3.9 Air Quality

3.9.1 Approach to Analysis

The air quality impact analysis considers construction and operational impacts associated with the proposed WTTIP. Construction air emissions are evaluated in accordance with the Bay Area Air Quality Management District's *BAAQMD CEQA Guidelines* (BAAQMD, 1999). Operational emissions are discussed qualitatively.

3.9.2 Setting

Meteorology

Temperatures in Lafayette, Moraga, Orinda, and western Walnut Creek (hereafter referred to as the Lamorinda/Walnut Creek area) average 58 degrees Fahrenheit annually, with summer highs in the mid-80s and winter lows in the mid-30s. In Oakland, highs are about 10 degrees cooler and lows are about 10 degrees warmer. The rapid modification of coastal marine air as it moves inland results in temperatures that are about 15 degrees warmer in the Lamorinda/Walnut Creek area than in the Oakland/El Sobrante areas on summer afternoons, and about 10 degrees colder on winter mornings. While the coastal hills create sharp contrasts in temperature within short distances, precipitation is more uniformly distributed and averages about 20 inches per year throughout much of the Bay Area. Annual precipitation varies markedly from year to year. Thus, the rainfall total in one month of a heavy-precipitation year may exceed that of an entire annual total during a drought condition.

Winds are an important element in characterizing the air quality impact of any project. Wind controls both the microscale dispersion of any locally generated air emissions as well as their regional trajectory. Winds in the Oakland and El Sobrante areas are typically out of the west, west-northwest, and northwest (about 50 percent of the time), averaging nine miles per hour. Winds in the Lamorinda/Walnut Creek area are rather complex, because the prevailing onshore winds are southwest to west while the valley topography runs mainly northwest to southeast. During the day, localized emissions are funneled in a southeastward direction. At night, emissions are less readily ventilated and travel in more random directions. During the daytime, when the winds travel at an average speed of about eight miles per hour, there is usually little potential for large-scale stagnation. However, about one-third of the time winds at night are less than two to three miles per hour. Local radiation temperature inversions during the night (when the ground is cooler than the air) can combine with these light winds to create localized air stagnation near major air pollution emissions sources (e.g., freeways).

Air Quality Regulations

The 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 California, there is considerable diversity between the state and national ambient air quality standards, as shown in Table 3.9-1. California ambient standards tend to be at least as protective as national ambient standards and are often more stringent.

The ambient air quality standards are intended to protect the public health and welfare, and they specify the concentration of pollutants (with an adequate margin of safety) to which the public can be exposed without adverse health effects. They are designed to protect those segments of the public most susceptible to respiratory distress, known as sensitive receptors, including asthmatics, 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 that are somewhat above the ambient air quality standards before adverse health effects are observed.

Federal Standards

The 1977 Clean Air Act (last amended in 1990, 42 United States Code [USC] 7401 et seq.) required 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 will be controlled in order to achieve all standards within the deadlines specified in the 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 the *Bay Area Air Quality Plan* in 1982, which predicted attainment of the federal clean air standards within the 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 plan, which is referred to as the State Implementation Plan (SIP), must contain control strategies that demonstrate attainment of national ambient air quality standards by deadlines established in the federal Clean Air Act.

The Bay Area Air Basin's current attainment status with respect to federal standards is summarized in Table 3.9-1. In general, the Bay Area experiences low concentrations of most pollutants when compared to federal standards, except for ozone and particulate matter (PM_{10} and $PM_{2.5}$), for which standards are exceeded periodically. The Bay Area's attainment status for ozone has changed several times over the past decade, first from "nonattainment" to "attainment" in 1995, then back to "unclassified nonattainment" in 1998 for the 1-hour federal ozone standard. In June 2004, the Bay Area was designated as "marginal nonattainment" for the 8-hour ozone standard. In 1998, after many years without violations of any carbon monoxide (CO) standards, the attainment status for CO was upgraded to "attainment."

In response to the U.S. Environmental Protection Agency's (U.S. EPA) redesignation of the basin for the 1-hour federal ozone standard to nonattainment, the BAAQMD, ABAG, and MTC were required to develop an ozone attainment plan to meet this standard. The *1999 Ozone Attainment Plan* (OAP) was prepared and adopted by these agencies in June 1999. However, in March 2001, the U.S. EPA proposed and took final action to approve portions of the 1999 OAP and disapprove

TABLE 3.9-1
STATE AND FEDERAL AMBIENT AIR QUALITY STANDARDS AND ATTAINMENT STATUS

		(State) SAAQS[a]		(Federal) NAAQS[b]	
Pollutant	**Averaging Time**	**Standard**	**Attainment Status**	**Standard**	**Attainment Status**
Ozone (O3)	1-hour	0.09 ppm	**N**	NA	See Note (c)
	8-hour	0.07 ppm	See Note (d)	0.08 ppm	**N**
Carbon Monoxide (CO)	1 hour	20 ppm	A	35 ppm	A
	8 hour	9.0 ppm	A	9 ppm	A
Nitrogen Dioxide (NO_2)	1 hour	0.25 ppm	A	NA	NA
	Annual	NA	NA	0.053 ppm	A
Sulfur Dioxide (SO_2)	1 hour	0.25 ppm	A	NA	NA
	24 hour	0.04 ppm	A	0.14 ppm	A
	Annual	NA	NA	0.03 ppm	A
Particulate Matter (PM_{10})	24 hour	50 µg/m^3	**N**	150 µg/m^3	U
	Annual[e]	20 µg/m^3	**N**	50 µg/m^3	A
Fine Particulate Matter ($PM_{2.5}$)	24 hour	NA	NA	65 µg/m^3	A
	Annual	12 µg/m^3	**N**	15 µg/m^3	A
Sulfates	24 hour	25 µg/m^3	A	NA	NA
Lead	30 day	1.5 µg/m^3	A	NA	NA
	Quarter	NA	NA	1.5 µg/m^3	A
Hydrogen Sulfide	1 hour	0.03 ppm	U	NA	NA
Visibility-Reducing Particles	8 hour	See Note (f)	A	NA	NA

NOTES: A = Attainment; **N** = Nonattainment; U = Unclassified; NA = Not Applicable or no applicable standard; ppm = parts per million; µg/m^3 = micrograms per cubic meter.

a SAAQS = state ambient air quality standards (California). SAAQS for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, particulate matter, and visibility-reducing particles are values that are not to be exceeded. All other state standards shown are values not to be equaled or exceeded.

b NAAQS = national ambient air quality standards. NAAQS, other than 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 0.08 ppm or less. The 24-hour PM10 standard is attained when the three-year average of the 99th percentile of monitored concentrations is less than the standard. The 24-hour PM2.5 standard is attained when the three-year average of 98th percentile is less than the standard.

c The national 1-hour ozone standard was revoked by the U.S. EPA on June 15, 2005.

d This state standard was approved in April 2005 and is expected to become effective in 2006.

e State standard = annual geometric mean; national standard = annual arithmetic mean.

f Statewide visibility-reducing particle standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

SOURCE: BAAQMD, 2005a.

other portions, while also making the finding that the Bay Area had not attained the national 1-hour ozone standard. As a result, a revised OAP was prepared and adopted in October 2001. The 2001 plan amends and supplements the 1999 plan and provides for attainment by 2006, the attainment deadline. In June 2005, the federal 1-hour ozone standard was revoked by the U.S. EPA, although the 8-hour standard is still in effect.

The 2001 OAP contains control strategies for stationary and mobile sources. The adopted mobile-source control program was estimated to significantly reduce volatile organic compound (VOC) and nitrogen oxide (NOx) emissions between 2000 and 2006, reducing emissions from on- and off-road diesel engines (including construction equipment). In addition to emission reduction requirements for engines and fuels, the OAP identified 28 transportation control measures to reduce automobile emissions, including improved transit service and transit coordination, new carpool lanes, signal timing, freeway incident management, and increased state gas tax and bridge tolls.

State Standards

In 1988, California passed the California Clean Air Act (California Health and Safety Code Sections 39600 et seq.), which, like its federal counterpart, called for the designation of areas as attainment or nonattainment, based on state ambient air quality standards rather than the federal standards. The Bay Area Air Basin attainment status with respect to state standards is summarized in Table 3.9-1. As shown in the table, the Bay Area experiences low concentrations of most pollutants when compared to state standards, except for ozone, PM_{10}, and $PM_{2.5}$, for which standards are exceeded periodically.

California Air Resources Board

The California Air Resources Board (CARB) is the state agency responsible for regulating air quality. The CARB's responsibilities include establishing state ambient air quality standards, emissions standards, and regulations for mobile emissions sources (e.g., autos, trucks, etc.), and overseeing the efforts of countywide and multi-county air pollution control districts, which have primary responsibility over stationary sources. The emission standards most relevant to the WTTIP are those related to automobiles and on- and off-road heavy-duty diesel engines. The CARB also regulates vehicle fuels with the intent to reduce emissions; it has set emission reduction performance requirements for gasoline (California reformulated gasoline) and limited the sulfur and aromatic content of diesel fuel to make it burn cleaner. The CARB also sets the standards used to pass or fail vehicles in smog-check and heavy-duty truck inspection programs.

In 2005, the 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 relevant changes with respect to the WTTIP are Sections 2480 and 2485. The pertinent requirements of Section 2480, Airborne Toxic Control Measure to Limit School Bus Idling and Idling at Schools, include the following:

> (c)(2) A driver of a commercial motor vehicle:
>
> (A) must turn off the bus or vehicle engine upon stopping at a school and must not turn the bus or vehicle engine on more than 30 seconds before beginning to depart from a school; and
>
> (B) must not cause or allow a bus or vehicle to idle at any location within 100 feet of, but not at, a school for:

(i) more than five consecutive minutes; or

(ii) a period or periods aggregating more than five minutes in any one hour.

(c)(4) A motor carrier of a commercial motor vehicle must ensure that:

(A) the bus or vehicle driver, upon employment and at least once per year thereafter, is informed of the requirements in (c)(2), and of the consequences, under this section and the motor carrier's terms of employment, of not complying with those requirements;

(B) all complaints of non-compliance with, and enforcement actions related to, the requirements of (c)(2) are reviewed and remedial action is taken as necessary; and

(C) records of (4) (A) and (B) are kept for at least three years and made available or accessible to enforcement personnel as defined in subsection (g) within three business days of their request.

Pertinent requirements of Section 2485, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling, include the following:

(c) The driver of any vehicle subject to this section:

(1) shall not idle the vehicle's primary diesel engine for greater than five minutes at any location, except as noted in subsection (d); and

(2) shall not operate a diesel-fueled auxiliary power system (APS) to power a heater, air conditioner, or any ancillary equipment on that vehicle during sleeping or resting in a sleeper berth for greater than five minutes at any location when within 100 feet of a restricted area, except as noted in subsection (d).

"Restricted area" means any real property zoned for individual or multifamily housing units that has one or more such units. There are 12 exceptions to this requirement (e.g., emergency situations, military, adverse weather conditions, etc.), including: when a vehicle's power takeoff is being used to run pumps, blowers, or other equipment; when a vehicle is stuck in traffic, stopped at a light, or under direction of a police officer; when a vehicle is queuing beyond 100 feet from any restricted area; or when an engine is being tested, serviced, or repaired.

Bay Area Air Quality Management District

The BAAQMD is the regional agency responsible for air quality regulation within the San Francisco Bay Area Air Basin. The BAAQMD regulates air quality through its planning and review activities. The BAAQMD has permit authority over most types of stationary emission sources and 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. The BAAQMD regulates new or expanding stationary sources of toxic air contaminants.

The BAAQMD's *Clean Air Plan* (CAP), last adopted in 2000, applies control measures to stationary and mobile sources and outlines transportation control measures. Although the 2000 CAP is an ozone plan, it includes PM_{10} attainment planning as an informational item. The 1997 CAP and 2000 CAP included 19 transportation control measures, many of which were partially implemented during 1998 to 2000. The 2000 CAP continues to implement and expand key mobile-source programs included in the 1997 CAP.

In September 2005, the BAAQMD, in cooperation with the MTC and ABAG, prepared the *Bay Area 2005 Ozone Strategy*. The draft Ozone Strategy is a roadmap showing how the San Francisco Bay Area will achieve compliance with the state 1-hour ozone standard as expeditiously as practicable, and how the region will reduce transport of ozone and ozone precursors to neighboring air basins. The draft Ozone Strategy describes how the Bay Area will fulfill California Clean Air Act planning requirements for the state 1-hour ozone standard through the proposed control strategy. The control strategy includes stationary-source control measures to be implemented through BAAQMD regulations; mobile-source control measures to be implemented through incentive programs and other activities; and transportation control measures to be implemented through transportation programs in cooperation with the MTC, local governments, transit agencies, and others.

Ambient Air Quality

The BAAQMD operates a regional monitoring network that measures the ambient concentrations of six criteria air pollutants: ozone, CO, particulate matter (PM_{10} and $PM_{2.5}$), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead. Existing and probable future air quality in the Lamorinda area can be generally inferred from ambient air quality measurements conducted by the BAAQMD at its closest monitoring stations in Oakland and Concord. Table 3.9-2 is a six-year summary of monitoring data (1999–2004) from the BAAQMD's Oakland and Concord stations. Data from the Concord station are included because the Oakland monitoring station does not monitor NO_x, SO_2, PM_{10}, or $PM_{2.5}$ concentrations. Final data for 2005 are not yet available. Table 3.9-2 compares measured pollutant concentrations with state ambient air quality standards, which are more stringent than the corresponding federal standards.

Ozone

Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and 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. Ozone 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, 1999). Table 3.9-2 shows that, according to published data, the more stringent applicable standards (the state 1-hour standard of 0.09 parts per million [ppm] and the federal 8-hour standard of 0.8 ppm) have not been exceeded during the last six years.

TABLE 3.9-2
OAKLAND AND CONCORD AMBIENT AIR QUALITY MONITORING SUMMARY
(1999–2004)

Monitoring Station & Pollutant	Most Stringent Applicable Standard	Number of Days Standards were Exceeded and Maximum Concentrations Measured					
		1999	2000	2001	2002	2003	2004
Downtown Oakland Data							
Ozone (ROG)							
Days 1-hour standard exceeded	>0.09 ppm[a]	0	0	0	0	0	0
Maximum 1-hour concentration (ppm)[b]		0.08	0.07	0.07	0.05	0.08	0.08
Days 8-hour standard exceeded	>0.08 ppm[b]	0	0	0	0	0	0
Maximum 8-hour concentration (ppm)[b]		0.06	0.05	0.04	0.04	0.05	0.06
Carbon monoxide							
Days 1-hour standard exceeded	>20. ppm[a]	0	0	0	0	0	0
Maximum 1-hour concentration (ppm)		6.4	5.4	5.0	4.4	3.9	3.5
Days 8-hour standard exceeded	>9. ppm[a]	0	0	0	0	0	0
Maximum 8-hour concentration (ppm)		5.2	3.4	4.0	3.3	2.8	2.6
Concord Data							
Suspended particulates (PM10)							
Maximum 24-hour concentration (µg/m^3)		**64**	**54**	**106**	**63**	34	**51**
Days 24-hour standard exceeded[c]	>50 µg/m^3[a]	3	1	2	3	0	1
Suspended particulates (PM2.5)							
Maximum 24-hour concentration (µg/m^3)		57	53	**68**	**77**	50	**74**
Days 24-hour standard exceeded	>65 µg/m^3[b]	0	0	1	1	0	1
Annual average (µg/m^3)	>12 µg/m^3[a]	NA	NA	NA	**13.3**	9.7	10.7

NOTES: **Bold** values are in excess of applicable standard. "NA" indicates that data are not available.
ppm = parts per million; µg/m^3 = micrograms per cubic meter

[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, 2005b; CARB, 2005.

Carbon Monoxide

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 dizziness and fatigue, impair central nervous system function, and induce angina in persons with serious heart disease (BAAQMD, 1999). Table 3.9-2 shows that no exceedances of state CO standards were recorded between 1999 and 2004. Measurements of CO show low baseline levels, with the hourly maximum averaging less than 25 percent of the more stringent state standard. Similarly, maximum 8-hour CO levels average less than 40 percent of the allowable 8-hour standard.

Suspended and Inhalable Particulate Matter (PM10 and PM2.5)

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: PM10 for particles less than 10 microns in diameter, and PM2.5 for particles less than 2.5 microns in

diameter. Motor vehicles generate about half of Bay Area particulates, through tailpipe emissions as well as brake pad and tire wear. Wood burning in fireplaces and stoves, industrial facilities, and ground-disturbing activities such as construction are other sources of fine particulates. Fine particulates are small enough to be inhaled into the deepest parts of the human lung can cause adverse health effects. Among the criteria pollutants that the BAAQMD regulates, particulates appear to represent the most serious overall health hazard. Studies have shown that elevated particulate levels contribute to the death of approximately 200 to 500 people per year in the Bay Area. High levels of particulates have also been known to exacerbate chronic respiratory ailments, such as bronchitis and asthma, and have been associated with increased emergency room visits and hospital admissions (BAAQMD, 1999).

Diesel exhaust is a growing concern in the Bay Area and throughout California. The CARB identified diesel engine particulate matter as a toxic air contaminant. 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 particles, which are very small and can penetrate deeply into the lungs. Diesel engine particulate matter has been identified as a human carcinogen. Mobile sources such as trucks, buses, and automobiles are some of the primary sources of diesel emissions. Studies show that diesel particulate matter concentrations are much higher near heavily traveled highways and intersections. BAAQMD analysis shows that the cancer risk from exposure to diesel exhaust is much higher than the risk associated with any other toxic air pollutant routinely measured in the region (BAAQMD, 1999).

Table 3.9-2 shows that exceedances of the state PM_{10} standard occur relatively infrequently in Concord. The state 24-hour PM_{10} standard is estimated to have been exceeded an average of 10 days per year between 1999 and 2004. The less stringent federal 24-hour PM_{10} standard was not exceeded at the Concord monitoring station during this period. PM_{10} concentrations in the Lamorinda area are expected to be similar to those measured in Concord.

In 1997, the U.S. EPA adopted a new standard for $PM_{2.5}$, which represents the fine fraction of particulate matter (Table 3.9-1). California's standard went into effect in 2003. The BAAQMD initiated the Community Air Risk Evaluation program in 2004 with the goal of sampling ambient levels of diesel particulate matter; however, the results are not yet available. The BAAQMD began monitoring $PM_{2.5}$ concentrations in 1999; data from the Concord station for 1999 through 2004 are presented in Table 3.9-2. The federal 24-hour $PM_{2.5}$ standard was exceeded once in 2001, 2002, and 2004, for a total of three days, while the state annual average standard was exceeded in 2002.

Other Criteria Air Pollutants

The standards for NO_2, SO_2, and lead are being met in the Bay Area, and pollutant trends suggest that the air basin will continue to meet these standards for the foreseeable future.

Odors

Although odor is not generally a concern at water treatment plants, sometimes open basins associated with backwash water processing can be sources of odor. Odors can derive from organic material suspended in the water, from outgassing of dissolved gases used for disinfection, or from sludge that has been removed from the water during treatment. Other proposed WTTIP facilities would be enclosed and would handle treated water, so there would be no sources of odor.

Sensitive Receptors

Land uses such as schools, children's daycare centers, hospitals, and convalescent 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, resulting in greater exposure to ambient air quality conditions. Recreational uses or parks are also considered sensitive due to the greater exposure to ambient air quality conditions, and because the presence of pollution detracts from the recreational experience.

There are residential uses adjacent to or near all but three of the WTTIP facility sites (the Fay Hill Pumping Plant and Reservoir sites and the Highland Reservoir site), while a few of the proposed WTTIP facilities are adjacent to or near schools and parks. The northern portion of the Orinda WTP site is currently used as a sports field, and Wagner Ranch Elementary School is located to the north of this field. Campolindo High School is adjacent to the Moraga Road Pipeline alignment. The Highland Reservoir and Pipelines would be located within the Lafayette Reservoir Recreation Area, and the Lafayette WTP is to the north of this area (across Mt. Diablo Boulevard). The Walnut Creek WTP is located adjacent to the Acalanes Ridge Open Space. The Briones–Mt. Diablo Trail is adjacent to the Walnut Creek WTP site, while the Iron Horse Regional Trail is adjacent to the Leland Isolation Bypass Valves site.

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 project is considered to have a significant effect on air quality if it would:

- Violate any ambient air quality standard;
- Contribute substantially to an existing or projected air quality violation; or
- Expose sensitive receptors to substantial pollutant concentrations.

For construction-phase impacts, the BAAQMD recommends that significance be based on a consideration of the control measures to be implemented (BAAQMD, 1999). If appropriate mitigation measures are implemented to control PM_{10} emissions, the impact would be less than

significant. The *BAAQMD CEQA Guidelines* contain a list of feasible control measures for construction-related PM_{10} emissions and include significance criteria for evaluating operational-phase emissions associated with projects. In accordance with the *BAAQMD CEQA Guidelines*, a project would have a significant effect if it would:

- Cause a new increase in pollutant emissions of ROG, NOx, or PM_{10} exceeding 80 pounds per day (lbs/day); or
- Cause violations of the state ambient air quality standards for CO of 9 ppm averaged over 8 hours and 20 ppm for 1 hour, of which the potential for a violation occurs when CO levels exceed 550 lbs/day.

Any air quality impact determined to be significant under the above-described criteria would also be considered to have a significant cumulative air quality impact (BAAQMD, 1999). However, for projects having no significant operational air quality impacts, the determination of significance of cumulative impacts is based on the consistency of the project with the host jurisdiction's general plan and with the 1997 CAP.

Table 3.9-3 summarizes the significance determinations of air quality impacts identified for each WTTIP project.

Construction Impacts

Impact 3.9-1: Short-term increases in fugitive dust (including inhalable particulates) and equipment exhaust emissions during construction activities.

Fugitive Dust Emissions

Project construction would generate fugitive dust[1] (including PM_{10} and $PM_{2.5}$) and other criteria pollutants, primarily through excavation activities, construction equipment exhaust and haul truck trips, and related construction worker commute trips. This impact would be temporary and would span the duration of construction for each project, generally one to two years depending on the project (one water treatment plant project would last for four to six years). However, construction emissions associated with implementation of the WTTIP would span 12 years (2007 to 2018).

The BAAQMD does not require quantification of construction emissions, but considers any project's construction-related impacts to be adequately mitigated if BAAQMD-recommended dust-control measures are implemented. The extent of dust-control measures required by the BAAQMD depends on the size of the project. However, because of the unique characteristics of the WTTIP —the number of individual projects, the size of some of the projects, and the overall duration of construction activities—construction-phase emissions have been quantified. The BAAQMD's PM_{10} emission factor of 51 pounds per acre per day (BAAQMD, 1999) was applied to estimated earthmoving quantities (average volume per day). Table 3.9-4 shows the estimated

[1] "Fugitive" emissions generally refer to those emissions that are released to the atmosphere by some means other than through a stack or tailpipe.

TABLE 3.9-3
SUMMARY OF POTENTIAL PROJECT-LEVEL AIR QUALITY IMPACTS

Facility	Impact 3.9-1 Construction Emissions	Impact 3.9-2 Diesel Particulate Emissions Along Haul Routes	Impact 3.9-3 Tunnel-Related Emissions	Impact 3.9-4 Operational Pollutant Emissions at Treatment Facilities	Impact 3.9-5 Operational Odor Emissions	Impact 3.9-6 Secondary Emissions from Electricity Generation
Lafayette WTP						
Alternative 1	SM	LTS	–	LTS	LTS	LTS
Alternative 2	SM	LTS	–	LTS	LTS	LTS
Orinda WTP						
Alternative 1	SM	LTS	–	LTS	LTS	LTS
Alternative 2	SM	LTS	–	LTS	LTS	LTS
Walnut Creek WTP						
Alternative 1 or 2	SM	LTS	–	LTS	LTS	LTS
Sobrante WTP						
Alternative 1 or 2	SM	LTS	–	LTS	LTS	LTS
Upper San Leandro WTP						
Alternative 1 or 2	SM	LTS	–	LTS	LTS	LTS
Orinda-Lafayette Aqueduct						
Alternative 2 only	SM	LTS	SM	–	LTS	LTS
Ardith Reservoir/ Donald Pumping Plant	SM	LTS	–	–	LTS	LTS
Fay Hill Pumping Plant and Pipeline Improvements	SM	LTS	–	–	LTS	LTS
Fay Hill Reservoir	SM	LTS	–	–	LTS	LTS
Glen Pipeline Improvements	SM	LTS	–	–	LTS	LTS
Happy Valley Pumping Plant and Pipeline	SM	LTS	–	–	LTS	LTS
Highland Reservoir and Pipelines	SM	LTS	–	–	LTS	LTS
Lafayette Reclaimed Water Pipeline	SM	LTS	–	–	LTS	LTS
Leland Isolation Pipeline and Bypass Valves	SM	LTS	–	–	LTS	LTS
Moraga Reservoir	SM	LTS	–	–	LTS	LTS
Moraga Road Pipeline	SM	LTS	–	–	LTS	LTS
Sunnyside Pumping Plant	SM	LTS	–	–	LTS	LTS
Tice Pumping Plant and Pipeline	SM	LTS	–	–	LTS	LTS
Withers Pumping Plant	SM	LTS	–	–	LTS	LTS

SM = Significant Impact, Can Be Mitigated
SU = Significant Impact, Unavoidable
LTS = Less-Than-Significant Impact
– = No Impact

TABLE 3.9-4
CONSTRUCTION DUST EMISSIONS

WTTIP Project (Organized by Schedule)	Expected Timeframe of Construction	Cubic Yards of Earth Moved				Surface Disturbance (acres/day)	Daily Emissions PM_{10} (lb/day)
		Cut	Fill	Total Volume	Average/Day		
Moraga Road Pipeline	2007–2008	26,614	20,659	47,273	248	0.15	7.8
Walnut Creek WTP	2007–2010	4,100	400	4,500	46	0.04	1.5
Tice Pumping Plant	2008–2009	1,300	450	1,750	117	0.07	3.7
Highland Pipelines[a]	2007–2009	2,879	2,395	5,274	75	0.05	2.4
Tice Pipeline	2008–2009	743	635	1,378	41	0.03	1.3
Highland Reservoir	2007–2009	20,416	5,184	25,600	512	0.32	16.2
Leland Isolation Pipeline and Bypass Valves	2010	560	490	1,050	75	0.05	2.4
Combined Total	**2007–2010**	**55,934**	**30,053**	**85,987**	**1,124**	**1**	**35.2**
Upper San Leandro WTP	2011–2013	1,780	272	2,052	60	0.04	1.9
Happy Valley Pipeline	2011–2013	2,657	2,195	4,851	67	0.04	2.1
Glen Pipeline Improvements	2011–2012	702	580	1,282	64	0.04	2.0
Happy Valley Pumping Plant	2011–2013	0	0	0	0	0.00	0.0
Sunnyside Pumping Plant	2011–2013	0	0	0	0	0.00	0.0
Sobrante WTP[b]	2011–2013	37,047	15,464	52,511	263	0.16	8.3
Withers Pumping Plant	2011–2013	780	260	1,040	35	0.02	1.1
Lafayette WTP – Alternative 1	2012–2018	167,174	66,711	233,885	394	0.24	12.5
Lafayette WTP – Alternative 2	2015–2017	800	900	1,700	32	0.02	1.0
Orinda WTP – Alternative 1	2011–2013	15,692	3,144	18,836	292	0.18	9.2
Orinda WTP – Alternative 2	2012–2017	295,784	144,023	439,807	673	0.42	21.3
Orinda-Lafayette Tunnel – Alternative 2	2014–2017			1,024[d]	820	0.51	25.9
Orinda-Lafayette Pipeline – Alternative 2	2015–2017	26,243	21,956	48,199	240	0.15	7.6
Ardith Reservoir	2013–2015	8,500	6,400	14,900	497	0.31	15.7
Donald Pumping Plant	2013–2015	1,200	500	1,700	113	0.07	3.6
Fay Hill Pipeline	2015–2017	230	190	420	42	0.03	1.3
Fay Hill Reservoir	2015–2017	8,400	0	8,400	112	0.07	3.5
Fay Hill Pumping Plant	2015–2017	0	0	0	0	0.00	0.0
Moraga Reservoir	2016–2018	12,700	2,580	15,280	255	0.16	8.1
Combined Total – Alternative 1	**2011–2018**	**256,862**	**98,296**	**355,157**	**2,193**	**1**	**69.38**
Combined Total – Alternative 2[c]	**2011–2018**	**396,823**	**195,320**	**593,166**	**3,271**	**2**	**103.4**
WTTIP Total – Alternative 1	**2007–2018**	**313,473**	**128,508**	**441,982**	**3,306**	**2**	**104.5**
WTTIP Total – Alternative 2	**2007–2018**	**453,435**	**225,532**	**679,991**	**4,384**	**3**	**138.6**

a Earthwork activity requirements incorporate Lafayette Reclaimed Water Pipeline project.
b Approximately 10 percent less surface disturbance would occur under Alternative 2.
c Cut and fill volumes for tunnel not included.
d Daily maximum volume.

average daily earthmoving quantities associated with each WTTIP project and correlating dust emissions. Combined construction-phase average daily dust emissions were quantified for the entire WTTIP by adding average daily volumes from WTTIP projects with overlapping schedules. Estimated dust generation levels for projects evaluated at a program level of detail are also shown in Table 3.9-4.

Table 3.9-4 indicates that combined average daily PM_{10} emissions between 2007 and 2018 generated by construction of WTTIP projects would range between 36 and 103 lbs/day. Total WTTIP-related average emissions are estimated at 105 lbs/day under Alternative 1 and 139 lbs/day under Alternative 2. Since these emission estimates average total earthmoving volumes over the projected duration of the excavation and backfilling phases for most projects, actual emissions could be higher or lower on any given day, although they would be dispersed over a fairly broad geographic area. Additional unscheduled projects included in the WTTIP would contribute further to estimated dust emissions. Given the length of time that construction-related dust emissions would occur, it is appropriate to compare estimated PM_{10} emissions to the BAAQMD's operational significance criterion (80 lbs/day) for PM_{10}. This comparison indicates that combined WTTIP construction activities (i.e., the cumulative effect of the combined WTTIP projects) would have the potential to exceed the BAAQMD's significance criterion between 2011 and 2018 under Alternative 2. Since estimated combined levels for Alternative 1 would also approach this criterion, it is possible that the criterion could be exceeded on days when peak earthmoving activities occur. Therefore, implementation of the BAAQMD's standard dust control procedures (Measure 3.9-1a) will be implemented for all WTTIP projects, while enhanced dust control procedures (Measure 3.9-1b) will be implemented on projects scheduled between 2011 and 2018, where applicable.

Equipment Exhaust Emissions

Combustion emissions from construction equipment and vehicles (i.e., heavy equipment and delivery/haul trucks, worker commute vehicles, air compressors, and generators) would be generated during project construction. Emissions from construction worker commute trips would be minor compared to the emissions generated by construction equipment. Criteria pollutant emissions of ROG and NO_x from these emission sources would incrementally add to regional atmospheric loading of ozone precursors during project construction. The *BAAQMD CEQA Guidelines* recognize that construction equipment emits ozone precursors, but indicate that such emissions are included in the emission inventory that is the basis for regional air quality plans, and that construction emissions are not expected to impede the attainment or maintenance of ozone standards in the Bay Area (BAAQMD, 1999).

As indicated in Table 3.9-5, total WTTIP-related average emissions from equipment exhaust are estimated at up to 21 lbs/day for PM_{10}, 1,334 lbs/day for CO, 89 lbs/day for ROG, 410 lbs/day for NOx, and 44 lbs/day for SOx. Since these emission estimates are based on equipment usage estimates associated with average total earthmoving volumes over the projected duration of the excavation and backfilling phases for most projects, actual emissions could be higher or lower on any given day, although widely dispersed geographically. Additional unscheduled projects in the WTTIP would contribute further to these estimated emissions. Given the length of time that

TABLE 3.9-5
CONSTRUCTION EQUIPMENT EXHAUST EMISSIONS

WTTIP Component	Expected Timeframe of Construction	Cubic Yards of Earth Moved				Emissions Associated with Earthmoving Equipment (lbs/day)				
		Cut	Fill	Total Volume	Ave./Day	PM_{10}	CO	ROG	NOx	SOx
Moraga Road Pipeline	2007–2008	26,614	20,659	47,273	248	1	75	5	23	3
Walnut Creek WTP	2007–2010	4,100	400	4,500	46	0	14	1	4	0
Tice Pumping Plant	2008–2009	1,300	450	1,750	117	1	35	2	11	1
Highland Pipelines[a]	2007–2009	2,879	2,395	5,274	75	0	23	2	7	1
Tice Pipeline	2008–2009	743	635	1,378	41	0	12	1	4	0
Highland Reservoir	2007–2009	20,416	5,184	25,600	512	2	156	10	48	5
Lacassie (Leland Isolation) Pipeline	2010	560	490	1,050	75	0	23	2	7	1
Combined Total	**2007–2010**	**55,934**	**30,053**	**85,987**	**1,124**	**5**	**342**	**23**	**105**	**11**
Upper San Leandro WTP	2011–2013	1,780	272	2,052	60	0	18	1	6	1
Happy Valley Pipeline	2011–2013	2,657	2,195	4,851	67	0	20	1	6	1
Glen Pipeline Improvements	2011–2012	702	580	1,282	64	0	20	1	6	1
Happy Valley Pumping Plant	2011–2013	0	0	0	0	0	0	0	0	0
Sunnyside Pumping Plant	2011–2013	0	0	0	0	0	0	0	0	0
Sobrante WTP[b]	2011–2013	37,047	15,464	52,511	263	1	80	5	25	3
Withers Pumping Plant	2011–2013	780	260	1,040	35	0	11	1	3	0
Lafayette WTP – Alternative 1	2012–2018	167,174	66,711	233,885	394	2	120	8	37	4
Lafayette WTP – Alternative 2	2015–2017	800	900	1,700	32	0	10	1	3	0
Orinda WTP – Alternative 1	2011–2013	15,692	3,144	18,836	292	1	89	6	27	3
Orinda WTP – Alternative 2	2012–2017	295,784	144,023	439,807	673	3	205	14	63	7
Orinda-Lafayette Tunnel – Alternative 2	2014–2017			1,024[d]	820	4	249	17	77	8
Orinda-Lafayette Pipeline – Alternative 2	2015–2017	26,243	21,956	48,199	240	1	73	5	22	2
Ardith Reservoir	2013–2015	8,500	6,400	14,900	497	2	151	10	46	5
Donald Pumping Plant	2013–2015	1,200	500	1,700	113	1	34	2	11	1
Fay Hill Pipeline	2015–2017	230	190	420	42	0	13	1	4	0
Fay Hill Reservoir	2015–2017	8,400	0	8,400	112	1	34	2	10	1
Fay Hill Pumping Plant	2015–2017	0	0	0	0	0	0	0	0	0
Moraga Reservoir	2016–2018	12,700	2,580	15,280	255	1	77	5	24	3
Combined Total – Alternative 1	**2011–2018**	**256,862**	**98,296**	**355,157**	**2,193**	**11**	**667**	**44**	**205**	**22**
Combined Total – Alternative 2[c]	**2011–2018**	**396,823**	**195,320**	**593,166**	**3,271**	**16**	**995**	**66**	**306**	**33**
Program Total – Alternative 1	**2007–2018**	**313,473**	**128,508**	**441,982**	**3,306**	**16**	**1,006**	**67**	**309**	**34**
Program Total – Alternative 2	**2007–2018**	**453,435**	**225,532**	**679,991**	**4,384**	**21**	**1,334**	**89**	**410**	**44**

a Earthwork activity requirements incorporate Lafayette Reclaimed Water Pipeline project.
b Approximately 10 percent less surface disturbance would occur under Alternative 2.
c Cut and fill volumes for tunnel not included.
d Daily maximum volume.

construction-related equipment exhaust emissions would occur, this EIR compares estimated exhaust emissions to the BAAQMD's operational significance criteria (80 lbs/day for ROG, NOx, and $PM_{10;}$ 550 lbs/day for CO). This comparison indicates that combined WTTIP construction activities (i.e., the cumulative effect of the combined WTTIP projects) would have the potential to exceed the BAAQMD's significance criteria for CO and NOx between 2007 and 2018. Therefore, the WTTIP's combined construction-related emissions would be a significant impact, and the BAAQMD's standard emissions control measures (Measure 3.9-1c) would be implemented for all WTTIP projects constructed during this period.

Operation of diesel-powered construction equipment at all WTTIP sites could generate nuisance diesel odors at nearby receptors. Implementation of the BAAQMD's recommended emissions control measures (see Measure 3.9-1c) as part of all WTTIP projects would help minimize the potential for this nuisance problem. Measures include using line power (where feasible), restricting the idling of construction equipment, emissions controls and minimum setbacks for stationary equipment, and regular maintenance of construction equipment.

Lafayette WTP

Alternative 1

Tables 3.9-4 and 3.9-5 estimate average daily dust and exhaust emissions associated with proposed improvements at the Lafayette WTP under this alternative. As shown in the tables, this alternative would require more extensive earthmoving activities (cut and fill). Dust and exhaust emissions would occur primarily during the excavation and backfilling stages of construction (approximately 28 months of the four- to six-year construction period). This project would require extensive excavation to accommodate new treatment facilities, including two 11.8-million-gallon (mg), below-grade clearwell tanks that would be approximately 50 feet deep. Sensitive receptors in the project vicinity include residences located as close as 800 feet south of proposed facilities (300 feet from proposed pipelines) and recreational uses at the Lafayette Reservoir Recreational Area farther to the south.

Projected average daily construction emissions associated with this project alone would not exceed the above BAAQMD operational significance criteria. However, project-related construction emissions would still be considered significant because they would contribute to significant combined emissions (listed in Tables 3.9-4 and 3.9-5). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the extensive nature of earthmoving activities associated with Alternative 1, Measures 3.9-1a (standard dust control), 3.9-1b (enhanced dust control), and 3.9-1c (exhaust controls), below, would be required for this project.

Alternative 2

Proposed decommissioning and facility conversion at the Lafayette WTP would require limited earthmoving activities and would therefore have a limited potential for construction-related dust and exhaust emissions. This alternative would avoid extensive earthmoving activities at the

Lafayette WTP, but would result in greater overall dust and equipment exhaust emissions in the Lamorinda area (particularly at the Orinda WTP). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the limited nature of earthmoving activities associated with Alternative 2 at this facility, Measures 3.9-1a and 3.9-1c (standard dust and exhaust controls) would be adequate to reduce this impact to a less-than-significant level.

Orinda WTP

Alternative 1

As shown in Tables 3.9-4 and 3.9-5, this alternative would entail substantially less extensive earthmoving activities (cut and fill) at the Orinda WTP than at the Lafayette WTP. Dust and exhaust emissions would occur primarily during the excavation and backfilling stages of construction (approximately three months of the one- to two-year construction period). Sensitive receptors in the project vicinity include residences located as close as 170 feet west and 250 feet east of the Alternative 1 construction boundary.

Projected average daily construction emissions associated with this project alone would not exceed the above BAAQMD operational significance criteria. However, project-related construction emissions would still be considered significant because they would contribute to significant combined emissions (listed in Tables 3.9-4 and 3.9-5). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the extensive nature of earthmoving activities associated with Alternative 1, Measures 3.9-1a (standard dust controls), 3.9-1b (enhanced dust controls), and 3.9-1c (exhaust controls), below, would be required for this project.

Alternative 2

This alternative would entail significantly more extensive earthmoving activities (cut and fill) at the Orinda WTP than at the Lafayette WTP. Dust and exhaust emissions would occur primarily during the excavation and backfilling stages of construction (approximately 30 months of the four- to six-year construction period). Sensitive receptors include residences located as close as 100 feet west and 300 feet east of facility locations.

Projected average daily construction emissions associated with this project alone would not exceed the above BAAQMD operational significance criteria. However, project-related construction emissions would still be considered significant because they would contribute to significant combined emissions (listed in Table 3.9-5 for 2007 to 2010). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the extensive nature of earthmoving activities associated with Alternative 2, Measures 3.9-1a (standard dust controls), 3.9-1b (enhanced dust controls), and 3.9-1c (exhaust controls), below, would be required for this project.

Walnut Creek WTP – Alternative 1 or 2

As shown in Tables 3.9-4 and 3.9-5, this project would generate considerable dust and exhaust emissions, but less than would occur at the Lafayette WTP (Alternative 1) or Orinda WTP (Alternative 2). Dust and exhaust emissions would occur primarily during the excavation and backfilling stages of construction (approximately three months of the one- to two-year construction period). Sensitive receptors in the project vicinity include residences located as close as 300 feet east of proposed facilities.

Projected average daily construction emissions associated with this project alone would not exceed the BAAQMD operational significance criteria. However, project-related construction emissions would still be considered significant because they would contribute to significant combined (cumulative) emissions (listed in Table 3.9-5 for 2007 to 2010). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the extensive nature of earthmoving activities associated with this project, Measures 3.9-1a (standard dust controls), 3.9-1b (enhanced dust controls), and 3.9-1c (exhaust controls), below, would be required for this project.

Sobrante WTP – Alternative 1 or 2

As shown in Tables 3.9-4 and 3.9-5, this project would generate considerable dust and exhaust emissions, but less than would occur at the Lafayette WTP (Alternative 1) or Orinda WTP (Alternative 2). Dust and exhaust emissions would occur primarily during the excavation and backfilling stages of construction (approximately eight to nine months of the one- to two-year construction period). Sensitive receptors in the project vicinity include residences located as close as 550 feet north of facilities proposed east of Valley View Road and 150 feet west of facilities proposed west of this road.

Projected average daily construction emissions associated with this project alone would not exceed the BAAQMD operational significance criteria. However, project-related construction emissions would still be considered significant because they would contribute to significant combined (cumulative) emissions (listed in Tables 3.9-4 and 3.9-5 for 2011 to 2018). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the extensive nature of earthmoving activities associated with this project, Measures 3.9-1a (standard dust controls), 3.9-1b (enhanced dust controls), and 3.9-1c (exhaust controls), below, would be required for this project.

Upper San Leandro WTP – Alternative 1 or 2

As shown in Tables 3.9-4 and 3.9-5, this project would generate substantially less dust and exhaust emissions than many other WTTIP projects planned between 2011 and 2018. Dust and exhaust emissions would occur primarily during the excavation and backfilling stages of construction (approximately seven weeks of the one- to two-year construction period). Except for the proposed filter-to-waste equalization basin, proposed facilities would be constructed within

buildings or in paved areas. Sensitive receptors in the vicinity of this basin include residences located as close as 170 feet to the east.

Projected average daily construction emissions associated with this project alone would not exceed the BAAQMD operational significance criteria. However, project-related construction exhaust emissions would still be considered significant because they would contribute to significant combined emissions (listed in Table 3.9-5 for 2007 to 2010). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the undeveloped nature of the site and proximity to residential receptors (both alternatives), Measures 3.9-1a (standard dust controls), 3.9-1b (enhanced dust controls), and 3.9-1c (exhaust controls), below, would be required for this project.

Orinda-Lafayette Aqueduct – Alternative 2

Tunnel and pipeline construction would account for approximately one-third of the estimated dust and exhaust emissions between 2011 and 2018 (see Tables 3.9-4 and 3.9-5). Haul and material trucks would generate dust and exhaust throughout the excavation and tunnel lining phases (approximately two to three years for the tunnel and one to two years for the pipeline). Sensitive receptors are located as close as 500 feet west and east of the tunnel entrance portal in Orinda, 100 feet west of the tunnel exit portal, and 25 to 50 feet from the pipeline alignment. Bentley School is also adjacent to a portion of the pipeline alignment.

Projected average daily construction emissions associated with this project would exceed the BAAQMD operational significance criterion for NOx and would therefore be considered significant. These emissions could be increased further by operation of generators and ventilation fans at the tunnel exit shaft and the jack-and-bore pits near Bentley School. In addition, this project would contribute substantially to the combined WTTIP construction emissions (listed in Tables 3.9-4 and 3.9-5 for 2011 to 2018). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the extensive nature of earthmoving activities associated with this alternative, Measures 3.9-1a (standard dust controls), 3.9-1b (enhanced dust controls), and 3.9-1c (exhaust controls), below, would be required for this project. These controls would restrict the continuous operation of diesel equipment such as generators within 100 feet of a school or residential receptor. The proposed jack-and-bore pit near Bentley School would be located at least 200 feet from the school's parking lot, 500 feet from the school's baseball field, 800 feet from the school's classroom buildings, and 200 feet or more from the closest residential receptors. Therefore, stationary equipment operation restrictions would not apply to these jack-and-bore pits.

Ardith Reservoir and Donald Pumping Plant

While these projects would generate considerable dust and exhaust emissions, they would do so only for a short period of time. Dust and exhaust emissions would occur primarily during the excavation and backfilling stages of construction (approximately nine weeks of the one- to two-

year construction period). Residential uses completely surround this site and are located a minimum of 100 feet from proposed construction.

Projected average daily construction emissions associated with this site alone would not exceed the BAAQMD operational significance criteria; however, construction exhaust emissions would still be considered significant because they would contribute to significant combined emissions (listed in Tables 3.9-4 and 3.9-5 for 2011 to 2018). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the extensive nature of earthmoving activities and the proximity of sensitive receptors, Measures 3.9-1a (standard dust controls), 3.9-1b (enhanced dust controls), and 3.9-1c (exhaust controls), below, would be required for these projects.

Fay Hill Pumping Plant and Pipeline Improvements

The pumping plant portion of this project would generate low dust and exhaust emissions, since no excavation is proposed and minimal concrete work would be required. However, excavation of the pipeline within Rheem Boulevard would generate relatively low levels of dust and exhaust for approximately two weeks. There are no sensitive receptors immediately adjacent to proposed facilities, although there are residential uses as close as 100 feet south of the southern end of the pipeline alignment.

Projected average daily construction emissions associated with this project alone would not exceed the BAAQMD operational significance criteria. However, project-related construction exhaust emissions would still be considered significant because they would contribute to significant combined (cumulative) emissions (listed in Tables 3.9-4 and 3.9-5 for 2011 to 2018). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the limited nature of earthmoving activities associated with this project and absence of adjacent sensitive receptors, only Measures 3.9-1a (standard dust controls) and 3.9-1c (exhaust controls, EBMUD Policy 7.05 only), below, would be required for this project.

Fay Hill Reservoir

As shown in Tables 3.9-4 and 3.9-5, this project would generate less dust and exhaust than other reservoir projects, but high levels of dust and exhaust compared to other planned projects between 2014 and 2016. Dust and exhaust emissions would occur primarily during the excavation and backfilling stages of construction (approximately 15 weeks of the one-year construction period). There are no residential uses near this site, although residences are located along Rheem Boulevard, and residential projects are proposed along the lower section of the access road (off of Rheem Boulevard) and east of the reservoir site.

Projected average daily construction emissions associated with this project alone would not exceed the BAAQMD operational significance criteria. However, project-related construction exhaust emissions would still be considered significant because they would contribute to

significant combined emissions (listed in Tables 3.9-4 and 3.9-5 for 2011 to 2018). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the limited duration of earthmoving activities associated with this project (the site is already developed) and the absence of adjacent sensitive receptors, only Measures 3.9-1a (standard dust controls) and 3.9-1c (exhaust controls), below, would be required for this project. However, Measure 3.9-1b (enhanced controls) would also be required if residential uses are developed before the project is constructed.

Glen Pipeline Improvements

As shown in Tables 3.9-4 and 3.9-5, excavation of the pipeline would generate relatively low levels of dust and exhaust emissions for approximately 4 weeks. There are residential uses immediately adjacent to the proposed pipeline alignment.

Projected average daily construction emissions associated with this project alone would not exceed the BAAQMD operational significance criteria. However, project-related construction exhaust emissions would still be considered significant because they would contribute to significant combined emissions (listed in Tables 3.9-4 and 3.9-5 for 2011 to 2018). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Measures 3.9-1a (standard dust controls) and 3.9-1c (exhaust controls) would be required for this project.

Happy Valley Pumping Plant and Pipeline

Construction of the pumping plant portion of this project would depend on whether it is developed as a below-grade or at-grade facility. Dust and exhaust emissions would occur primarily during the site work stage of construction (approximately two weeks of the one- to two-year construction period). Excavation of the pipeline within Miner Road and Lombardy Lane would generate relatively low levels of dust and exhaust for approximately 14 weeks. Sensitive receptors along the pipeline alignment include residential uses and the Orinda Country Club Golf Course, which are located immediately adjacent to the alignment. Single-family residences are located approximately 50 feet to the east, 100 feet to the west, 150 feet to the north, and 400 feet to the south of the pumping plant site.

Projected average daily construction emissions associated with this project alone would not exceed the BAAQMD operational significance criteria. However, project-related construction exhaust emissions would still be considered significant because they would contribute to significant combined emissions (listed in Tables 3.9-4 and 3.9-5 for 2011 to 2018). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the limited nature of earthmoving activities associated with this project, but the close proximity of construction to sensitive receptors, Measures 3.9-1a (standard dust controls),

3.9-1b (enhanced dust controls, pumping plant site only), and 3.9-1c (exhaust controls), below, would be required for this project.

Highland Reservoir and Pipelines (including Lafayette Reclaimed Water Pipeline)

Construction of the reservoir and pipelines would generate considerable dust and exhaust emissions—higher than any other project scheduled between 2007 and 2010. Dust and exhaust emissions would occur primarily during the excavation and backfilling stages of reservoir construction as well as during pipeline construction (approximately 10 and 14 weeks, respectively, of the one- to two-year construction period). The closest sensitive receptors to the proposed Highland Reservoir include recreationists at Lafayette Reservoir (Lakeside Trail is approximately 300 feet to the south, while the Rim Trail extends around the reservoir and is located as close as 25 feet from the reservoir) and residential uses (approximately 1,500 feet to the east, separated by topography). The pipeline alignment is located as close as 650 feet from residences, while the proposed overflow pipeline traverses both the Lakeside and Rim Trails.

Projected average daily construction emissions associated with this project alone would not exceed the BAAQMD operational significance criteria. However, project-related construction emissions would still be considered significant because they would contribute to significant combined emissions (listed in Table 3.9-5 for 2007 to 2010). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the extent of earthmoving activities associated with this project, Measures 3.9-1a (standard dust controls), 3.9-1b (enhanced dust controls), and 3.9-1c (exhaust controls), below, would be required for this project.

Leland Isolation Pipeline and Bypass Valves

As shown in Tables 3.9-4 and 3.9-5, excavation of the pipeline within Lacassie Avenue would generate minimal levels of dust and exhaust emissions due to the short length of pipeline proposed, the short timeframe of the project (three weeks), and the pipeline's location in a paved street. There are no sensitive receptors in the vicinity of the proposed pipeline alignment.

Projected average daily construction emissions associated with this project alone would not exceed the BAAQMD operational significance criteria. However, project-related construction exhaust emissions would still be considered significant because they would contribute to significant combined emissions (listed in Table 3.9-5 for 2007 to 2010). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the small size of the project and the limited extent of earthmoving activities, only Measures 3.9-1a (standard dust controls) and 3.9-1c (exhaust controls, EBMUD Policy 7.05 only), below, would be required for this project.

Moraga Reservoir

As shown in Tables 3.9-4 and 3.9-5, this project would generate low dust and exhaust emissions, since minimal excavation is required for proposed facilities. Proposed excavation would generate dust and exhaust emissions for approximately two months, while material deliveries associated with demolition and reservoir construction would generate exhaust emissions over six months. Residential uses completely surround this site and are located a minimum of approximately 50 feet to the east, 100 feet to the southwest, and 150 feet to the northwest and northeast.

Projected average daily construction emissions associated with this project alone would not exceed the BAAQMD operational significance criteria. However, project-related construction exhaust emissions would still be considered significant because they would contribute to significant combined emissions (listed in Tables 3.9-4 and 3.9-5 for 2011 to 2018). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Since there would be limited excavation and material deliveries over eight months (the site is already developed), but residential uses are located in proximity to proposed construction, Measures 3.9-1a (standard dust controls) and 3.9-1c (exhaust controls), below, would be required for this project.

Moraga Road Pipeline

Excavation of the pipeline within Moraga Road and through the Lafayette Reservoir Recreation Area would generate relatively moderate levels of dust and exhaust emissions for approximately 38 weeks. Sensitive receptors include residential uses, located immediately adjacent to some pipeline segments, and Campolindo High School, located immediately west of the pipeline alignment.

Projected average daily construction emissions associated with this project alone would not exceed the BAAQMD operational significance criteria. However, project-related construction exhaust emissions would still be considered significant because they would contribute to significant combined emissions (listed in Table 3.9-5 for 2007 to 2010). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the extent of earthmoving activities associated with this project (a portion of pipeline would traverse undeveloped areas) and the proximity of residential and school uses, Measures 3.9-1a (standard dust controls), 3.9-1b (enhanced controls), and 3.9-1c (exhaust controls), below, would be required for this project.

Sunnyside Pumping Plant

Construction of this project would generate low dust and exhaust emissions, since no excavation is proposed and minimal concrete work would be required. Relatively low levels of material deliveries (seven per day or less) would occur for approximately six weeks over the one- to two-year construction duration. There is a single-family residence approximately 175 feet to the west, and a residence is planned on the property to the south.

Projected average daily construction emissions associated with this project alone would not exceed the BAAQMD operational significance criteria. However, project-related construction exhaust emissions would still be considered significant because they would contribute to significant combined emissions (listed in Tables 3.9-4 and 3.9-5 for 2011 to 2018). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the undeveloped nature of the pumping plant site and the presence of nearby residential uses, Measures 3.9-1a (standard dust controls), 3.9-1b (enhanced dust controls) and 3.9-1c (exhaust controls), below, would be required for this project.

Tice Pumping Plant and Pipeline

Construction of the pumping plant and pipeline would generate moderate dust and exhaust emissions (see Tables 3.9-4 and 3.9-5). Dust and exhaust emissions would occur primarily during the excavation and backfilling stages of pumping plant construction (approximately three weeks of the one- to two-year construction period). Pipeline construction would occur over approximately seven weeks. There is a single-family residence located 200 feet west of the pumping plant, and residential uses immediately adjacent to the proposed pipeline alignment.

Projected average daily construction emissions associated with this project alone would not exceed the BAAQMD operational significance criteria. However, project-related construction exhaust emissions would still be considered significant because they would contribute to significant combined emissions (listed in Table 3.9-5 for 2007 to 2010). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the undeveloped nature of the pumping plant site and the presence of nearby sensitive receptors, Measures 3.9-1a (standard dust controls), 3.9-1b (enhanced dust control, pumping plant site only), and 3.9-1c (exhaust controls), below, would be required for this project.

Withers Pumping Plant

Construction of this project would generate low dust and exhaust emissions, since no excavation is proposed and minimal concrete work would be required. Relatively low levels of material deliveries (seven per day or less) would occur over the 18-week construction duration. Single-family residences surround the site, approximately 150 feet to the south, 200 feet to the northeast (across Reliez Valley Road), and 300 feet to the northwest.

Projected average daily construction emissions associated with this project alone would not exceed the BAAQMD operational significance criteria. However, project-related construction exhaust emissions would still be considered significant because they would contribute to significant combined emissions (listed in Tables 3.9-4 and 3.9-5 for 2011 to 2018). The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the undeveloped nature of the pumping plant site and the presence of

nearby sensitive receptors, Measures 3.9-1a (standard dust controls), 3.9-1b (enhanced dust controls), and 3.9-1c (exhaust controls), below, would be required for this project.

Mitigation Measures

Measure 3.9-1a: The District will incorporate into the contract specifications the following requirements:

BAAQMD Basic Control Measures

- Maintain dust control within the site and provide adequate measures to prevent a dust problem for neighbors. Use water sprinkling, temporary enclosures, and other suitable methods to limit the rising of dust and dirt. Dust control will be adequate to ensure that no visible dust clouds extend beyond the project boundaries or extend more than 50 feet from the source of any onsite project construction activities.

- Load trucks in a manner that will prevent materials or debris from dropping on streets. Trim loads and remove all material from shelf areas of vehicles to prevent spillage. Take precautions when necessary to avoid cresting dust and littering by watering the load after trimming and by promptly sweeping the pavement to remove dirt and dust.

- Cover all trucks hauling soil, sand, and other loose materials.

- Pave, apply water, or apply nontoxic soil stabilizers or rock on all unpaved access roads, parking areas, and staging areas at construction sites.

- Sweep daily with water sweepers all paved access roads, parking areas, and staging areas at construction sites.

- Sweep streets daily with water sweepers if visible soil material is carried onto adjacent public streets.

Measure 3.9-1b: The District will incorporate into the contract specifications the following requirements:

BAAQMD Enhanced Control Measures

- Hydroseed or apply nontoxic soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).

- Enclose, cover, water, or apply nontoxic soil binders to exposed stockpiles (dirt, sand, etc.).

- Limit traffic speeds on unpaved roads to 15 miles per hour.

- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.

- Replant vegetation in disturbed areas as quickly as possible.

Measure 3.9-1c: To limit exhaust emissions, the District will incorporate into the contract specifications the following requirements:

BAAQMD Exhaust Controls

- Use line power instead of diesel generators at all construction sites where line power is available. Line power will be used at the tunnel entry and exit shafts for the Orinda-Lafayette Aqueduct project.

- As specified in EBMUD Policy 7.05, limit the idling of all mobile and stationary construction equipment to five minutes; as specified in Sections 2480 and 2485, Title 13, California Code of Regulations, limit the idling of all diesel-fueled commercial vehicles (weighing over 10,000 pounds, both California- or non-California-based trucks) to 30 seconds at a school or five minutes at any location. In addition, limit the use of diesel auxiliary power systems and main engines to five minutes when within 100 feet of homes or schools while driver is resting.

- For operation of any stationary, diesel-fueled, compression-ignition engines as part of construction of WTTIP facilities, comply with Section 93115, Title 17, California Code of Regulations, Airborne Toxic Control Measure for Stationary Compression Ignition Engines, which specifies fuel and fuel additive requirements as well as emission standards.

- If stationary equipment (such as generators for ventilation fans) must be operated continuously, locate such equipment at least 100 feet from homes or schools where possible.

- Require low-emissions tuneups and perform such tuneups regularly for all equipment, particularly for haul and delivery trucks. Submit a log of required tuneups to EBMUD on a quarterly basis for review.

Impact 3.9-2: Exposure of sensitive receptors to short-term increases in diesel particulates along truck haul routes during project construction.

Combustion emissions from construction equipment and vehicles (i.e., heavy equipment and delivery/haul trucks, worker commute vehicles, air compressors, and generators) would be generated during project construction. Diesel trucks would be used to transport excavated materials from WTTIP facility sites. Emissions from construction worker commute trips would be minor compared to the emissions generated by construction equipment. Construction emissions would result in an increase in $PM_{2.5}$ emissions in addition to PM_{10} and ozone precursors. $PM_{2.5}$ emissions would mainly result from diesel exhaust particulate matter (DPM) emitted by vehicles and equipment. Excavation, grading, and other soil-disturbance particulates are normally larger in diameter. Diesel exhaust particulates contain substances that are suspected carcinogens. Diesel exhaust contains both pulmonary irritants and hazardous compounds that may affect sensitive receptors such as young children, senior citizens, or those susceptible to respiratory disease.

In 2000, the CARB approved a comprehensive *Diesel Risk Reduction Plan* to reduce diesel emissions from both new and existing diesel-fueled engines. The plan focuses on reducing emissions through new standards and retrofitting and on reducing the sulfur content of diesel fuel

to enable the use of advanced DPM emission controls. The plan's goals are to achieve a 75 percent reduction in DPM by 2010 and an 85 percent reduction by 2020 (from the 2000 baseline). While many of the new regulations are source-based controls, in 2005 the CARB approved a regulatory measure to reduce emissions of toxic and criteria pollutants by limiting the idling of new heavy-duty diesel vehicles. The BAAQMD also encourages the consideration of available measures to reduce public exposure.

WTTIP implementation would generate varying levels of truck traffic on local streets in the Lamorinda area, and many of these streets have adjacent residential uses. Wagner Ranch Elementary School is adjacent to the ballfields where Orinda WTP facilities are proposed, while Campolindo High School is adjacent to the Moraga Road Pipeline alignment. Table 3.9-6 lists estimated maximum daily and hourly truck volumes that could occur along haul routes on any given day for each project.

The BAAQMD does not yet have a methodology for estimating impacts from diesel exhaust or determining the significance of a project's contribution. However, EBMUD conducted a DPM air study (URS Corporation, 2004) during construction activities at the Walnut Creek WTP. There was only one access route for haul trucks. DPM was measured at five locations (upwind, downwind, and background) to evaluate whether truck traffic along the haul route generated unhealthful DPM levels.

DPM samples were collected on two separate days; DPM levels, measured as elemental carbon, ranged from below detectable levels (laboratory reporting limit of 0.63 micrograms per square meter [$\mu g/m^3$]) in upwind samples to 1.5 to 2.59 $\mu g/m^3$ in downwind samples most affected by construction-related traffic. There were 82 haul truck trips on the corresponding sampling day, and no haul truck trips on the second sampling day. A comparison of data collected on two sampling days (with and without haul truck traffic) indicated a small difference in DPM concentrations (within 1 $\mu g/m^3$).

Measured levels were well below the federal maximum 24-hour $PM_{2.5}$ standard of 65 $\mu g/m^3$; however, measured levels are not strictly comparable, since this is a general particulate standard and since DPM samples were collected simultaneously over a nine-hour period (7 a.m. to 4 p.m.) when project construction traffic occurred. A more comparable standard for DPM may be the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) for DPM measured as elemental carbon. This TLV is defined as the level of exposure that the typical worker can experience over an extended period without an unreasonable risk of disease or injury. The ACGIH TLV for DPM is set a 20 $\mu g/m^3$.

This study determined that ambient concentrations of DPM in the vicinity of the Walnut Creek WTP were well below the ACGIH TLV level set for the protection of human health. Maximum downwind concentrations (with 84 one-way truck trips) were more than seven times lower than the ACGIH TLV. Based on the results of this study, it is estimated that up to 600 one-way truck trips per day could occur along a given haul route without causing an exceedance of the ACGIH TLV.

TABLE 3.9-6
MAXIMUM ONE-WAY TRUCK TRIPS BY PROJECT

WTTIP Component	Expected Timeframe of Construction	Maximum One-Way Truck Trips	
		Daily	Hourly
Projects Scheduled for 2007 to 2010			
Moraga Road Pipeline	2007–2008	76	10
Walnut Creek WTP	2007–2010	24	4
Tice Pumping Plant	2008–2009	76	10
Highland Pipeline/Lafayette Reclaimed Water Pipeline	2007–2009	34	4
Tice Pipeline	2008–2009	36	4
Highland Reservoir	2007–2009	168	24
Leland Isolation Pipeline	2010	24	3
Combined Total	**2007–2010**	**438**	**59**
Projects Scheduled for 2011 to 2018			
Upper San Leandro WTP	2011–2013	72	10
Happy Valley Pipeline	2011–2013	22	3
Glen Pipeline Improvements	2011–2012	11	3
Happy Valley Pumping Plant	2011–2013	14	2
Sunnyside Pumping Plant	2011–2013	14	2
Sobrante WTP (Alternative 1 or 2)	2011–2013	72	10
Withers Pumping Plant	2011–2013	98	12
Alternative 1			
▪ Lafayette WTP	2012–2018	72	12
▪ Orinda WTP	2011–2013	72	10
Alternative 2			
▪ Lafayette WTP	2015–2017	12	2
▪ Orinda WTP	2012–2017	144	21
▪ Orinda-Lafayette Aqueduct (Tunnel)	2014–2017	158	16
▪ Orinda-Lafayette Aqueduct (Pipeline)	2015–2017	84	10
Ardith Reservoir	2013–2015	168	24
Donald Pumping Plant	2013–2015	76	10
Fay Hill Pipeline	2015–2017	22	3
Fay Hill Reservoir	2015–2017	232	24
Fay Hill Pumping Plant	2015–2017	6	1
Moraga Reservoir	2016–2018	168	24
Combined Total – Alternative 1	2011–2012	**447**	**64**
Combined Total – Alternative 2	2011–2012	**447**	**63**
Combined Total – Alternative 1	2013–2014	**316**	**46**
Combined Total – Alternative 2	2013–2014	**546**	**71**
Combined Total – Alternative 1	2015–2018	**500**	**64**
Combined Total – Alternative 2	2015–2018	**826**	**101**
PROGRAM TOTAL – Alternative 1	2007–2018	**1,557**	**209**
PROGRAM TOTAL – Alternative 2	2007–2018	**1,799**	**234**

SOURCE: Table compiled by Orion Environmental Associates.

As Table 3.9-6 indicates, none of the maximum truck trip estimates for an individual WTTIP project would exceed 600 vehicles per day. When overlapping project schedules are considered (listed as "combined totals" in Table 3.9-6), the maximum combined truck trip estimate for both alternatives could exceed 600 vehicles per day between 2015 and 2018. When daily volumes are added for any given year under both alternatives, combined volumes range between 316 and 546 trips per day, with one exception. Daily combined volumes between 2015 and 2018 under Alternative 2 could exceed the 600 vehicles per day threshold. However, in order for such combined volumes to occur, the construction phases generating maximum haul and material trucks would have to occur at the same time and trucks associated with all the projects within those timeframes would have to use the same haul route, which is highly unlikely for this number of projects.

Most likely, projects scheduled during this three-year period would be in different construction phases on any given day, and therefore peak truck volumes would not occur at the same time. In addition, haul routes would be different (e.g., haul routes for most Alternative 2 projects would be on roads north of Highway 24, while haul routes for the Fay Hill and Moraga projects would be on roads south of Highway 24). On the basis of the DPM study for the Walnut Creek WTP and the maximum daily truck trip estimates prepared for the WTTIP, the ACGIH TLV for diesel is not expected to be exceeded along haul routes. In any event, when determining haul routes for each WTTIP project, EBMUD will consider all other scheduled WTTIP projects in the area that would use this route and will coordinate project schedules to ensure that the combined daily truck volume does not exceed 600 trips per day. Therefore, the impact is not considered significant, and no mitigation is necessary.

Impact 3.9-3: Air pollutant emissions from ventilation fans.

Methane gas could be encountered during proposed tunneling. Methane and hydrogen sulfide gases are generated by anaerobic processes associated with the decomposition of organic material. Methane is odorless and therefore is not expected to generate nuisance odor problems. However, if hydrogen sulfide gas is encountered, it could cause nuisance odor problems at nearby receptors. Diesel exhaust odors would be generated by tunnel boring equipment as well as the muck train and would be released into the atmosphere through the tunnel ventilation system. Calculated dispersion rates from the vent to the property boundary would be greater than 10-fold, which would reduce the potential for nuisance odors. In addition, exposure of the nearby residential receptors to these gases is expected to be less than significant, since Occupational Health and Safety Administration standards would limit the levels of these gases within the tunnel for worker safety. Dispersion into the atmosphere from the tunnel ventilation system would reduce levels by more than 10-fold, ensuring that receptor exposure would be well below levels occurring within the tunnel.

If ultramafic rock deposits are encountered during tunneling, there would be a potential for asbestos (chrysotile) emissions from the tunnel ventilation system. However, geologic mapping

indicates a low potential for encountering such rock along the tunnel alignment. Therefore, this alternative would not pose health hazards associated with the release of asbestos.

Mitigation Measure

> **Measure 3.9-3:** For any projects that would require a tunnel ventilation system, if hydrogen sulfide gas or any other odorous gases are encountered during tunnel excavation and become a nuisance odor problem (including diesel exhaust), water scrubbers will be added to the ventilation system and appropriate chemicals will be added to remove the nuisance odors.

Table 3.9-7 provides an overview of mitigation measures by WTTIP project for Impacts 3.9-1 and 3.9-3, above.

Operational Impacts

Impact 3.9-4: Long-term increases in criteria pollutants during operation of upgraded treatment facilities.

Water treatment facilities are not generally associated with "traditional" air pollution emissions, such as pollutants with state and federal standards, or those that might cause a localized nuisance due to odors, fumes, mist, etc. (Section 3.11, Hazards and Hazardous Materials, evaluates the potential for accidental release of treatment chemicals). The proposed modifications to treatment processes at WTTIP treatment facilities would result in minimal increases in air emissions, as described below. Other WTTIP pumping plant, reservoir, pipeline, chemical feed, and electrical facilities would be closed systems with no associated criteria pollutant emissions.

Operation of the project would also result in a nominal increase in the number of employee trips per day, but such minimal increases in traffic would have a less-than-significant impact on local and regional air quality.

Lafayette WTP

Alternative 1

The only proposed project improvement that has the potential to generate criteria pollutants would be the addition of a new 500-kilowatt, diesel-fueled emergency generator to serve proposed WTP facilities. The proposed generator would supplement the existing emergency generator at this facility and would be located adjacent to the proposed electrical substation. Like the existing generator, the proposed generator would be used infrequently (only during power outages and for periodic testing during the day). The proposed addition of the emergency generator would be subject to BAAQMD review and would require BAAQMD permitting before construction could occur. The permit review process would ensure that air emissions associated with the facility comply with applicable federal and state standards, and therefore the impact on air quality would be less than significant.

TABLE 3.9-7
SUMMARY OF APPLICABLE MITIGATION MEASURES – IMPACTS 3.9-1 AND 3.9-3

Facility	Measure 3.9-1a BAAQMD Standard Dust Control Measures	Measure 3.9-1b BAAQMD Enhanced Dust Control Measures[a]	Measure 3.9-1c BAAQMD Exhaust Controls	Measure 3.9-3 Tunnel Emissions Controls
Lafayette WTP				
Alternative 1	✓	✓	✓	–
Alternative 2	✓	–	✓	–
Orinda WTP				
Alternative 1	✓	✓	✓	–
Alternative 2	✓	✓	✓	–
Walnut Creek WTP				
Alternative 1 or 2	✓	✓	✓	–
Sobrante WTP				
Alternative 1 or 2	✓	✓	✓	–
Upper San Leandro WTP				
Alternative 1 or 2	✓	✓	✓	–
Orinda-Lafayette Aqueduct				
Alternative 2	✓	✓	✓	✓
Ardith Reservoir and Donald Pumping Plant	✓	✓	✓	–
Fay Hill Pumping Plant and Pipeline Improvements	✓	–	✓[b]	–
Fay Hill Reservoir	✓	✓[c]	✓	–
Glen Pipeline Improvements	✓	–	✓	–
Happy Valley Pumping Plant and Pipeline	✓	✓	✓	–
Highland Reservoir and Pipelines	✓	✓	✓	–
Lafayette Reclaimed Water Pipeline	✓	✓	✓	–
Leland Isolation Pipeline and Bypass Valves	✓	–	✓[b]	–
Moraga Reservoir	✓	–	✓	–
Moraga Road Pipeline	✓	✓	✓	–
Sunnyside Pumping Plant	✓	✓	✓	–
Tice Pumping Plant and Pipeline	✓	✓	✓	–
Withers Pumping Plant	✓	✓	✓	–

[a] These measures would apply only to projects where soils are stockpiled, construction equipment/trucks travel on unpaved roads, site runoff drains to a public roadway, or disturbed areas would remain unpaved.
[b] Under this measure, only EBMUD Policy 7.05 would be required for this project.
[c] Required if residential uses are developed before the project is constructed.

✓ = Applicable Impact
– = No Impact

Alternative 2

No increase in criteria pollutant emissions would occur as a result of proposed project- or program-level improvements under this alternative.

Orinda WTP – Alternative 1 or 2

The only proposed project improvement that has the potential to generate criteria pollutants would be the addition of a new 200-kilowatt, diesel-fueled emergency generator to serve proposed WTP facilities. The proposed generator would be located adjacent to the proposed backwash water recycle system building and the proposed electrical substation and would supplement the existing emergency generator located at this facility. Like the existing generator, the proposed generator would be used infrequently (only during power outages and for brief periodic testing during the day [typically once per month]). The proposed addition of an emergency generator would be subject to BAAQMD review and would require BAAQMD permitting before construction could occur. The permit review process would ensure that air emissions associated with the facility comply with applicable federal and state standards, and therefore the impact on air quality would be less than significant.

Walnut Creek WTP – Alternative 1 or 2

No increase in criteria pollutant emissions would occur as a result of proposed project improvements.

Sobrante WTP – Alternative 1 or 2

The only proposed improvement at this facility that has the potential to generate criteria pollutants would be the new ozone destruct system. New ozonation systems would be constructed within existing buildings on the main part of this site (east of Valley View Road). Liquid oxygen is proposed to be used at this facility and would be transported by truck and stored in above-ground tanks in the northeastern portion of the facility site. Ozone production via high-voltage electrical discharge would occur in a sealed system with no atmospheric release. The only atmospheric pathway for any emissions would be through a small vent on the ozone destruct unit. Residual ozone in the destruct unit vent is currently in the sub-parts-per-million range, and emissions from the new system would be similar to the existing system. Dilution with the free atmosphere typically reduces the destruct unit exhaust to undetectable levels within 100 feet from the unit. The proposed ozone destruct system would be located at least 600 feet from existing residences to the west, and 900 or more feet from homes to the east and north. Air pollution emissions associated with ozonation systems are expected to be less than significant at the closest residential receptors.

Any modified air emission sources and water treatment processes (such as ozonation) would be subject to BAAQMD review and could require BAAQMD permitting before construction could occur. The permit review process would ensure that air emissions associated with the facility comply with applicable federal and state standards.

Upper San Leandro WTP – Alternative 1 or 2

As with the Sobrante WTP, the only proposed improvement at this facility that has the potential to generate criteria pollutants would be the new ozone destruct system. New ozonation systems would be constructed within existing buildings. Liquid oxygen is proposed to be used at this facility and would be stored in above-ground tanks in the southern portion of the facility site. As described for the Sobrante WTP, residual ozone would be emitted from the ozone destruct unit vent and would be at undetectable levels within 100 feet from the unit. The proposed ozone destruct system would replace the existing ozone destruct system, which is located within a building that is approximately 50 to 150 feet southeast of existing residences. The vent location would not change, and system emissions are expected to remain generally the same with the proposed project. However, any modified air emission sources and water treatment processes (such as ozonation) would be subject to BAAQMD review and could require revision of the existing BAAQMD permit before construction could occur. The permit review process would ensure that air emissions associated with the facility comply with applicable federal and state standards, and therefore the impact on air quality would be less than significant.

Impact 3.9-5: Generation of odors during operation of project facilities.

Nuisance odor problems are not expected to result from operation of the proposed WTTIP water facilities due to the low biological content (and consequent anaerobic activity) in the water as well as the enclosed nature of most proposed facilities. With the exception of filters and some basins at water treatment facilities, existing treatment, conveyance, and storage facilities are enclosed.

Filters at water treatment facilities are not typically a source of odors; odors associated with anaerobic activity do not occur since the water is aerated. Therefore, proposed upgrade/expansion of filters under Alternative 1 at the Lafayette and Walnut Creek WTPs is not expected to increase the potential for nuisance odors.

Implementation of the WTTIP would result in the relocation of existing flocculation/ sedimentation basins at the Lafayette WTP (Alternative 1) and Orinda WTP (both alternatives). The existing basins are currently a minor source of odors, and the potential for nuisance odors is not expected to change significantly with the proposed minor relocation of these basins within the WTP facility sites.

Impact 3.9-6: Secondary emissions at power plants due to the generation of electricity to operate pumps and other facilities, and short-term increases in criteria air pollutants during power outages requiring the use of emergency generators.

Construction of the WTTIP facilities would result in an irretrievable and irreversible commitment of natural resources through direct consumption of fossil fuels and use of materials. That commitment of resources would end when construction is completed. Over the long term, the WTTIP would result in an increase in emissions primarily through energy consumption. Operation of new or expanded facilities (both project- and program-level projects) at water treatment facilities and pumping plants would result in secondary emissions associated with electricity generation. Electricity generation related to fossil-fuel combustion generates air pollutants. However, approximately 30 percent of PG&E's electricity is derived from renewable energy resources, and PG&E plans to increase this amount by 8 percent by 2010. In addition, power generation and transmission within the PG&E service area is part of the regional power grid (controlled the California Independent System Operator). Since emissions associated with power generation are regional in nature and could occur outside the air basin or outside California, the project's incremental increase in operational power demand is not expected to create a significant secondary air quality impact within the air basin.

To help reduce future energy demand, EBMUD actively seeks to minimize fossil fuel use through its renewable energy program. EBMUD operates two hydroelectric power plants in the Sierra Nevada foothills and also implemented a 30-kilowatt solar photovoltaic project in Oakland. Projects being planned by EBMUD include a 420-kilowatt solar photovoltaic facility at the Sobrante WTP.

Program-Level Elements

Lafayette WTP

Operation of heavy equipment during construction of proposed program facilities at the Lafayette WTP would generate dust and exhaust emissions, primarily during earthmoving activities. Earthmoving activities for the Walter Costa Trail and relocation would likely be minimal. The closest sensitive receptors are private residences approximately 500 feet to the south. The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Measures similar to Measures 3.9-1a (standard dust control) and 3.9-1c (exhaust controls), described above for project-level elements, would be required for this program-level project. Measures similar to Measure 3.9-1b (enhanced dust control), above, could be required depending on the extent of earthmoving activities for certain facilities (e.g., high-rate sedimentation units).

Orinda WTP

Operation of heavy equipment during construction of proposed program-level facilities would generate dust and exhaust emissions. Dust and exhaust emissions (including diesel particulate matter) would occur primarily during earthmoving activities, which would generally be extensive when clearwells are constructed. Sensitive receptors in the vicinity of these projects include private residences approximately 200 feet to the west and 300 feet to the east of proposed facilities under both alternatives. In addition, the southern boundary of Wagner Ranch Elementary School is approximately 15 feet north of the northernmost clearwell under both alternatives. Since the proposed clearwell would be located adjacent to a school, construction-related truck operations could be subject to idling limits (EBMUD Policy 7.05, as specified in Measure 3.9-1c) to maintain acceptable diesel particulate matter levels at this school. The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Due to the extensive nature of earthmoving activities that would likely be associated with clearwell excavation, measures similar to Measures 3.9-1a (standard dust control), 3.9-1b (enhanced dust control), and 3.9-1c (exhaust controls), described above for project-level elements, would be required for this program-level project under either alternative.

Walnut Creek WTP

Program-level improvements would include the addition of high-rate sedimentation units, post-filtration UV treatment, and ozonation systems by 2022. Air pollution emissions associated with ozonation systems are expected to be minimal. Pure oxygen would likely be transported onsite by large tanker trucks. Ozone production via high-voltage electrical discharge would occur in a sealed system with no atmospheric release. The only atmospheric pathway for emissions would be a small vent on the ozone destruct unit. Residual ozone in the destruct unit vent is in the sub-parts-per-million range. Dilution with the free atmosphere typically reduces the destruct unit exhaust to undetectable levels within 100 feet of the unit.[2] The ozone destruct system would likely be located at least 300 feet from existing residences to the east. Therefore, air pollution emissions associated with ozonation systems are expected to be less than significant at the closest residential receptors.

Leland Reservoir Replacement

Operation of heavy equipment during demolition and construction of the proposed reservoir would generate dust and exhaust emissions, primarily during earthmoving activities. Sensitive receptors include residential uses as close as 120 feet to the west and 400 feet to the east (across Leland Drive). White Pony-Meher Elementary School is immediately to the south, with the classroom building approximately 150 feet from the reservoir. The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Given the site's proximity to sensitive receptors, measures similar to Measures 3.9-1a (standard dust control), 3.9-1b

[2] Based on the design specifications for other destruct units, the allowable ozone emission concentration is typically less than 0.35 ppm. Calculated dispersion rates from the rooftop vent to the fenceline would be greater than 10-fold. Therefore, fenceline ozone concentrations would be less than 0.035 ppm, which is below the ambient level.

(enhanced dust control), and 3.9-1c (exhaust controls), described above for the project-level elements, would likely be required for this program-level project.

New Leland Pressure Zone Reservoir and Pipeline

Operation of heavy equipment during demolition and construction of the proposed reservoir and pipeline would generate dust and exhaust emissions, primarily during earthmoving activities. Sensitive receptors include residential uses as close as 200 feet to the north and 60 feet to the east of proposed grading limits for the reservoir. Residential uses are also located in proximity to the pipeline alignments west of Danville Boulevard. The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Given the site's proximity to sensitive receptors and the extensive earthmoving activities that could be required, measures similar to Measures 3.9-1a (standard dust control), 3.9-1b (enhanced dust control), and 3.9-1c (exhaust controls), described above for the project-level elements, would likely be required for this program-level project.

St. Mary's Road/Rohrer Drive Pipeline

Operation of heavy equipment during construction of the proposed replacement pipeline extension would generate dust and exhaust emissions. Dust and exhaust emissions would occur primarily during excavation and backfilling activities. Residential uses are located immediately adjacent to the road along some sections of the proposed pipeline alignment. St. Mary's College is adjacent to the alignment, although the campus is set back from the road. Campolindo High School is also located near to the pipeline alignment. The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Measures similar to Measures 3.9-1a (standard dust control) and 3.9-1c (exhaust controls), described above for project-level elements, would be required for this program-level project. A measure similar to Measure 3.9-1b (enhanced dust control), above, could be required depending on the extent of earthmoving activities.

San Pablo Pipeline

Operation of heavy equipment during construction of the proposed pipeline would generate dust and exhaust emissions, primarily during excavation and backfilling activities. Most of the proposed alignment crosses undeveloped lands adjacent to San Pablo Reservoir and Tilden Park. However, the north and south ends would be adjacent to or near residential uses. Wagner Ranch Elementary School in Orinda is located east of the pipeline alignment. The BAAQMD considers potential construction-related impacts to be mitigated to a less-than-significant level with implementation of BAAQMD-recommended dust and equipment exhaust controls. Measures similar to Measures 3.9-1a (standard dust control) and 3.9-1c (exhaust controls), described above for project-level elements, would likely be required for this program-level project. A measure similar to Measure 3.9-1b (enhanced dust control), above, could be required depending on the extent of earthmoving activities.

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