission and storage deficiencies and improving reliability. The water demand projections are based on EBMUD's 2040 Demand Study (EBMUD et al., 2009), an element of EBMUD's Water Supply Management Program 2040. The study area for the 2040 Demand Study is EBMUD's service area based on its current Ultimate Service Boundary (USB). Within the USB, EBMUD's 123 individual pressure

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[13] Codified at California Public Resources Code Sections 75076, 75077, 75100 *et seq.*, and 75120 *et seq.*

[14] Codified at California Government Code Section 65041.1.

[15] Required in California Government Code Section 65041.

zones were grouped into 11 study regions called demand model regions (DMRs or regions), and projections of future water demands were prepared for each region. These regions and the USB are shown in **Figure 6-1**.

## Districtwide Update of Water Demand Projections

The Demand Study projections are based on current and future land uses, rather than on population projections. This land use based approach utilizes geographic information system (GIS) technology, existing data on water demand for different land use categories, and future changes in land use categories, based on adopted general and specific plans, to project future demand. This section describes the methodology used by EBMUD to develop these land use based projections. Water demands projected for the regions in the area served by the West of Hills Northern Pipelines Project are discussed under "Project Area Demand Projections," below.

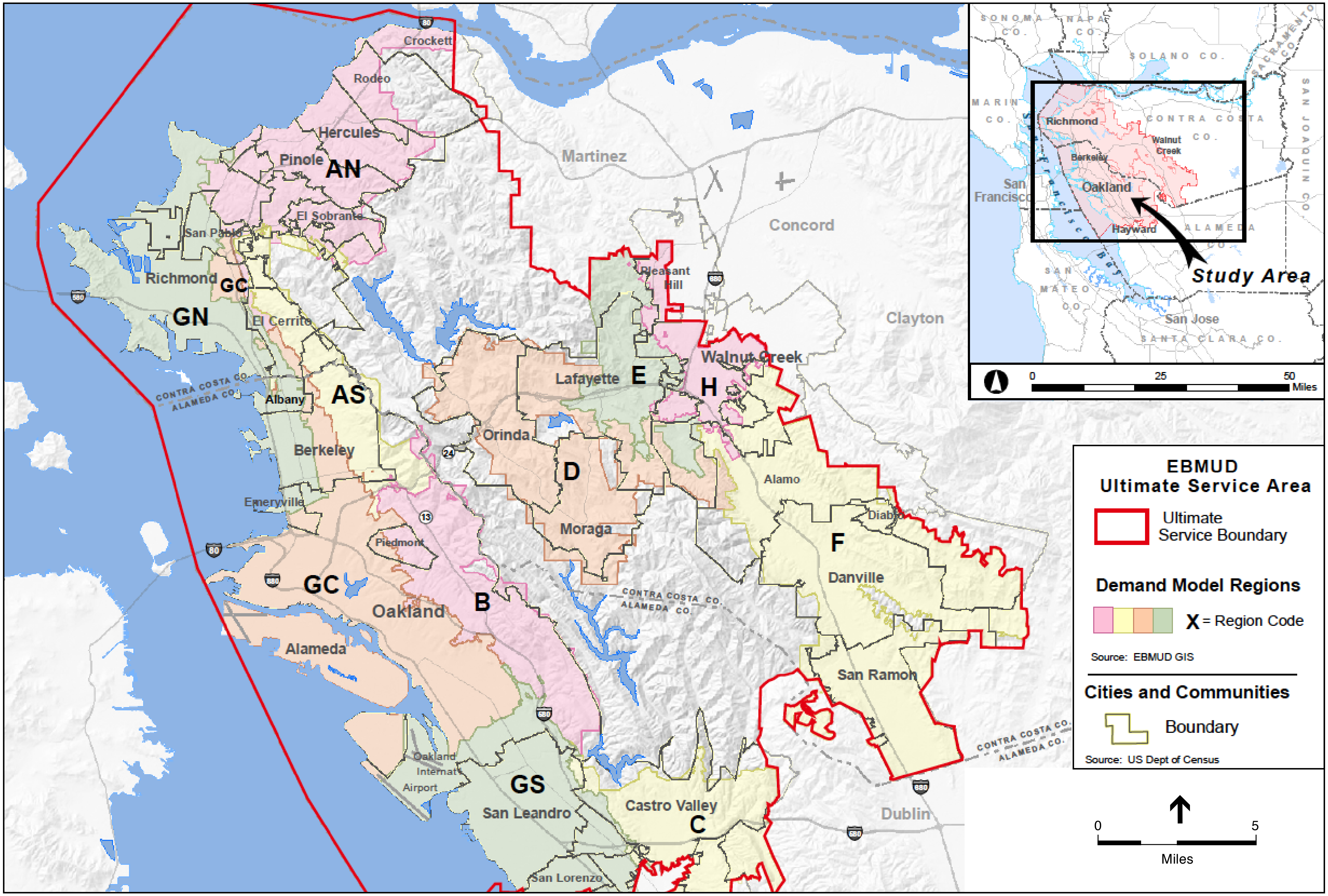
### *Existing Demand and Development of Land Use Unit Demands*

Projecting future water demands based on future land uses first entails determining existing land uses and the water demand associated with each category of land use. The 2040 Demand Study began with the GIS database from the previous 2000 Demand Study. For the previous study, polygons for each land use category had been digitized over aerial photographs to create a GIS land use coverage for EBMUD's entire service area (EBMUD and Montgomery Watson, 2000). This database was updated for the 2040 Demand Study by revising the land use polygons to match aerial photographs from 2005.[16] The land use categories used in the 2000 Demand Study were based on general plan land use categories of the cities and counties within the service area. Some new land use categories were needed for the 2040 Demand Study update – one for increased residential densities and several to reflect various densities of mixed residential and retail uses. The calendar year 2005 was used as the base year for defining existing land uses and water demands because it was the most recent year for which complete water use data were available that did not include water system anomalies such as droughts (EBMUD et al., 2009).

Existing base year demands were determined for each land use polygon based on metered 2005 consumption data. Using EBMUD's Demand Tool, a GIS-based application, the consumption data were first adjusted to reflect average conditions (i.e., they were normalized for weather and other factors) and to include unmetered water use;[17] the adjusted demand for each polygon was then divided by the area of the polygon to calculate the polygon's "land use unit demand" (LUD), expressed in units of gallons per day per acre (gpd/acre). The polygon demands and acreages were then aggregated by land use category and region to generate average LUDs per land use for each region (EBMUD et al., 2009).

[16] The 2000 Demand Study had used aerial photographs from 1996, the base year for that study.

[17] Unmetered water – water that leaves the distribution system without being metered resulting from both authorized and unauthorized sources and activities – is the difference between the total water produced at the water treatment plants and the total water consumption billed. It includes District unmetered facility used, system water quality control maintenance activities, fire flow, metering inaccuracies, water theft, leaks (both acceptable and not), pipeline and valve breaks, and potentially other identified losses (EBMUD et al., 2009).




SOURCE: EBMUD et al., 2009

EBMUD West of Hills Northern Pipelines . 211488

**Figure 6-1**
Demand Model Regions

Land use trends that would affect existing and projected future water demands were identified based on observed development activity since the 2000 Demand Study was prepared; information from planning agency meetings; reviews of general plan documents; and economic, demographic and real estate data. The 2040 Demand Study identified trends toward higher density land uses throughout EBMUD's service area.

### *Future Demand*

During the mapping of existing land uses described above, areas that appeared vacant and developable (according to general plans) were identified. Land uses that were expected to experience future changes in use or increases in density were identified based on published planning documents as well as observed changes that were currently in progress. Land use polygons in the GIS database were updated to reflect future development in accordance with general plans, and maps showing future land uses based on these revisions were prepared and presented to planning agencies for review. Consultation with planning agencies of the cities and counties in EBMUD's service area was a key aspect of the Demand Study: EBMUD staff and Demand Study consultants met with each of the city and county planning agencies to confirm general plan land use designations for future development, to identify redevelopment areas, and to identify phasing of future development between 2005 and 2040.[18] The information from planning agencies about the expected phasing of development was considered important because general plan planning horizons typically reflect a hypothetical buildout date used for the purpose of analyzing environmental impacts of full buildout, whereas actual development typically extends beyond these dates. Planning agencies updated the phasing of development that had been assumed in the 2000 Demand Study to the best of their knowledge, based on their understanding of developer interest and city development policy (EBMUD et al. 2009). The meetings with planning agencies were held during a time of economic expansion and the information agencies provided on the timing of development reflected the outlook at the time. Subsequently the economy contracted and entered a period of recession commencing in December 2007. Therefore, although the demand projections developed in the 2040 Demand Study reflect development planned in the general plans, the timing of development will likely occur more slowly than the Demand Study projects (EBMUD et al., 2009).

Future water demand was calculated by applying a future adjustment factor to the adjusted 2005 LUDs. If the existing land use was the same in future years, the adjustment factor reflected expected changing water usage due to infill development potential, changing consumption patterns, anticipated changes in occupancy rates, and increases in the number of jobs per acre as non-residential land uses are more intensively developed. If the existing land use was expected to change in the future, the water demand was calculated using the base year (2005) adjusted average LUD for the new land use designation with an adjustment factor applied to allow the future land use category to reflect consumption patterns of recent developments. This process was conducted with the Demand Tool for each of 36 identified land use categories for the 11 regions, determining average annual demands for the planning periods of 2010, 2015, 2020, 2025, 2030,

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[18] Projections were developed in five-year increments from 2005 to 2030 and for 2040, but not for 2035 because planning agencies provided less specificity on the phasing of development toward the end of the planning horizon. Establishment of the five-year increments enables EBMUD to plan and prioritize new distribution system facilities (EBMUD et al., 2009).

and 2040. Future LUDs for land use categories representing unique water users were determined individually. Unique water users in the West of Hills area include mixed residential and non-residential land uses, which were analyzed and determined to require the same LUD as the mixed use's underlying residential density.

Planned conservation programs and water recycling projects will offset a portion of future distribution system demand. EBMUD's Water Supply Management Program 2040 (WSMP 2040) provided the basis for Demand Study estimates of reductions in distribution system demand due to conservation and non-potable water use; the average annual demands calculated as described above were further adjusted to incorporate projections based on WSMP 2040's preferred portfolio of conservation and non-potable water programs. The WSMP 2040 projects that usage of non-potable water will increase from 6 million gallons per day (mgd) in 2005 to 20 mgd in 2040. Conservation savings are projected to increase from 18 mgd in 2005 to 62 mgd in 2040 (EBMUD et al., 2009). **Table 6-1** shows projected Districtwide system demand for 2005-2040 with and without adjustments for conservation and water recycling.[19]

**TABLE 6-1**
**DISTRICTWIDE DEMAND PROJECTIONS**
**ADJUSTED FOR CONSERVATION AND NON-POTABLE WATER USE[a] (mgd[b])**

| | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 | 2040 | 2005–2040 Change (mgd) | Percent Change 2005–2040 |
|---|---|---|---|---|---|---|---|---|---|
| System Input (Unadjusted)[c] | 238 | 251 | 266 | 280 | 291 | 304 | 312 | 74 | 31.1% |
| Cumulative Conservation | -18 | -25 | -32 | -40 | -47 | -55 | -62 | -44 | 244.4% |
| Cumulative Non-Potable Water | -6 | -10 | -17 | -19 | -20 | -20 | -20 | -14 | 233.3% |
| **System Input (Adjusted)[d]** | **214** | **216** | **217** | **221** | **224** | **229** | **230** | **16** | **7.5%** |

NOTES:

[a] Projections were developed for five-year planning periods from 2005 to 2030 and for 2040 based on information provided by planning agencies; projections were not developed for 2035 because less specificity on the phasing of development was provided for the end of the planning horizon.

[b] mgd = million gallons per day.

[c] System input (unadjusted) is system input (i.e., the quantity of water that enters the distribution system from treatment plant production and groundwater inflow to Claremont Tunnel) including normalization and unmetered water, but without offsets from non-potable water and conservation savings.

[d] System input (adjusted) is system input adjusted for normalization, unmetered water, non-potable water usage, and conservation savings.

SOURCE: EBMUD et al., 2009

[19] The Demand Study was conducted before SBX 7-7 – requiring a 20 percent reduction in per capita water use by 2020 – was adopted (see Section 6.1.3). However, as the overall demand projections presented in Table 6-1 show, demand adjusted for conservation and the use of nonpotable water is expected to be 59 mgd lower in 2020 than unadjusted demand. While continuing to develop programs and measures to achieve the 20x2020 target, EBMUD believes the water conservation and non-potable water goals shown in Table 6-1 will allow it to meet the 20 percent per capita reduction goal set by SBX 7-7.

## Project Area Demand Projections

As noted above, the 2040 Demand Study divided EBMUD's 123 pressure zones into 11 regions (shown in Figure 5-1) and future water demands were forecasted by region. Part or all of regions AN, AS, GN, and GC are located in communities served by the West of Hills Northern Pipelines Project. These four regions and the communities they include are shown in **Table 6-2**. Existing and projected water demands for these regions are shown in **Table 6-3**. For comparison, the other regions in EBMUD's service area are also shown. As the table shows, Regions GC and GN are projected to experience the greatest increase in demands.

Existing land uses and growth-related trends identified in the Demand Study for the regions located in the area served by the West of Hills Northern Pipelines Project are summarized below.

### *Region AN*

This region is located in the northwestern part of the service area and includes Hercules and the unincorporated community of Crocket, most of Pinole, and parts of Richmond and San Pablo, as well as parts of the unincorporated communities of Rodeo and El Sobrante. This region is characterized by lower density suburban land uses than other regions in EBMUD's West of Hills area.

#### Trends and Projections

All new construction is occurring at higher densities than in the past. Since the mid 1990's high density residential development grew faster than low density residential, a trend that is expected to continue. Job densities are expected to remain low due to the availability of existing vacant and underutilized office, industrial, and retail lands. Large lot development areas are available; small vacant infill lots are expected to develop more slowly. High water users include a refinery and food processing plant; however, most jobs are in health, education and recreation, and the largest job growth is expected in the financial and professional services sectors.

### *Region AS*

This region is located in the Berkeley Hills and includes parts of Berkeley, Richmond, El Cerrito, San Pablo, northern Oakland, and the unincorporated communities of Kensington and El Sobrante. The region is characterized primarily by medium-density residential development; it also includes U.C. Berkeley, downtown Berkeley east of Shattuck Avenue, and high density student housing and dense commercial land uses.

#### Trends and Projections

Extensive development is planned for downtown Berkeley, including high rise office and housing developments and a regional cultural center. These developments are expected to substantially increase water demands, based in part on the LUDs of recent mixed-use developments in the region. Increased density of development is planned within existing land use designations in the downtown Berkeley area. The region also includes potential for additional low density residential development, including areas of the 1991 Oakland/Berkeley Hills fire zone, which continues to build out.

**TABLE 6-2**
**DEMAND MODEL REGIONS IN PROJECT AREA**

| Region[a] | Region Location |
|---|---|
| AN | Northwestern service area; the unincorporated communities Crocket, Rodeo, and El Sobrante, the cities of Pinole and Hercules, the Hilltop area of Richmond, and small part of San Pablo and El Cerrito |
| AS | Berkeley Hills, includes parts of the cities of Berkeley, Richmond, El Cerrito, San Pablo, and Oakland, and parts of the communities of Kensington and El Sobrante |
| GN | Includes most of Richmond and Albany, western San Pablo, western Berkeley, and northern Emeryville |
| GC | Largest region in the study area; includes Alameda, most of Oakland, southern Emeryville, central portions of Berkeley, El Cerrito, and San Pablo, and parts of Richmond and Piedmont. |

[a] The demand model regions are shown in Figure 5-1.

SOURCE: EBMUD et al., 2009

**TABLE 6-3**
**WATER DEMANDS BY DEMAND MODEL REGION**

| | System Input (Adjusted)[a] (mgd[b]) | | 2005–2040 Change (mgd[b]) | Percent Change 2005–2040 |
|---|---|---|---|---|
| | 2005 | 2040 | | |
| **Project Area Region** | | | | |
| AN | 22 | 22 | 0 | 0% |
| AS | 12 | 12 | 0 | 0% |
| GN | 29 | 32 | 3 | 10% |
| GC | 48 | 61 | 13 | 27% |
| **Subtotal: Project Area Regions** | 111 | 127 | 16 | 14% |
| **Other Service Area Regions** | | | | |
| B | 11 | 11 | 0 | 0% |
| C | 10 | 10 | 0 | 0% |
| D | 11 | 12 | 1 | 9% |
| E | 7 | 6 | -1 | -14% |
| F | 34 | 32 | -2 | -6% |
| GS | 22 | 23 | 1 | 5% |
| H | 9 | 9 | 0 | 0% |
| **TOTAL: District Service Area** | **214** | **230** | **16** | **7%** |

NOTE: Columns may not sum to the totals shown due to rounding.

[a] System input (adjusted) is the quantity of water that enters the distribution system from treatment plant production and groundwater inflow to Claremont Tunnel adjusted for normalization, unmetered water, non-potable water usage, and conservation savings.
[b] mgd = million gallons per day.

SOURCE: EBMUD et al., 2009

### *Region GN*

This region includes much of San Pablo, Albany, and Richmond, and parts of El Cerrito, Berkeley, and Emeryville. It is a highly urbanized area characterized primarily by medium-density residential land uses, followed by low-density industrial uses.

#### Trends and Projections

This region is projected to be the second most dynamic in terms of land use and density changes (after Region GC, discussed below). Richmond is expected to dominate the region's trends due to substantial areas of industrial lands in the city that will be redeveloped with residential and mixed uses at higher densities (CBRE, 2007). The expansion of the Chevron refinery in Richmond may also increase demands in this region. Old industrial sections of Berkeley are being redeveloped with new uses, including offices, live-work units, small manufacturing, and extensive retail and service uses, and a trend of more multigenerational households is occurring in San Pablo and Richmond. The San Pablo Avenue corridor from Oakland to San Pablo has been gradually redeveloped with higher density mixed use projects. Low-intensity industrial land uses are expected to decrease and higher intensity uses are planned by cities in the region. Jobs in the retail and financial and professional services sectors are expected to increase (EBMUD et al., 2009).

#### Region GC

This region is the largest region in the 2040 Demand Study area and for the most part is located south of the area served by the West of Hills Northern Pipelines Project. It includes most of Oakland and all of Alameda, central portions of Berkeley, El Cerrito, San Pablo, and parts of Emeryville, Piedmont, Albany, and Richmond. It is characterized primarily by medium-density residential development, followed by low-intensity industrial and general commercial and industrial land uses. It is a highly urbanized area with substantial employment and good transportation options.

#### Trends and Projections

This region is projected to have the most changes in land use and density, with Oakland and Alameda driving the region's trends due in part to the redevelopment of major military bases in these cities (CBRE, 2007). Extensive land area at the Oakland Army Base is expected to be redeveloped to higher-intensity uses; the Alameda Naval Air Station is also being redeveloped, with most construction expected to be completed by 2030. Recent trends in the region of transit-oriented development (increasing residential and commercial densities near BART stations and along transit corridors) and very high-density residential development in some areas are expected to continue. Very high densities of residential and office uses are planned for downtown Oakland and Berkeley, while a small area of Emeryville near existing big box retail is rapidly redeveloping with four-story multi-family housing. The Oakland Airport expansion is expected to generate increased demands associated with more passengers, employees, and airport-related industries. Low-density residential and commercial office uses in some areas are expected to be redeveloped as mixed use-very high density residential land uses, and about 1,000 acres of new commercial land uses are planned to be developed within the region by 2030 (EBMUD et al., 2009).

## 6.2.2 Projections of Planning Agencies in the Project Area

### ABAG Projections 2009

As discussed in Section 6.1.3, ABAG is the key regional planning agency of the San Francisco Bay Area involved in forecasting growth. ABAG's *Projections* series, which provide long-term population, housing, and economic forecasts through a series of computer models, are used by numerous local agencies for planning purposes. EBMUD used ABAG's population projections as the basis for its 1993 Water Supply Management Program, and ABAG demographic data, along with that of other sources, were used to assess regional trends in the update of existing demands for the 2040 Demand Study. This section presents the population projections provided in ABAG's current projections series (ABAG, 2009) for the cities in the area served by the Project. However, because EBMUD based the 2040 Demand Study on future approved land uses and land use densities, rather than on population forecasts, EBMUD's growth assumptions cannot be directly compared with ABAG's.

ABAG provides projections for cities (areas within city limits), as well as projections for subregional areas that include the cities and any unincorporated lands included in the cities' planning areas (e.g., the cities' spheres of influence). ABAG also provides forecasts for unincorporated areas. The proposed Project would serve parts of north Oakland, Berkeley, Albany, El Cerrito, Richmond, San Pablo, Pinole, Hercules, and the unincorporated West Contra Costa County community of Crockett. **Table 6-4** shows ABAG projections extrapolated to 2040. Because ABAG's current forecasts only extend to 2035, they were extended to 2040 for this analysis by applying the average annual growth rate for the period 2000 through 2035 to the 2035 forecasts. Table 6-4 also shows the percentage increase in forecasted population growth for this period. The percentage increase in water demand projected by EBMUD for the regions in the project area (shown in Table 6-3) is also included for comparison purposes.

As shown in Table 6-4, the percent increase projected by EBMUD for water demand in the AN, AS, GN and GC demand model regions is substantially less than the percent increase indicated by ABAG's projections for project area cities over the same period. The lower percentage increase reflected in projected water demand is likely due both to adjustments to demand to reflect projected water conservation savings and nonpotable water use, and to the Demand Study's land-use-based approach, based on the jurisdictions' general plans and phasing information provided by the planning agencies. As the Demand Study explicitly states, its projections "do not reflect the greatest potential water demands, but rather, reflect current planning policy by land use agencies. Higher demand projections may be associated with other forecasting techniques such as long range population projections or demands based on assumptions that most land uses will increase in density over time without specifically reflecting community policy" (EBMUD, 2009, p. 6-1).

**TABLE 6-4**
**ABAG POPULATION PROJECTIONS**

| | 2005 | 2035[a] | 2040[b] | Change 2005–2040 | Percent Change 2005–2040 (%) | Percent Change 2005–2040 EBMUD Water Demand Projections[c] |
|---|---|---|---|---|---|---|
| Cities – Jurisdictional boundaries | | | | | | |
| Oakland | 410,600 | 562,000 | 590,083 | **179,483** | 43.7 | |
| Berkeley | 104,400 | 120,500 | 123,276 | 18,876 | 18.14 | |
| Albany | 16,800 | 19,300 | 19,747 | 2,947 | 17.5 | |
| El Cerrito | 23,400 | 26,200 | 26,664 | 3,264 | 13.9 | |
| Richmond | 102,700 | 139,600 | 146,579 | **43,879** | 42.7 | |
| San Pablo | 31,000 | 37,700 | 38,911 | 7,911 | 25.5 | |
| Pinole | 19,700 | 26,500 | 27,782 | 8,082 | 41.0 | |
| Hercules | 23,600 | 34,900 | 37,929 | 14,329 | 60.7 | |
| **Subtotal (Cities)** | **732,200** | **966,700** | **1,010,970** | **278,770** | **38.1** | |
| Unincorporated Contra Costa County | 159,650 | 184,450 | 189,675 | 30,025 | 15.5 | |
| **TOTAL (Cities and Unincorporated County)** | **891,850** | **1,151,150** | **1,200,646** | **308,796** | **34.6** | **14%** |
| Cities – Including Spheres of Influence | | | | | | |
| Oakland | 410,600 | 562,000 | 590,083 | **179,483** | 43.7 | |
| Berkeley | 104,400 | 120,500 | 123,276 | 18,876 | 18.1 | |
| Albany | 16,800 | 19,300 | 19,747 | 2,947 | 17.5 | |
| El Cerrito | 29,300 | 32,200 | 32,666 | 3,366 | 11.5 | |
| Richmond | 120,000 | 161,000 | 168,835 | **48,835** | 40.7 | |
| San Pablo | 35,100 | 42,500 | 43,837 | 8,737 | 24.9 | |
| Pinole | 31,700 | 39,800 | 41,283 | 9,583 | 30.2 | |
| Hercules | 23,600 | 34,900 | 37,927 | 14,327 | 60.7 | |
| **Subtotal (Subregional Areas)** | **771,500** | **1,012,200** | **1,057,654** | **286,154** | **37.1** | |
| Unincorporated – Remainder[d] | 6,800 | 8,100 | 8,380 | 1,580 | 23.2 | |
| **TOTAL (City Subregional Areas and Other Unincorporated)** | **778,300** | **1,020,300** | **1,066,035** | **287,735** | **37.0%** | **14%** |

a 2035 is the horizon year for ABAG's current projections.
b Because the Demand Study horizon was 2040, to compare the ABAG and Demand Study growth rates for this analysis, ABAG's projections were extended to 2040 by applying the compound annual average rate reflected in the ABAG forecasts for 2000 to 2035 for the respective cities to the 2035 figures (the same methodology used in the Demand Study for its use of ABAG projections).
c Percent change of projected water demands is based on the four demand model regions located partly or entirely in the area served by the project (see Table 6-3); shown here for comparison purposes.
d The "remainder" area is composed of unincorporated areas that are outside cities' spheres of influence or planning areas.

SOURCE: ABAG, 2009; EBMUD et al., 2009

## Local Planning Agency Projections

The information presented for local planning agencies is based on review of currently adopted general plans and related planning documents of the cities and county[20] served by the Project. This section provides an overview of anticipated growth included in those plans. As with the ABAG projections, a direct comparison of growth assumed in EBMUD's Demand Study with population projections contained in local general plans and related planning documents is not possible since EBMUD did not rely on population forecasts as the basis of the Demand Study. However, comparing annual average growth rates derived from the population projections with water demand projections provides a means to consider generally whether the projected water demands that the Project capacity improvements would accommodate are consistent with population growth projected and planned for in the adopted general plans of the affected jurisdictions. **Table 6-5** presents the population projections included in the general plans of the cities served by the Project and unincorporated Contra Costa County. Because the local jurisdictions have varying planning horizons (see table footnote b) and lengths of time between base and horizon years, the total projected change represented by the various projections cannot be directly compared. Therefore, to provide a means of considering the general consistency of projections of jurisdictions having a variety of planning horizons, the table shows calculated annual average growth rates based on the respective projections. In actuality, neither population growth nor the growth in water demand is expected to occur at an average annual rate, and EBMUD planning does not assume an average annual growth rate. ABAG's jurisdictional projections for 2005 and 2035 are also included for comparison purposes.

## City of Berkeley

According to the City's *2009-2014 Housing Element*, which was adopted in 2010 and is considered part of the *City of Berkeley General Plan: A Guide for Public Decision-Making*,[21] in 2000 Berkeley began to grow again, after 30 years (1970-2000) of slightly declining population (City of Berkeley, 2010). Population grew by about 4 percent between 2000 and 2008. The housing element projects that the city's population will grow an additional 11 percent between 2010 and 2030 based on ABAG's *Projections 2007* (City of Berkeley, 2010). The housing element indicates the city has capacity to accommodate about 3,000 additional housing units on underutilized parcels throughout the city (City of Berkeley, 2010) and identifies four main areas with the greatest potential for new units: the downtown area, the southside area, the commercial corridors, and vacant lots in residential districts (City of Berkeley, 2010).

[20] Because part of the area served by the project is unincorporated Contra Costa County, this section includes information on anticipated growth presented in the county's General Plan. This section does not include a summary of the Alameda County General Plan because in Alameda County the area served by the West of Hills Pipelines Project is entirely within incorporated cities; land use in these cities is governed by the cities' General Plans.

[21] The City's General Plan includes individual elements that, except for the 2010 Housing element, were adopted in 2001 and 2002.

**TABLE 6-5**
**ABAG AND CITY/COUNTY POPULATION PROJECTIONS**

| Cities (jurisdictional boundaries) | ABAG Projections 2009[a] | | | Local Planning Projections[b] | Average Annual Percent Growth[c] | EBMUD Water Demand Projections Average Annual Growth[d] |
|---|---|---|---|---|---|---|
| | 2005 | 2035 | Average Annual Percent Growth (2005–2035) | | | |
| Oakland[e] | 410,600 | 562,000 | 1.05% | 464,700 | 0.84 | |
| Berkeley[f] | 104,400 | 120,500 | 0.48% | 119,400 | 0.44% | |
| Albany[g] | 16,800 | 19,300 | 0.46% | 17,020 | 0.21% | |
| El Cerrito[h] | 23,400 | 26,200 | 0.38% | 25,600 | 0.40% | |
| Richmond[i] | 102,700 | 139,600 | 1.03% | 132,600 | 1.17% | |
| San Pablo[j] | 31,000 | 37,700 | 0.65% | 34,950 | 0.41% | |
| Pinole[k] | 19,700 | 26,500 | 0.99% | 21,800 | 0.48% | |
| Hercules[l] | 23,600 | 34,900 | 1.31% | 27,500 | 1.74% | |
| **Subtotal-cities only** | **732,200** | **966,700** | **0.93%** | **843,470** | - | |
| Unincorporated Contra Costa County[m] | 159,650 | 184,450 | 0.48% | 1,128,800 | 0.87% | |
| Unincorporated County – West County only[n] | See note o | See note o | See note o | 54,682 | 0.19% | |
| **Total** | **891,850** | **1,151,150[p]** | **0.85%** | **898,152[q]** | **-** | **0.4%** |

a ABAG projections for cities are for the area within jurisdictional boundaries (i.e., they do not include the cities' spheres of influence).
b Local projections represent population projections presented in general plans; projections are for the planning horizon indicated in each plan. Oakland's population projection is for 2020; Berkeley's is for 2035; Albany's is for 2010, El Cerrito's is for 2030; Richmond's is for 2030; San Pablo's is for 2030; Pinole's is for 2030; Hercules' is for 2020; and Contra Costa County's is for 2020.
c Average annual percent growth was calculated based on information presented in the planning documents for the respective jurisdictions (i.e., base and horizon year populations and number of years between the two). Because the number of years between base and horizon years varies in the different general plans, average annual percent growth was not calculated for the subtotal or total of the local projections.
d Average annual percent change of projected water demands, 2005 to 2040, is based on the total projected of the four demand model regions located partly or entirely in the area served by the Project (see Table 6-3), shown here for comparison purposes.
e Oakland General Plan forecast is for the year 2020 based on Oakland Housing Element 2007-2014; population growth rate is based on a 2008 population of 420,183 and a 2020 population of 454,700.
f Berkeley general plan forecast is for the year 2035. The average annual growth rate is based on a 2010 population of 106,900 and a 2035 population of 119,400.
g Albany General Plan forecast is for the year 2010. The average annual growth rate is based on a 1990 population of 16,327 and a 2010 population of 17,020.
h El Cerrito General Plan forecast is for the year 2030. The average annual growth rate is based on a 2008 population of 23,431 and a 2030 population of 25,600.
i Richmond General Plan forecast is for the year 2030. The average annual growth rate is based on the estimated 2010 population (from ABAG) of 105,000 and a 2030 population of 132,600. Assuming the California Department of Finance estimated population for the city in 2009 of 104,513, which is also noted in the General Plan, the average annual growth rate is slightly less, 1.14 percent.
j San Pablo General Plan forecast is for the year 2030. The average annual growth rate is based on a 2010 population of 32,200 and a 2030 population of 34,950.
k Pinole General Plan forecast is for the year 2030. The average annual growth rate is based on a 2008 population of 19,629 and a 2030 population of 21,800.
l Hercules General Plan forecast is for the year 2020. The average annual growth rate is based on a 2000 population of 19,488 and a 2020 population of 27,500.
m This projection for Contra Costa County, presented in the General Plan, is for the entire county – including incorporated cities. The average annual growth rate is based on a 2000 population of 948,816 and a 2020 population of 1,128,800.
n The projection for West County is based on the 2009 Housing Element projected population of unincorporated West County in 2020; the average annual growth rate is based on a 2010 population of 53,634 and a 2020 population of 54,682.
o ABAG does not provide projections for subareas of unincorporated Contra Costa County.
p Total shown includes incorporated cities plus unincorporated areas of the entire county.
q Total shown includes incorporated cities plus unincorporated West County only.

SOURCE: City of Oakland, 2010; City of Berkeley, 2010; City of Albany, 1992a; City of El Cerrito, 2012a; City of Richmond, 2012; City of San Pablo, 2011a; City of Pinole, 2010a; City of Hercules, 2003; Contra Costa County, 2005, 2009; EBMUD et al., 2009

The General Plan is intended to be implemented in concert with more detailed area plans, two of which have recently been adopted:

- The *Downtown Area Plan*, adopted in March 2012, includes zoning changes that provide for increased building heights in the core and outer core regions of the plan area and a goal of encouraging "high density highly livable development" in the downtown area (City of Berkeley, 2012).
- The goals of the *Southside Plan*, adopted in 2011, include creation of additional housing and providing for a high-density residential and commercial mixed use edge to the university campus and along both sides of Telegraph Avenue south of the campus (City of Berkeley, 2011).

Another area plan, the West Berkeley Project, has not been adopted but is currently under consideration. It would amend current zoning regulations that apply to the manufacturing zoning districts in West Berkeley. It is intended to encourage the reuse and expansion of existing buildings by removing current zoning obstacles that make it difficult for new businesses to begin and existing businesses to expand (City of Berkeley, 2009).

### *City of Albany*

The *City of Albany General Plan and Final EIR*, adopted in 1992, describes the city as a mature, primarily residential community that is largely built out. Adopted in 1992, the Albany General Plan encompasses a 20 year planning period (1990 to 2010) and estimated that the population at buildout would be 17,020, a 4.2 percent increase from the city's 1990 population of 16,327 (City of Albany, 1992a.

Because ABAG did not have forecasts of the city's 2010 population when the General Plan was prepared, the estimate of buildout population was based on the number of housing units expected to be added by buildout; the assumption that the 2010 vacancy rate would be comparable to that in 1994; and ABAG's estimate of household size in 2005, which was expected to stay constant to 2010 (City of Albany, 1992a). According to the 2010 U.S. Census the city's population in 2010 was 18,539, about 9 percent greater than the General Plan projection.

The city's current Housing Element was adopted as part of the comprehensive 1992 General Plan update. Since then, the city has prepared draft updates of the housing element, including one in 2009, but none has been adopted by the city or certified by the State (City of Albany, 2012a). The city has received its draft Regional Housing Need Allocation for the 2014-2022 and is tentatively planning to initiate a housing element update when it receives its Regional Housing Need Allocation for the 2014-2022 cycle (Hersch, 2012)[22].

The General Plan states that because the amount of vacant land in the city is very limited, redevelopment of existing underdeveloped areas provides the greatest opportunities for future growth. Areas identified in the General Plan that would accommodate increased residential

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22 ABAG issued draft allocations to jurisdictions in summer 2012 and expects the final allocation for the 2014-2022 cycle to be adopted in early summer 2013 (Wong, 2012).

densities or the intensification of existing commercial and light industrial uses include an eight-block area along San Pablo Avenue zoned Commercial Expansion; part of the Albany Bowl site on San Pablo Avenue; the Hill Lumber site just east of the BART station; and portions of University of California lands adjacent to Albany Village. University Village, a project that includes commercial development and senior housing on 6.3 acres at the last site listed here (on University of California lands) is currently being considered by the city council (City of Albany, 2012b).

### City of El Cerrito

The *City of El Cerrito 1999 General Plan*, adopted in 1992, describes the city as predominantly residential and largely built out (El Cerrito, 1999). According to the City of El Cerrito 2007-2014 Housing Element Update (City of El Cerrito 2012a), after growing steadily since the city's incorporation in 1917 until the 1960s, El Cerrito's population decreased slightly between 1960 and 1980, as the city approached build-out (City of El Cerrito, 2012a[p. 17 of 90]), and remained relatively stable over the two decades prior to the 1999 General Plan's preparation (City of El Cerrito, 1999 [p. 3-4]). The General Plan cites ABAG's Projections 1998 as the source for projected growth in the city and its planning area between 1995 and 2020. Over that period the city and its planning area, which includes the unincorporated communities of Kensington and East Richmond Heights, were projected to grow from a population of 29,500 in 1995 to 31,900 in 2020. The General Plan anticipates that the city's existing development pattern will remain largely unchanged over the plan's 20 years planning period, and that all commercial growth and most residential growth will occur within the San Pablo Avenue corridor; increases in retail and office space are expected to result from the redevelopment of existing retail and office land uses (City of El Cerrito, 1999[p 4-4]). According to the General Plan Housing Element, which was adopted in February 2012, much of the city's population growth between 1990 and 2000 (from 22,869 to 23,171 residents) resulted from infill development, redevelopment, and changes in household size and that the limited growth that occurred between 2000 and 2008 was infill development. Citing the Census Bureau's American Community Survey (ACS) estimate of the city's population in 2008 and ABAG's 2009 projections series, the housing element projects the city will grow from a population of 23,431 in 2008 to 25,600 in 2030 (City of El Cerrito, 2012a), a 9 percent increase. According to the 2010 U.S. Census, the city's 2010 population was 23,549, largely unchanged from the ACS estimate for 2008. The housing element inventory of sites having the potential for higher density development concludes that, notwithstanding constraints at many sites, the city can accommodate its regional housing need allocation of 431 additional housing units for the 2007-2014 housing allocation period (City of El Cerrito, 2012a).

### City of Richmond

The *Richmond General Plan 2030*, adopted in April 2012, indicates that the city has experienced renewed growth in recent years and is expected to continue to grow in the future. The General Plan cites California Department of Finance estimates for the city's 2009 estimated population of 104,513, and cites ABAG's 2009 projection that the city's population will increase from 105,000 in 2010 to 132,600 in 2030 (City of Richmond, 2012).

Because there is little remaining undeveloped land in the city, the General Plan anticipates that future growth will be accommodated though infill development in the downtown area and along commercial corridors, and on underutilized brownfield parcels in the city's industrial areas. The General Plan promotes transit-oriented development around the Richmond BART/Amtrak Station and encourages higher density and mixed-use development along key transit corridors, which is expected to result in increased transit ridership on these routes. In partnership with the City of El Cerrito, Richmond has also developed the San Pablo Avenue Specific Plan to guide future development along that corridor.

### *City of San Pablo*

The *San Pablo General Plan 2030*, which was adopted in 2011, projects that under General Plan buildout the city's population will increase by about 8.5 percent – from about 32,200 in 2010 to 34,950 in 2030. While the General Plan cites ABAG as the source for the city's estimated current (2010) population, number of households, and jobs, the plan's projected growth by 2030 is based on development assumed to occur under buildout of the General Plan. Planned development includes construction of 990 new housing units over the General Plan period (City of San Pablo, 2011a).

The General Plan states that its maps and policies are structured around several key initiatives, including economic development through the redevelopment of vacant and underutilized sites and development of new employment-generating land uses along major transportation corridors; the creation of a pedestrian and bicycle-friendly community; and development of future parks and open space areas throughout the city's planning area.

### *City of Pinole*

The City of Pinole's *General Plan Update* was adopted in October 2010. It describes the city as a bedroom community with a mix of residential neighborhoods, commercial and business centers, and parks and open spaces. The General Plan describes the city as largely built out, while having opportunities for infill mixed used development; the city does not anticipate expanding its sphere of influence or annexing any land into the city in the foreseeable future. Citing ABAG's *Projections 2007* the General Plan indicates the city is expected to grow from a population of 19,039 in 2000 to 21,800 in 2030, an increase of 2,761 residents, or about 13 percent (City of Pinole, 2010a, p. 4.0-4).

Objectives of the General Plan include focusing new residential and commercial development in existing urbanized areas with sufficient densities to support transit service and encouraging development of improved bicycle and pedestrian facilities. The land use and economic development element includes goals, policies, and actions intended to concentrate new development primarily along transportation corridors.

The city is planning for growth to occur primarily along San Pablo Avenue, Appian Way, and Pinole Valley Road, which have been designated as priority development areas (City of Pinole, 2010a). In November 2010 the city adopted the Three Corridors Specific Plan, which is intended to facilitate revitalization along these corridors and implement the General Plan by further refining the objectives for these three areas (City of Pinole, 2010b).

### *City of Hercules*

The *Hercules General Plan* was adopted in 1998. It describes the city's explosive growth between 1974 and 1993, during which time the city evolved from a company town with 150 residents in 1974 to a modern suburban community of 18,618 in 1993. According to the General Plan, the city had an estimated 18,900 residents in 1995, based on California Department of Finance estimates, and about 2,430 jobs in 1990, based on ABAG estimates. The *City of Hercules Housing Element*, adopted in 2003, notes that the city's population increased by 16 percent between 1990 and 2000, to a population of 19,488 in 2000. The housing element cites ABAG's *Projections 2000* forecast that the city will grow to a population of 23,500 by 2010 and 27,500 by 2020. The land use element describes the residential portion of the city as largely developed while much of the land designated for commercial development and employment centers remain vacant. The land use element states that the number of jobs in the city could grow to 18,575 consistent with proposed changes to the land use and circulation elements of the General Plan.

The General Plan land use element identifies opportunities for retail development on land near the junction of Interstate 80 and State Route 4; new businesses on vacant property between identified commercial areas; and a limited amount of residential development on vacant lands.

### *Contra Costa County*

The *Contra Costa County General Plan 2005-2020* was adopted in January 2005. The county General Plan governs land use of unincorporated areas of the county, including unincorporated communities within the project area. Citing ABAG's *Projections 2002* the General Plan indicates that the county as a whole (including incorporated cities) is projected to grow from a population of 948,816 in 2000 to 1,128,800 in 2020, a 19 percent increase (Contra Costa County, 2005).

For many issues, including past population growth and future trends, the General Plan considers the county in three sections: East County, Central County, and West County. The service area of the West of Hills Northern Pipelines Project is located within the West County section, which includes the cities of El Cerrito, Hercules, Pinole, Richmond and San Pablo plus the unincorporated urbanized communities of El Sobrante, Bay View-Montalvin Manor, East Richmond Heights, Kensington, North Richmond, Rodeo, Crockett, Tara Hills and Port Costa. The General Plan describes this part of the county as having a wide variety of land uses, although residential land uses predominate; about 10 percent of developed land is in commercial land uses. West County (including the incorporated cities) had a population of 226,000 in 1990 and 241,042 in 2000 (Contra Costa County, 2005). According to the General Plan Housing Element, adopted in 2009, the population of the unincorporated areas of West County was 50,337 in 2000 and was projected to grow from an estimated population of 53,634 in 2010 to 54,682 in 2020 (Contra Costa County 2009), a 2 percent increase over this ten year period.

Regarding anticipated residential development in the West County area, the General Plan anticipates that hundreds of acres of vacant industrial land in the North Richmond area will be developed or redeveloped during the planning period, because the area is expected to be more attractive to developers since flood control and expressway projects have been completed.

## Summary

The growth assumptions of the 2040 Demand Study are consistent with the growth policies and expectations presented in the general plans of the communities served by the proposed Project. The Demand Study was informed by a review of area land use plans and consultation with local planning agencies. Examples include plans for substantial development and density increases in downtown Berkeley and development and redevelopment of underutilized areas in Richmond, which corroborate information presented in the Demand Study. In general, and consistent with information presented in the Demand Study, the review of general plans indicates that most of the cities that would be served by the Project are essentially developed and are planning to accommodate future growth primarily through infill development and redevelopment at higher densities, focusing much of the new, higher-density development in certain areas such as downtown urban cores, near transit stations, and along key transit corridors.

## Conclusions

The results of the land-use based methodology used to forecast District water demands cannot be compared directly with demographic metrics included in ABAG projections and general plans, such as population, housing, and job forecasts. In addition, because the boundaries of the demand model regions do not coincide with jurisdictional boundaries, it is only possible to make a general comparative assessment of growth rates. These issues notwithstanding, the following conclusions are based on the analysis presented in the preceding sections:

- **The differences between EBMUD demand forecasts and regional projections prepared by ABAG are insignificant for the purposes of this analysis.** The average annual population growth rate reflected in the ABAG forecasts for cites in the area served by the proposed Project (0.9 percent) is substantially higher than the average annual rate reflected in EBMUD's demand projections (0.4 percent). However, the water demand projections (even if they had been based primarily on population projections) would be expected to increase at a lower rate than would population alone, since future water demand would be partly offset by the effects of conservation programs and the use of recycled water. In addition, because EBMUD's demand projections are based on projected changes in land use type and/or intensity, they incorporate factors besides population, including differing use levels for different land use categories. The demand model regions projecting the greatest demand increases (GC and GN) include all or most of two large Project area cities, Oakland (in region GC) and Richmond (in Region GN), which ABAG also projects will experience the most growth of the cities in the Project area over the planning period. Region GC also includes central Berkeley which the Demand Study notes is expected to grow substantially and which ABAG projects will have the third greatest population increase (after Oakland and Richmond) of the cities in the project area.[23] Together, these factors indicate general consistency between the ABAG projections and EBMUD 2040 Demand Study forecasts. As the comparison of growth projections indicates, the growth reflected in EBMUD's 2040 Demand Study is not greater than (and therefore would not induce growth beyond) the growth planned for by the regional planning agency in the area served by the proposed Project.

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[23] It should be noted that according to the 2040 Demand Study, growth in Region GC was expected to be largely driven by development in Oakland and Alameda. Except for a small part of northern Oakland, these cities are south of the area served by the Project. Therefore, while EBMUD provides water service to these cities, they would not be served by the proposed West of Hills Northern Pipelines Project.

- **EBMUD forecasts are generally consistent with growth forecasted by local land use agencies.** As discussed in Section 6.2.1, above, the 2040 Demand Study projections are predicated on growth allowed for in the adopted general plans in EBMUD's service area, based on analysis by the Demand Study authors in consultation with the local planning agencies. Therefore, by design, the demand projections would be expected to be consistent with growth allowed for in jurisdictions' adopted land use plans. Because EBMUD did not use specific population or housing projections to develop its demand estimates, however, it is not possible to confirm the consistency of demand projections through direct comparison of assumptions regarding these factors. In addition, because the demand model regions delineated for the Demand Study do not coincide with jurisdictional boundaries, average annual rates of growth provide only general basis for comparing anticipated growth. As shown in Table 6-5, the average annual increase in demand reflected in the Demand Study is about the same as average annual population growth rate indicated in half of the cities in the project area, is greater than planned population growth in one city and unincorporated West County, and is substantially less than the population growth rate indicated in the general plans of the cities projected to growth the fastest: Oakland, Richmond, and Hercules. Given that Oakland and Richmond are also two of the three largest cities in the project area, their relatively fast growth rates account for a substantial component of overall growth of the cities served, at least in part, by the proposed Project. Considered together, population growth forecasted in the jurisdictions' general plans is expected to occur at a somewhat faster rate than the projected to increase in water demand. This would be expected since a portion of demand would be reduced by conservation programs and use of recycled water. The demand model regions projecting the greatest demand increases (GC and GN) include all or most of Oakland and Richmond, respectively. Qualitatively, expectations regarding growth indicated in the Demand Study are consistent with information on trends, policies, and growth expectations contained in the jurisdictions' general plans. However, as the Demand Study indicates, it was prepared during a time of economic expansion, and information about the phasing of development provided by local planning agencies reflected expectations at the time. Given the prolong recession that followed, actual growth is likely to occur somewhat more slowing than the Demand Study projections indicate.

It is also important to consider that the approved planning documents of the respective jurisdictions that EBMUD's land-use-based methodology relies on have already been subjected to environmental review under CEQA. In adopting the applicable general and specific plans, the local decision-making bodies have adopted measures to mitigate adverse impacts associated with the growth that will occur under the plans and have adopted statements of overriding considerations associated with impacts that cannot be reduced to an insignificant level.

# 6.3 Impacts and Mitigation Measures: Secondary Effects of Growth

### Impact G-1: Secondary effects of planned growth.

Project implementation would support planned growth in the area served by the West of Hills Northern Pipelines Project due to the project's capacity increase. Planned growth would in turn result in indirect effects. The amount of growth that would be supported by the Project is consistent with regional growth projections. Nonetheless, consistent with the CEQA Guidelines, the Project could indirectly contribute to potentially significant secondary effects by removing a potential obstacle to projected development. Some of these secondary effects of planned growth have been identified in CEQA documents prepared by land use agencies as significant and unavoidable, while others have been identified as significant but mitigable. Significant unavoidable impacts that could occur as a result of planned growth include: loss of open space, traffic increases, degradation of air quality, and change in the visual character of the region.

The following environmental documents for city and county general plans were reviewed in order to identify the significant impacts associated with planned growth in the area:

- City of Albany: *Albany General Plan Update and Revision Program Draft Environmental Impact Report and Final Environmental Impact Report: Response to Comments,* State Clearinghouse # 89022809, September 1992b (City of Albany, 1992b)
- City of Berkeley: *City of Berkeley Draft General Plan Final Environmental Impact Report*, State Clearinghouse # 2000102107, June 2001 (City of Berkeley, 2001)
- City of El Cerrito: *City of El Cerrito General Plan Housing Element Initial Study* (City of El Cerrito, 2012b
- City of Hercules: *City of Hercules General Plan Land Use and Circulation Elements Update and Redevelopment Plan Amendments Environmental Impact Report*, (City of Hercules, 1995)
- City of Pinole: *City of Pinole General Plan Update Draft and Final Environmental Impact Report* (City of Pinole, 2010c)
- City of Richmond: *Richmond General Plan Update Final Environmental Impact Report*, (City of Richmond, 2011)
- City of San Pablo: *San Pablo General Plan 2030 Draft and Final Environmental Impact Report* (City of San Pablo, 2011b)
- Contra Costa County: *Findings Related to Certification of the Environmental Impact Report for the General Plan and Adoption of the General Plan* (Contra Costa County, 1991), and Notice of Determination, Negative Declaration prepared for Reconsolidation of the Contra Costa County General Plan (Contra Costa County, 2005)

Copies of these documents are available for review at the respective city and county planning departments.

### Authority to Mitigate Effects of Growth

As described in Section 6.1.3, EBMUD, as a utility district, does not have the authority to make land use decisions or to approve growth. The authority to regulate growth, and by extension to mitigate the environmental effects of growth, resides primarily with land use planning agencies. **Table 6-6** identifies agencies with the authority to implement measures to avoid or mitigate the environmental impacts of growth in the area served by the proposed Project; the agencies generally fall into two categories, as discussed below.

- Agencies with primary authority over land use planning and CEQA lead agency status for approval of land us plans, permits and other approvals.
- Agencies responsible for stewardship of environmental resources.

**TABLE 6-6**
**AGENCIES WITH THE AUTHORITY TO IMPLEMENT OR REQUIRE IMPLEMENTATION OF MEASURES TO AVOID OR MITIGATE GROWTH-RELATED IMPACTS**

| Agency | Authority |
|---|---|
| Planning Agencies | |
| Cities within the Area Served by Project | ***Planning and Enforcement.*** Responsible for planning, land use, and environmental protection of the area within the city's jurisdictional boundaries and adoption of the general plan governing this area. Responsible for enforcing city environmental policies through zoning and building codes and ordinances. |
| | ***CEQA.*** Cities typically act as the lead agency for CEQA compliance for development projects in incorporated areas; as such they bear responsibility for adopting measures to mitigate the project's significant direct and indirect impacts on the environment and programs to ensure that mitigation measures are successfully implemented. |
| Contra Costa County | ***Planning and Enforcement.*** Responsible for planning, land use, and environmental protection of unincorporated areas and adoption of the general plan governing unincorporated county lands. Responsible for enforcing County environmental policies through zoning and building codes and ordinances. |
| | ***CEQA.*** Counties typically act as the lead agency for CEQA compliance for development projects in unincorporated areas; as such they bear responsibility for adopting measures to mitigate the project's significant direct and indirect impacts on the environment and programs to ensure that mitigation measures are successfully implemented. |
| Association of Bay Area Governments and Metropolitan Transportation Commission | Tasked with creating a "Sustainable Community Strategy" for the nine-county Bay Area through integrated land use and transportation planning, and demonstrating ability to attain the proposed reduction targets. |
| Local Agency Formation Commission | Empowered to approve or disapprove all proposals to incorporate cities, to form special districts, or to annex territories to cities or special districts. Also empowered to guide growth of governmental service responsibilities. |
| San Francisco Bay Conservation and Development Commission | A state agency responsible for regulating development adjacent to San Francisco Bay. Under the federal Coastal Zone Management Act, exercises federal consistency review authority over all federal activities and federally licensed, permitted or assisted activities that affect resources within the San Francisco Bay segment of the California coastal zone. |
| U.S. Environmental Protection Agency | Responsible for writing regulations and setting national standards to implement a variety of federal environmental protection and human health laws. In California, EPA has delegated much of the authority to enforce the Clean Air Act, Clean Water Act and Drinking Water Quality Act to state agencies while retaining some oversight. EPA also comments on the environmental review of projects through its participation in the National Environmental Policy Act process. |
| Water Resources | |
| State Water Resources Control Board (SWRCB)[a] | Shares responsibility with the regional water quality control boards (RWQCBs) to protect and restore water quality; approves regional basin plans; provides administrative and other support to regional boards; and administers surface water rights. Develops water quality control plans and polices in certain instances where water quality issues cross regional boundaries or have statewide application. |
| San Francisco Bay RWQCB | Shares responsibility with SWRCB to protect and restore water quality. Formulates and adopts water quality control plans. Implements portions of the Clean Water Act when EPA and SWRCB delegate authority, as is the case with issuance of NPDES permits for waste discharge, reclamation, and storm water drainage. |
| California Department of Public Health | Responsible for the purity and potability of domestic water supplies. Assists SWRCB, RWQCBs in setting quality standards. |

**TABLE 6-6 (Continued)**
**AGENCIES WITH THE AUTHORITY TO IMPLEMENT OR REQUIRE IMPLEMENTATION OF MEASURES TO AVOID OR MITIGATE GROWTH-RELATED IMPACTS**

| Agency | Authority |
|---|---|
| Air Resources | |
| California Air Resources Board[a] | Responsible for adopting and enforcing standards, rules, and regulations for the control of air pollution from mobile sources throughout the state. Also responsible for developing plans and regional reduction targets for greenhouse gas emissions. |
| Bay Area Air Quality Management District (BAAQMD) | Adopts and enforces local regulations governing stationary sources of air pollutants for the San Francisco Bay Area. Issues Authority to Construct Permits and Permits to Operate. Provides compliance inspections of facilities and monitors regional air quality. Develops Clean Air Plans in compliance with the Clean Air Act. Publish guidelines to guide lead agencies in evaluating and mitigating air quality impacts. |
| Biological Resources | |
| National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS) | Requires consultation under Section 7 or Section 10 of the Endangered Species Act for projects which could potentially impact endangered or threatened species under the purview of National Marine Fisheries Service. Prepares biological opinions on the status of species in specific areas and potential effects of proposed projects. Approves reasonable and prudent measures to reduce impacts and establishes Habitat Conservation Plans. |
| U.S. Fish and Wildlife Service (USFWS) | Requires consultation under Section 7 or Section 10 of the Endangered Species Act for projects which could potentially impact endangered or threatened species. Prepares biological opinions on the status of species in specific areas and potential effects of proposed projects. Approves reasonable and prudent measures to reduce impacts and establishes Habitat Conservation Plans. |
| U.S. Army Corps of Engineers | Issues permits to dredge or place fill in waters of the United States, including wetlands, pursuant to the Clean Water Act. Required to consult with USFWS and NMFS regarding compliance with the federal Endangered Species Act. |
| California Department of Fish and Game | Issues Stream Bed Alteration Agreements for projects potentially impacting waterways. Issues incidental take permits for projects that would result in the take of species listed the California Endangered Species Act if specific criteria are met. Under the Natural Community Conservation Planning Act, provides oversight for the development of regional Natural Community Conservation Plans which aim to balance ecosystem protection and land use. |

[a] These agencies fall under the umbrella of the California Environmental Protection Agency

SOURCE: ESA

**Implementation of Environmental Protection Measures by Land Use Planning Agencies.** Cities and counties (for unincorporated areas) have the greatest authority over land use decisions within their jurisdictions through implementation of their general plans, locally adopted ordinances and regulations to manage growth, and development approval processes. Some ordinances and policies adopted at the local level (e.g., ordinances establishing urban growth limit lines, protecting natural resources such as riparian habitat, or establishing resource conservation easements) are intended to avoid or reduce environmental impacts.

In their capacities as lead agencies under CEQA (PRC Section 21002 and Section 21067), cities and counties also have the authority and responsibility to evaluate the environmental impacts that would result from implementation of plans and individual development projects within their jurisdictions, and to adopt measures to mitigate any significant adverse impacts. Cities and counties are required to identify mitigation measures in the CEQA documents on these plans and projects, and to adopt feasible measures within their authority, as well as programs to monitor and report on their implementation, as conditions of approval.

**Implementation of Environmental Protection Measures by Resource Management Agencies.** Mitigation of impacts relating to specific resources categories generally falls under the responsibility of resource-specific agencies at the federal, state, and regional levels through permitting and related regulatory processes summarized in Table 6-6. Through their permitting authority these agencies mitigate the impacts of proposed land uses and enforce the provisions of adopted resource protection plans (e.g., water basin plans and air basin plans). For example, the San Francisco Bay Regional Water Quality Control Board identifies specific requirements and water quality standards for facilities through issuance of waste discharge requirements and the Bay Area Air Quality Management District mitigates the effects of pollutant emissions through issuance of permits to construct and operate stationary sources of air emissions.

**Conclusion: *Significant and Unavoidable*.** The West of Hills Northern Pipelines Project would not *directly* contribute to the creation of additional housing or jobs within the area it serves as it is limited to upgrading water infrastructure and capacity. However, the Project would *indirectly* support growth by removing obstacles to growth enabling growth under the approved general plans within the area served by the Project.

The cities and county in the area served by the Project have the authority to approve or deny development projects and to impose mitigation to address significant environmental impacts associated with development projects within their respective jurisdictions. In addition, numerous federal, state, regional and local agencies are specifically charged with protecting environmental resources, and ensuring that planned development occurs in a sustainable manner. Together, these agencies exercise the authority to reduce the effects of development on the environment; however, some unavoidable impacts would still be expected to occur.

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# CHAPTER 7
# Significant and Unavoidable Impacts and Irreversible Environmental Changes

## 7.1 Significant Environmental Effects that Cannot be Avoided if the Proposed Project is Implemented

In accordance with Section 21067 of CEQA, and with Sections 15126(b) and 15126.2(b) of the CEQA Guidelines, this section identifies Project impacts that, even with the implementation of all identified mitigation measures, would remain significant, and are therefore considered *unavoidable.* EBMUD will be required to adopt Findings and prepare a Statement of Overriding Considerations for unavoidable, adverse impacts as part of its approval of the EIR. The analyses presented in Chapter 5, Environmental Setting, Impacts, and Mitigation Measures of this EIR indicate implementation of the proposed Project would result in the following significant unavoidable impacts:

- ***Aesthetics*** *(Central Pressure Zone Pipeline (Richmond/San Pablo).* The pipe bridge across San Pablo Creek at the optional location adjacent to San Pablo Avenue would partially obstruct views of San Pablo Creek and the adjacent vegetated banks and would result in a significant and unavoidable impact to visual character of the area. The City of San Pablo is considering replacing the existing walkway which would allow construction of the pipeline beneath the walkway, reducing visual impacts. However, due to the uncertainty in coordinating these two projects, it is not clear that this option is feasible. As a result, the impact of this optional alignment is considered *significant and unavoidable* (Impact 3.2-4).

- ***Noise*** *(all pipelines)*. Estimated construction noise levels would exceed both the daytime noise limits specified in the cities of Berkeley and Richmond noise ordinances. If nighttime construction is required at tie-in locations or at intersections, nighttime noise limits specified in the cities of Berkeley and Richmond noise ordinances would be exceeded (Impact 3.11-1). Nighttime Construction activity would result in temporary noise increases that would exceed speech interference and sleep disturbance thresholds at nearby noise-sensitive land uses (Impact 3.11-2). Contribution to cumulative noise impacts (Impact C-10). Even with implementation of time limits, administrative controls and source controls, these impacts would remain *significant and unavoidable.*

- ***Transportation.*** Construction of the pipelines would require the closure of streets and detouring of traffic which would result in temporary adverse effects on the transportation system. Even with implementation of mitigation measures such as temporary traffic signals and flaggers these impacts would remain significant:

- *Wildcat Pipeline (El Cerrito)* – Unacceptable operating conditions at the following intersections along the Project alignment: San Pablo Avenue/Potrero Avenue and Richmond Street/Fairmount Avenue (Impact 3.13-1). Contribution to cumulative traffic impacts (Impact C-12).
- *Central Pressure Zone Pipeline (El Cerrito/Richmond)* – Unacceptable operating conditions at the following intersections along San Pablo Avenue: Macdonald Avenue (p.m. peak period only), Cutting Boulevard, Eastshore Boulevard/Hill Street, Potrero Avenue, Moeser Lane, Central Avenue, and Fairmount Avenue (Impact 3.13-1). Contribution to cumulative traffic impacts (Impact C-12).
- *Central Pressure Zone Pipeline (El Cerrito/Richmond)* – Limited access to businesses within the area of construction along San Pablo Avenue during work hours (Impact 3.13-4).
- *Central Pressure Zone Pipeline (El Cerrito/Richmond)* - Transit times would be adversely affected and several bus stops would need to be closed along AC Transit Lines 72, 72M, 667, 668 and 800 (Impact 3.13-5).

- ***Growth*** *(all pipelines).* The proposed pipelines have been sized to meet projected future increases in water demand. Accordingly, while the proposed Project would not *directly* contribute to the creation of additional housing or jobs, the Project would *indirectly* support growth by removing an obstacle to growth and enabling growth under the approved general plans within the area served by the Project. EBMUD, as a utility district, does not have the authority to make land use decisions or to approve growth. The authority to regulate growth, and by extension to mitigate the environmental effects of growth, resides primarily with land use planning agencies (e.g. cities and counties). These agencies exercise the authority to reduce the effects of development on the environment; however, some unavoidable impacts would still be expected to occur (Impact G-1).

## 7.2 Significant Irreversible Environmental Changes

In accordance with CEQA Section 21100(b)(2)(B) and CEQA Guidelines Sections 15126(c) and 15126.2(c), this section identifies significant irreversible environmental changes that would be caused by the proposed Project.

Implementation of the proposed Project would require irreversible commitment of natural resources including construction materials; labor; and energy required for construction, operation, and maintenance. Commitment of non-renewable natural resources used in construction would include gravel, petroleum products, steel, and other materials. Commitment of energy resources for construction would include fuel oil, natural gas, and gasoline for heavy machinery.

Operation of the proposed Project would require a commitment of energy for pumping, however the proposed Project would improve the overall efficiency of pumping plants serving the West of Hills area. The proposed Project would also require a small commitment of energy and fuel for routine and emergency maintenance activities.

# CHAPTER 8
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