3.6 LAND USE

This section describes the existing physical and regulatory setting related to land use, existing and planned land uses, and discusses the potential effects of the EA Alternatives related to land use and planning.

3.6.1 Regulatory Framework

The VA Transfer Parcel is located on federal land owned by the Navy and that would be transferred to VA ownership; thus, the Proposed Action is exempt from local planning regulations of the adjacent jurisdictions, which include the City of Alameda, Alameda County, and the City and County of San Francisco. Although the Proposed Action is not subject to the regulations of regional and local jurisdictions, relevant jurisdictional bodies and plans are discussed below, to provide a land use planning context.

NAS Alameda Community Reuse Plan

The City of Alameda and the Alameda Reuse and Redevelopment Authority (ARRA) adopted the *NAS Alameda Community Reuse Plan* (Reuse Plan) in 1996, which was prepared to guide future development of the property following disposal from federal ownership. The Reuse Plan is a long-term plan that envisions redeveloping former NAS Alameda into a mixed-use, transit-oriented land use community. The redevelopment would be phased and generally consist of residential, commercial mixed use, town center retail, neighborhood center mixed-use, employment center, and community/civic uses (ARRA, 2006). The Reuse Plan does not apply to the VA Transfer Parcel (as federally owned property, the VA Transfer Parcel would be outside the jurisdiction of local and State planning and zoning laws and regulations) and only applies to the larger Alameda Point planning area.

City of Alameda Zoning Ordinance

The City of Alameda Zoning Ordinance provides development regulations for all properties within the City. The VA Transfer Parcel is currently zoned M-2-G, a general industrial (manufacturing) district with a special government combining overlay (G). Permitted uses consist of a wide range of commercial and industrial uses, including heavy manufacturing. Conditionally permitted uses include airports and related facilities, shipping terminals, unenclosed uses, and commercial marinas. The G combining district is intended to be combined with other zoning districts and to be applied to lands under government ownership. As federally owned property, the VA Transfer Parcel is outside the jurisdiction of local and State planning and zoning laws and regulations and the City of Alameda Zoning Ordinance does not apply.

Coastal Zone Management Act (CZMA)

The CZMA requires that federal actions be consistent to the maximum extent practicable with federally approved state coastal plans. Coastal states prepare coastal management programs under the CZMA. Once the federal government approves a state's coastal management program, a state gains federal consistency review authority. California's federally approved coastal management program contains two designated coastal zone management agencies that implement the federal consistency provisions: the California Coastal Commission for all coastal areas outside San Francisco Bay and the San Francisco Bay Conservation and Development Commission (BCDC)

for the coastal areas in San Francisco Bay. Refer to Section 3.2 (Water Resources) for further discussion of the CZMA and BCDC.

3.6.2 Affected Environment

Existing Land Uses on the VA Transfer Parcel

The VA Transfer Parcel is located in the western portion of former NAS Alameda (see Figure 1-1). The parcel is located within the boundaries of the City of Alameda, with the exception of the southwest corner, which is within the jurisdictional boundaries of the City and County of San Francisco.

The VA Transfer Parcel is comprised of the airfield area of former NAS Alameda. The entire parcel, which is comprised of human-made lands, has been developed or disturbed and is mostly comprised of former airfield infrastructure (e.g., inactive paved runways and taxiways), paved aircraft parking areas, vacant structures and buildings, seven former military bunkers, and other airfield support infrastructure. Areas of vegetated open space are located throughout the parcel, with the largest vegetated areas located in the southern and western portions of the parcel. In addition, a California Least Tern colony is located within a 9.7-acre fenced area of the former airfield (see Figure 1-2). With the exception of the ongoing California Least Tern management efforts, the VA Transfer Parcel is vacant and unused.

Surrounding Land Uses

The VA Transfer Parcel is bordered by the San Francisco Bay to the west and south, and the remainder of the former NAS Alameda property (Alameda Point) to the north and east. The Alameda Point area to the north of the VA Transfer Parcel is comprised of vegetated open space, former airfield infrastructure, and vacant buildings and structures. Further north is the Oakland Inner Harbor and the Port of Oakland, an industrial shipping container terminal. The Alameda Point area to the east of the VA Transfer Parcel is comprised of the former air stations aircraft hangars, office and industrial buildings, and recreational space. This area is currently being utilized by tenants for non-military light-industrial/manufacturing, public administration, office, commercial, and recreational uses. Further east is the City of Alameda, including residential land uses.

The Alameda Point area is the focus of redevelopment by the City of Alameda. The City of Alameda adopted the *NAS Alameda Community Reuse Plan* (Reuse Plan) in 1996, which was prepared to guide future development of Alameda Point following disposal from federal ownership. The Reuse Plan is a long-term plan that envisions redeveloping the former NAS Alameda into a mixed-use, transit-oriented land use community. The redevelopment would be phased and would consist of residential, commercial mixed use, town center retail, neighborhood center mixed-use, employment center, and community/civic uses (ARRA, 2006). The Reuse Plan does not apply to the VA Transfer Parcel (as federally owned property, the VA Transfer Parcel would be outside the jurisdiction of local and State planning and zoning laws and regulations) and only applies to the larger Alameda Point area.

3.6.3 Environmental Consequences

Assessment Methods

The land use analysis compares land use conditions at full build-out of each alternative against the existing land use environment or baseline condition. Impacts related to coastal zone management are discussed in Section 3.2, (Water Resources). Impacts related to recreational uses are discussed in Section 3.13 (Public Services).

Alternative 1

Construction

Construction of Alternative 1 would not contribute to the physical division of an established community by constructing physical barriers or obstacles to circulation. In addition, construction activities associated with this alternative would occur within the boundaries of the VA Transfer Parcel and would not result in direct conflicts with existing and planned land uses in the surrounding community. Therefore, no significant adverse construction impacts on land use would occur.

Operation

In the past, NAS Alameda operated as a secured military site and provided no public access, with little physical connectivity to the surrounding community. Alternative 1 would redevelop a portion of this underutilized and vacant property and provide limited public access within the VA Development Area. However, access would be limited within the larger VA Transfer Parcel, specifically the CLT colony and open space areas located within the southern portion of the parcel. This area would be limited for the protection and conservation of the CLT (see Section 3.1 [Biological Resources] for more information).

Proposed land uses in the surrounding community (i.e., Alameda Point Reuse Plan), when combined with the Proposed Action, would provide a more continuous land use pattern than existing conditions and provide new services. Alternative 1 would provide improved connectivity between the VA Development Area and land uses in the surrounding community by improving and providing new pedestrian, bicycle, and street connections. Therefore, Alternative 1 would not physically divide an established community; rather it would integrate the VA Development Area into the surrounding community. This would be considered a beneficial impact.

Under Alternative 1, the built environment of the VA Development Area would change and include new land uses and activities, including medical, memorial, and cemetery uses, than under existing conditions. Reuse of the VA Transfer Parcel as proposed under Alternative 1 would alter the existing land use character by converting the currently underutilized land uses within the project site to productive uses; provide infrastructure improvements and community services; and provide limited access open space. As such, Alterative 1 would improve the existing land use condition and would result in a beneficial impact.

Following transfer from the Navy to VA, the property would remain under federal ownership and would continue to not be under the jurisdiction of local and State land use and zoning and local planning regulations and reviews would not be applicable. However, the Proposed Action would be compatible with existing and proposed land uses surrounding the VA Transfer Parcel, including the Alameda Point Civic Core planning area (e.g., mixed-use

office, institutional, industrial, attached residential, and recreational land uses) to the east and the Alameda Point Northwest Territories planning area (e.g., park and recreational land uses) to the north.

Implementation of Alternative 1 would not physically divide an established community; conflict with substantive requirements of local land use plans or policies (as federally owned property, the VA Transfer Parcel would be outside the jurisdiction of local and State planning and zoning laws and regulations); and the Proposed Action is compatible with and would not have a substantial adverse impact on the existing character and planned uses of the surrounding community. Therefore, Alternative 1 would not have a significant adverse impact on land use.

Alternative 2 (Preferred Alternative)

Construction

Effects on land use resulting from implementation of Alternative 2 would be identical to those identified under Alternative 1. Therefore, no significant adverse construction impacts on land use would occur.

Operation

Alternative 2 would involve the same project components as Alternative 1; however, under Alternative 2, the VA Development Area would be located farther north and would extend into the Northwest Territories subarea of the NAS Alameda property. The operation of VA facilities proposed under Alternative 2 would be similar to operation under Alternative 1, because this alternative would include the same types of uses, only in a different site configuration and a larger area. Thus, operational land use impacts of Alternative 2 would essentially be the same as those of Alternative 1.

Implementation of Alternative 2 would not physically divide an established community; conflict with substantive requirements of local land use plans or policies; and the Proposed Action is compatible with and would not have a substantial adverse impact on the existing character and planned uses of the surrounding community. Therefore, Alternative 2 would not have a significant adverse impact on land use.

No Action Alternative

Construction

Under the No Action Alternative, the fed-to-fed transfer would not take place and the proposed development (e.g., VHA OPC, VBA Outreach Office, NCA Cemetery, etc.) would not be built. Therefore, no significant construction impacts on land use would occur.

Operation

Under the No Action Alternative, the fed-to-fed transfer would not take place and the proposed development and operations (e.g., VHA OPC, VBA Outreach Office, NCA Cemetery, etc.) would not occur. Therefore, no significant operational impacts on land use would occur.

3.6.4 References

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3.7 AIR QUALITY

This section describes the existing conditions and regulatory framework and also evaluates the potential air quality effects of each of the EA Alternatives.

3.7.1 Regulatory Framework

Air quality in the San Francisco Bay Area Air Basin (SFBAAB) is regulated at the federal level by USEPA, at the state level by the California Air Resources Board (ARB), and at the local level by the Bay Area Air Quality Management District (BAAQMD). Each of these agencies develops rules, regulations, and policies for regulating air quality in accordance with applicable legislation. Although USEPA regulations may not be superseded, both state and local regulations may be more stringent. Applicable regulations associated with emissions of criteria air pollutants, toxic air contaminants (TACs), and odors are described in the following sections.

Clean Air Act (CAA)

The USEPA is the agency responsible for enforcing the CAA of 1970 and its 1977 and 1990 amendments. The purpose of the CAA is to establish national ambient air quality standards (NAAQS), which classify areas as to their attainment status relative to NAAQS; develop schedules and strategies to meet the NAAQS; and to regulate emissions of criteria pollutants and air toxics to protect public health and welfare. Under the CAA, individual states are allowed to adopt ambient air quality standards and other regulations, provided they are at least as stringent as federal standards. The Clean Air Act Amendments (CAAA) established new deadlines for achievement of NAAQS, dependent upon the severity of nonattainment.

The USEPA requires each state to prepare a State Implementation Plan (SIP), which describes how that state will achieve compliance with NAAQS. A SIP is a compilation of goals, strategies, schedules, and enforcement actions that will lead the state into compliance with all federal air quality standards. Each change to a compliance schedule or plan must be incorporated into the SIP. In California, the SIP consists of separate elements for each air basin, depending upon the attainment status of the particular air basin.

The CAAA also require that states develop an operating permit program that would require permits for all major sources of pollutants. The program would be designed to reduce criteria pollutant emissions and control emissions of hazardous air pollutants by establishing control technology guidelines for various classes of emission sources. Under the CAA, state and/or local agencies may be delegated authority to administer the requirements of the CAA.

General Conformity Rule

Pursuant to the implementing regulations of the CAA, as amended, (40 CFR Part 93 and the provisions of Part 51, Subchapter C, Chapter I, Title 40, Appendix W of the CFR), federal agencies are required to demonstrate that federal actions conform with the applicable SIP. In order to ensure that federal activities do not hamper local efforts to control air pollution, Section 176(c) of the CAA, 42 USC 7506(c) prohibits federal agencies, departments, or instrumentalities from engaging in, supporting, providing financial assistance for, licensing, permitting or approving any action which does not conform to an approved SIP or federal implementation plan.

The purpose of the General Conformity Rule is to ensure that federal activities do not cause or contribute to new violation of NAAQS; ensure that actions do not cause additional or worsen existing violations of criteria air pollutants or contribute to new violations the NAAQS; and ensure that attainment of the NAAQSs is not delayed.

In order to demonstrate conformity with the General Conformity Rule, a project must clearly demonstrate that it does not cause or contribute to any new violation of any standard in any area; increase the frequency or severity of any existing violation of any standard in any area; or delay timely attainment of any standard, any required interim emission reductions, or other milestones in any area. A conformity applicability analysis is required for each of the nonattainment pollutants or its precursor emissions. A federal action is except from the General Conformity Rule requirements if the action's total net emissions are below the applicable *de minimis* threshold (see Table 3.7-2) or are otherwise exempt per 40 CFR 51.153. In the past, USEPA has also required that an action's annual emissions are evaluated against 10% of the region's nonattainment or maintenance pollutants to determine if the action's emissions are regionally significant. On March 24, 2010, USEPA removed this requirement from their General Conformity Rule (EPA, 2010). Nevertheless, for a conservative analysis, this EA also evaluates the project's emissions for regional significance.

The General Conformity Rule as it relates to the Proposed Action is discussed below under each of the EA Alternatives (see Section 3.7.3 "Environmental Consequences").

3.7.2 Affected Environment

The VA Transfer Parcel is located in Alameda County, which is within the SFBAAB. The SFBAAB encompasses all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties; the southern portion of Sonoma County; and the southwestern portion of Solano County. About 19% of California's population resides in the Bay Area, and pollution sources in the region account for about 15% of the total State-wide emissions of criteria pollutants (ARB, 2009a). Existing air quality conditions in an area are influenced by natural factors such as topography, meteorology, and climate in addition to the sources of emissions, as discussed below.

Climate and Topography

The SFBAAB is characterized by complex terrain consisting of coastal mountain ranges, inland valleys, and bays that affect wind flow patterns. The climate is dominated by the strength and location of a semi-permanent, subtropical high-pressure cell, and results in cool, damp summers and mild, rainy winters. The Coast Ranges, which trend northwest along the west side of the SFBAAB, have two major open areas (located at the Golden Gate Bridge and at the Carquinez Strait) that allow air to flow in and out of the SFBAAB and the Central Valley. The greatest distortions to normal wind flow occur when low-level inversions are present and the air beneath the inversion flows independently of air above the inversion, a condition that is common in the summer. During these summertime inversions, pollutant concentrations can build to unhealthy levels within the inversion layer because of the lack of dispersion. During the summer, winds flowing from the northwest are drawn inland through the Golden Gate and over the lower portions of the San Francisco Peninsula. Immediately south of Mount Tamalpais, the northwesterly winds accelerate considerably and come more directly from the west as they stream through the Golden Gate (BAAQMD, 2010a).

Properties, Effects, and Sources of Criteria Pollutants

The USEPA currently focuses on the following criteria air pollutants as indicators of ambient air quality: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM), and lead (Pb). Because these are the most prevalent air pollutants known to be deleterious to human health and extensive health-effects criteria documents are available, these pollutants are commonly referred to as *criteria air pollutants*. The federal CAA requires USEPA to set outdoor air quality standards for the nation. USEPA has established primary and secondary NAAQS for the criteria pollutants; for PM, standards have been established for respirable particulate matter (PM_{10}) and for fine particulate matter ($PM_{2.5}$). The primary standards protect the public health and the secondary standards protect public welfare.

The EPA also permits states to adopt additional or more protective air quality standards if needed. The ARB has established California ambient air quality standards (CAAQS) for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particulate matter, in addition to the above-mentioned criteria air pollutants. In most cases, the CAAQS are more stringent than the NAAQS. In addition, the same criteria air pollutants are subject to a General Conformity review if the region where the Proposed Action is taking place has been designated a nonattainment or maintenance area (see Section "Local Air Basin Attainment Status" below). The CAAQS and NAAQS are listed in Table 3.7-1 and described below.

Ozone

O_3 is a gas that is not directly emitted into the atmosphere but formed when reactive organic gases (ROG) and nitrogen oxides (NO_x), both as byproducts of combustion, undergo photochemical reactions in the presence of sunlight. ROG can also originate from the evaporation of chemical solvents or fuels. Ozone concentrations are generally highest during the summer months when maximum solar isolation and warm temperatures are conducive to ozone formation. Because of the reaction time involved in forming ozone, peak concentrations are often found many miles downwind of their precursor emissions. As a result, O_3 is known as a regional pollutant, which has concentrations that are homogeneously spread throughout an airshed.

Carbon Monoxide

CO is a colorless, odorless gas produced by the incomplete combustion of fuels, primarily from transportation sources. Wood-burning stoves, incinerators, and other industrial processes represent other sources of CO. Concentrations of CO tend to be the highest during winter mornings, when light winds and surface-based inversions trap the pollutant at ground levels. Since the primary source of CO occurs from motor vehicles operating at slow speeds, the highest ambient CO concentrations are generally found near congested transportation corridors and intersections. In contrast to O_3, which has regional impacts, the impacts of CO are localized in nature.

Nitrogen Dioxide

NO_2 is a brownish, highly reactive gas that is present in all urban environments. The major human-made NO_2 sources are combustion devices, such as boilers or turbines, and internal combustion engines, such as automobile or generator engines. Combustion devices emit primarily nitrogen oxide (NO), which reacts through oxidation in the atmosphere to form NO_2. Nitrogen oxide and NO_2 are collectively referred to as NO_x. As NO_2 is formed and

Table 3.7-1: Summary of Ambient Air Quality Standards and Attainment Designations (SFBAAB and Alameda County)

Pollutant	Averaging Time	California Standards (CAAQS)		National Standards (NAAQS)[a]		
		Standards[b,c]	Attainment Status[d]	Primary[c,e]	Secondary[c,f]	Attainment Status[g]
Ozone (O_3)	8-hour	0.070 ppm (137 μg/m^3)	**Nonattainment**	0.075 ppm (147 μg/m^3)	Same as Primary	**Nonattainment**
	1-hour	0.09 ppm (180 μg/m^3)	**Nonattainment**	-	-	-
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	None	Attainment
	1-hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	None	Attainment
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm (339 μg/m^3)	Attainment	0.100 ppm (188 μg/m^3)	None	Unclassified
	Annual	0.030 ppm (57 μg/m^3)	-	0.053 ppm (100 μg/m^3)	Same as Primary	Attainment
Sulfur Dioxide (SO_2)	24-hour	0.04 ppm (105 μg/m^3)	Attainment	0.14 ppm (365 μg/m^3)	-	Attainment
	1-hour	0.25 ppm (655 μg/m^3)	Attainment	0.075 ppm (196 μg/m^3)	-	Attainment
	Annual	-	-	0.03 ppm	-	Attainment
Particulate Matter (PM_{10})	Annual	20 μg/m^3	**Nonattainment**	–	Same as Primary	Unclassified
	24-hour	50 μg/m^3	**Nonattainment**	150 μg/m^3	Same as Primary	Unclassified
Fine Particulate Matter ($PM_{2.5}$)	Annual	12 μg/m^3	**Nonattainment**	15 μg/m^3	Same as Primary	Attainment
	24-hour	-	-	35 μg/m^3	Same as Primary	**Nonattainment**
Lead (Pb)	30-day Average	1.5 μg/m^3	-	-	-	Attainment
	Quarterly	-	-	1.5 μg/m^3	-	Attainment
	Rolling 3-month Average	-	-	0.15 μg/m^3	-	-

Notes: ppm = parts per million; μg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter

[a] National standards (other than ozone, particulate matter, and those standards based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m^3 is equal to or less than 1 day. For $PM_{2.5}$, the 24-hour standard is attained when 98 % of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The NO_2 standard is attained when the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area does not exceed 0.100 ppm (effective January 22, 2010).

[b] California standards for ozone, CO (except Lake Tahoe), NO_2, and particulate matter are not to be exceeded. All others are not to be equaled or exceeded.

[c] Concentrations are expressed first in units in which they were issued (i.e., ppm or μg/m^3). Equivalent units given in parentheses are based on a reference temperature of 25 degrees Celsius (°C) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] Unclassified (U): The data are incomplete and do not support a designation of attainment or nonattainment.
Attainment (A): The State standard for that pollutant was not violated at any site in the area during a 3-year period.
Nonattainment (N): There was at least one violation of the State standard for that pollutant in the area.

[e] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[f] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[g] Nonattainment (N): Any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.
Attainment (A): Any area that meets the national primary or secondary ambient air quality standard for the pollutant.
Unclassifiable (U): Any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

Sources: ARB, 2009b, 2012a; EPA, 2011; BAAQMD, 2010b

depleted by photochemical reactions in the atmosphere, NO_2 concentrations in a particular geographical area may not be representative of the local NO_x emissions sources.

Sulfur Dioxide

SO_2 is a colorless, extremely irritating gas or liquid. It enters the atmosphere as a pollutant mainly as a result of burning sulfur contained in fuel oils and coal and from chemical processes occurring at chemical plants and refineries. Sulfur dioxide is subsequently converted to sulfates (SO_4) in the atmosphere and, like O_3, has peak annual concentrations in the summer months.

Respirable Particulate Matter and Fine Particulate Matter

PM_{10} and $PM_{2.5}$ consist of extremely small, suspended particles or droplets 10 microns and 2.5 microns or smaller in diameter, respectively. Some sources of particulate matter, like pollen, forest fires, and windblown dust, are naturally occurring. However, in populated areas, most particulate matter is caused by road dust, combustion products, abrasion of tires and brakes, and construction activities. Particulate matter can also be formed in the atmosphere by chemical conversion of NO_x, SO_2, and ROG.

Lead

Pb occurs in the atmosphere as particulate matter. Historically, the combustion of leaded gasoline was the primary source of airborne lead in the Bay Area, though the use of leaded gasoline is no longer permitted for on-road motor vehicles. Other sources of lead include the manufacturing and recycling of batteries, paint, ink, ceramics, ammunition, and secondary lead smelters.

Local Air Basin Attainment Status

As identified in Table 3.7-1, Alameda County and the SFBAAB are designated nonattainment for:

- O_3 (8-hour) CAAQS and NAAQS standards;
- O_3 (1-hour) CAAQS standard;
- PM_{10} (annual and 24-hour) CAAQS standards;
- $PM_{2.5}$ (annual) CAAQS standards; and
- $PM_{2.5}$ (24-hour) NAAQS standards.

The SFBAAB and Alameda County is in attainment for all other CAAQS and NAAQS standards, including CO, NO^2, SO_2, the NAAQS 1-hour $PM_{2.5}$ standard; and it is unclassified for the PM_{10} NAAQS standards and the 1-hour NAAQS NO_2 standard. In addition, the SFBAAB is a maintenance area for the federal CO standards (EPA, 2012).

Existing Emissions and Sources of Criteria Pollutants

Criteria air pollutants are monitored at several monitoring stations throughout the SFBAAB. The monitoring station closest to the VA Transfer Parcel is located in West Oakland. This monitoring station measures ozone,

NO_2, CO, PM_{10}, $PM_{2.5}$, and toxics (including hexavalent chromium). In general, the ambient air quality measurements from this station are representative of the air quality in the vicinity of Alameda Point. A summary of the air quality data from the most recent 3 years for which data are available (2008–2010) is included in Appendix F (Air Quality and Greenhouse Gas Supporting Information). During this period, there were no measured violations of the State 1-hour or 8-hour ozone standards. The State CO and NO_2 standards were also not exceeded in any of the last 3 years. The State 24-hour PM_{10} standard was not exceeded on any days during the 3-year period; however, the $PM_{2.5}$ national standard was exceeded multiple times in 2009.

Sources of criteria pollutants in Alameda County include area, stationary, and mobile sources. Mobile sources are the greatest contributors of CO, NOx, and $PM_{2.5}$ in Alameda County, contributing about half of the ROG emissions. Stationary and area wide sources are also substantial contributors of ROG emissions (from solvent cleaning, consumer products, and architectural coatings), while area wide and mobile sources are the greatest contributors of PM_{10} (from construction and demolition, paved road dust, and cooking) (ARB, 2009c).

VA Transfer Parcel

Existing sources of criteria pollutant emissions on the VA Transfer Parcel are limited to vehicles and construction equipment associated with maintenance, security, and short-term activities, such as activities associated with the management of the CLT colony. No permitted stationary sources of criteria pollutants are associated with the VA Transfer Parcel.

Surrounding Area

Existing sources of emissions adjacent to or near the VA Transfer Parcel include industrial equipment, space heating equipment, and vehicles associated with interim reuse activities at Alameda Point; remediation activities undertaken by the Navy; ships and industrial activities at the Port of Oakland; and marine vessels in San Francisco Bay and the Oakland Estuary. The closest permitted stationary off-site source is Delphi Productions Inc., located approximately 1,500 feet from the southeastern-most portion of the VA Transfer Parcel.

There are no major roadways near the project site (i.e., those carrying more than 10,000 vehicles per day, per BAAQMD guidance). The maximum hourly traffic volume at affected intersections east of the VA Transfer Parcel and VA Development Area is approximately 3,121 vehicles per hour during p.m. peak hours at the intersection of 5th Street and Broadway. This vehicle volume is far less than the volume of vehicles that could result in a CO hotspot at a nearby intersection (approximately 44,000 vehicles per hour); therefore, there is little potential for CO hotspots at or near the VA Transfer Parcel and VA Development Area (BAAQMD, 2010a).

Hazardous Air Pollutants

Air quality regulations also address localized HAPs, which are also called TACs. Like criteria pollutants, TACs may be emitted by stationary, area, or mobile sources; unlike criteria pollutants, TACs may also originate from indoor, non-combustion sources (e.g., building materials and consumer products like pesticides, cleaning solvents). Common stationary sources of TAC (and $PM_{2.5}$) emissions include gasoline stations, dry cleaners, and diesel backup generators, which are subject to local air districts' permit requirements. The other, often more important, sources of TACs (and $PM_{2.5}$) emissions are motor vehicles on freeways, high-volume roadways, or other areas with high numbers of diesel vehicles such as distribution centers. Off-road mobile sources include

construction equipment, ships, and trains. The EPA and ARB have ongoing programs to identify and regulate TACs. Among the many substances identified as TACs are asbestos, lead, and diesel exhaust particulates (which contain hundreds of TACs). TACs generally are regulated through statutes and rules that require the use of MACT or BACT to limit TAC emissions.

VA Transfer Parcel

No stationary sources of TACs exist near the VA Transfer Parcel, and very minor amounts of heavy truck trips or other mobile sources of diesel PM are associated with current operation of these areas.

Surrounding Area

Of the TACs for which data are available in California, diesel PM, benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene pose the greatest ambient risks (ARB, 2009a). Diesel PM poses the greatest health risk among these 10 TACs, making up 79% of the 2007 State-wide health risk (ARB, 2009a). Health risks associated with diesel PM are expected to drop by the year 2020 with implementation of EPA's Highway Diesel Rule and ARB's heavy-duty vehicle regulations and Diesel Risk Reduction Plan (ARB, 2009a).

Sources in the SFBAAB emit an estimated 4,151 tons of diesel PM each year, or approximately 12% of the diesel PM emissions in California (ARB, 2009a). Overall, levels of most TACs have decreased in the SFBAAB since 1990 (ARB, 2009a). Several stationary sources of TACs exist in Alameda County; one such source, Delphi Productions, is located approximately 1,500 feet east of the VA Transfer Parcel (BAAQMD, 2012). Also, the Port of Oakland, which generates TAC emissions associated with daily operational activities, is located approximately 5,300 feet north of the VA Transfer Parcel (BAAQMD, 2012).

Odors

Odor is considered an air quality issue in the context of NEPA, both at the local level (e.g., odor from wastewater treatment) and at the regional level (e.g., smoke from wildfires). Odors are generally regarded as an annoyance rather than a health hazard. The ability to detect odors varies considerably among the population and is subjective.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. *Intensity* refers to the strength of the odor. Odor intensity depends on the odorant concentration in the air. Examples of common land use types that generate substantial odors include wastewater treatment plants, landfills, composting/green-waste facilities, recycling facilities, petroleum refineries, chemical manufacturing plants, painting/coating operations, rendering plants, and food packaging plants.

VA Transfer Parcel

There are no known odor sources within the VA Transfer Parcel.

Surrounding Area

A search of ARB databases was conducted by standard industrial classification code for permitted stationary sources that could also generate odors (ARB, 2011). There are no known major odor sources near the VA Transfer Parcel.

Existing Sensitive Receptors

Some members of the population (e.g., children, elderly, persons with respiratory or cardiovascular illness, and athletes and others who engage in frequent exercise) are especially sensitive to emissions of air pollutants and should be given special consideration when evaluating air quality impacts from projects. Structures that house these persons or places where they gather are defined as sensitive receptors, and include residences, schools, daycare centers, playgrounds, parks, and healthcare facilities (including hospitals and nursing homes).

Residential areas are considered sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposures to any pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Exercise places a high demand on respiratory functions, which can be impaired by air pollution even though exposure periods during exercise may be short. In addition, noticeable air pollution can detract from the enjoyment of recreation. Commercial and industrial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent because most workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public.

VA Transfer Parcel

No sensitive receptors (residences, healthcare facilities, clinics, parks, or schools) are located within the VA Transfer Parcel.

Surrounding Area

No sensitive receptors (residences, healthcare facilities, clinics, parks, or schools) are located in close proximity of the VA Transfer Parcel. The nearest sensitive receptors are residents approximately 3,700 feet east of the VA Transfer Parcel along Pan Am Way.

3.7.3 Environmental Consequences

Assessment Methods

Construction Emissions

Alternative 1 and Alternative 2 propose the same development (i.e., VHA OPC, VBA Outreach Office, Conservation Management Office, NCA Cemetery, and associated infrastructure) and would require similar construction activities. However, the VA Transfer Parcel would be larger under Alternative 2 and would require slightly more fill material than Alternative 1. Therefore, construction emissions were modeled using Alternative 2 as the more conservative estimate.

Construction emissions of criteria pollutants were modeled using URBEMIS2007 (URBEMIS), Version 9.2.4 computer program (Rimpo, 2011). Cemetery construction phasing information was provided by VA. Assumptions about construction equipment (type and number) to be used on site, when not available from project-specific sources, were determined based on URBEMIS defaults. VA provided assumptions about heavy-duty haul truck trips for building material delivery, soil import, and other miscellaneous construction materials, as well as vehicle trips by construction workers. Trips by on-road vehicles (i.e., heavy-duty haul trucks and construction worker vehicles) were modeled using EMFAC2011, ARB's motor-vehicle emissions inventory model (ARB, 2012). Emissions from EMFAC2011 were added to URBEMIS to calculate the total construction emissions associated with construction activities. Construction emissions were estimated on an annual basis and then converted to average annual emissions by dividing the total construction emissions by the number of construction years (i.e., 1.5 years or 18 months).

Construction under both Alternative 1 and 2 would take approximately 18 months to complete and would include development of the VHA OPC and associated parking on 20 acres; access road and utilities infrastructure on 11 acres; the Conservation Management Office; and the first phase of the cemetery development on an estimated 20 acres of the 80-acre cemetery area. Construction activities would include grading and excavation, trenching, building construction, asphalt paving, and application of architectural coatings. Construction activities for all proposed components (i.e., OPC, the Conservation Management Office, the cemetery facilities, and infrastructure) have been assumed to start simultaneously in 2015. All components would require initial site grading activities to various extents. Overall, it is anticipated that initial construction would require the import of approximately 444,000 cubic yards for both Alternative 1 and Alternative 2 of fill material to the VA Development Area.

Construction of subsequent phases of the cemetery would involve development of an additional 6 acres of cemetery (beginning in approximately 2026) approximately every 10 years. Based on this phasing schedule, the final phase of the cemetery would be constructed around the year 2116. Each phase of cemetery development would require the import of approximately 62,400 cubic yards of fill material; construction would last approximately 12 months. Construction is anticipated to be less intensive under the individual phases of cemetery expansion. Development of the subsequent cemetery phases would occur during full operation of the VHA OPC, Conservation Management Office, and existing NCA cemetery.

Accordingly, to account for all emissions-generating scenarios under both Alternative 1 and 2, it was assumed that emissions from subsequent cemetery phase construction activities would be comparable to the average annual emissions from the initial site construction. However, subsequent cemetery phase annual emissions likely would be less than the average annual emissions from initial construction, for multiple reasons. The intensity of construction activities for subsequent cemetery phases would be less than that for initial construction, and construction emission rates from vehicles and heavy-duty construction equipment would decrease with time because of fleet turnover and new emissions technology.

No indirect construction emissions of criteria pollutants would occur other than those associated with incidental electricity use during project construction; however, emissions associated with grid-based power would already be accounted for within the SFBAAB's air quality plans and California's SIP.

No construction activities would occur under the No Project Alternative; therefore, no modeling was performed for the No Project Alternative.

Data supporting the air quality analysis, including modeling assumptions and projections are included in Appendix F (Air Quality and Greenhouse Gas Supporting Information).

Operational Emissions

For Alternatives 1 and 2, direct operational area emissions of criteria pollutants were modeled using the URBEMIS2007 computer program (Rimpo, 2011). URBEMIS2007 estimates daily and annual operational emissions for area sources (e.g., natural gas combustion, periodic architectural coatings, landscape maintenance) and mobile sources (e.g., vehicle trips to and from the project site) based on the type and amount of land uses to be built. The traffic study prepared for this EA was used to obtain estimates of motor vehicle trips associated with the proposed land uses; see Section 3.3 (Transportation, Traffic, Circulation, and Parking) and Appendix D (Transportation Impact Study) (AECOM, 2012). Lastly, although it is anticipated that the Proposed Project would be fully built out by 2116, this analysis evaluates full buildout of the cemetery in year 2035.

It should be noted that emissions related to electricity that would use grid-based power delivery were not included, because these emissions would already be accounted for in the SFBAAB's air quality plans and California's SIP, discussed previously. As a result, no indirect effects are expected with operation of the proposed VA facilities that have not already been accounted for in regional and State air quality management plans. Data supporting the air quality analysis, including modeling assumptions and projections are included in Appendix F (Air Quality and Greenhouse Gas Supporting Information).

Under the No Action Alternative, the fed-to-fed transfer would not take place and the proposed development (e.g., VHA OPC, VBA Outreach Office, NCA Cemetery, etc.) would not be built. Therefore, no net change in operational emissions would occur, and no modeling was conducted for the No Action Alternative.

General Conformity Review

As identified above, Alameda County and the SFBAAB is a designated nonattainment area for O_3 (8-hour) CAAQS and NAAQS standards; O_3 (8-hour) CAAQS standards; PM_{10} (annual and 24-hour) CAAQS standards; $PM_{2.5}$ (annual) CAAQS standards; and $PM_{2.5}$ (24-hour) NAAQS standards. In addition, the SFBAAB is a maintenance area for the federal CO standards (EPA, 2012). Therefore, since VA's Proposed Action (as identified in the following analysis) would result in the emission of one or more of these nonattainment or maintenance area criteria air pollutants, a review has been conducted for the each of the EA Alternatives to determine if the VA's Proposed Action is subject to the General Conformity Rule. The SFBAAB and Alameda County is in attainment for all other CAAQS and NAAQS standards, including CO, NO^2, SO_2, the NAAQS 1-hour $PM_{2.5}$ standard; and it is unclassified for the PM_{10} NAAQS standards and the 1-hour NAAQS NO_2 standard. Therefore no further review of these criteria air pollutants is required.

A federal action is except from the General Conformity Rule requirements if the action's total net emissions are below the *de minimis* threshold (see Table 3.7-2), are not regionally significant (i.e., emissions would exceed 10 % of an area's total emissions), or are otherwise exempt per 40 CFR 51.153. If net emissions exceed the relevant *de minimis* value, or if a project is regionally significant, a formal conformity determination process must be

Table 3.7-2: General Conformity Rule *de minimis* Thresholds (SFBAAB)

Nonattainment and Pollutant	Pollutant to be Controlled	*de minimis* Threshold (tons/year)[e]
O_3	NO_X	100[b]
	VOC/ROG	50[b]
CO	CO	100[a]
PM_{10}	PM_{10}	–[c]
$PM_{2.5}$	$PM_{2.5}$	100[d]

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases; VOC = volatile organic compound
[a] Attainment/maintenance area for CO.
[b] Marginal nonattainment area for 8-hour ozone precursors: NO_X and VOC.
[c] The SFBAAB is unclassifiable for PM_{10}.
[d] Nonattainment area for $PM_{2.5}$ (EPA, 2006).
[e] Annual emissions based on 365 days per year, assuming average daily emissions.
Source: Title 40, Part 93 of the Code of Federal Regulations; BAAQMD, 2008

followed. Total net emissions include direct and indirect emissions from all stationary point and area sources, construction sources, and/or mobile sources caused by the federal action that are not covered by another permitting program.

To determine if the VA's Proposed Action's total net emissions are below the *de minimis* threshold, total construction and operational emissions were projected for each EA Alternative (excluding the No Action Alternative) and compared against the *de minimis* threshold and area's total emissions. A discussion of the applicability of the General Conformity Rule is included under each alternative section below. Data supporting the air quality analysis, including modeling assumptions and projections are included in Appendix F (Air Quality and Greenhouse Gas Supporting Information).

The Navy's Proposed Action, the transfer of surplus federal property, is exempt from the General Conformity Rule, under the provisions of 40 32 CFR 93.153(c)(2)(xix), which identifies the conformity rule does not apply to federal actions that involve the transfer of ownership, interests, and titles of land, facilities, and real and personal properties, regardless of the form or method of transfer.

Alternative 1

Construction

Criteria Air Pollutants

Air quality impacts from proposed construction activities would occur from combustive emissions due to the use of fossil fuel-fired construction equipment and on-road trucks and fugitive dust (PM_{10}/$PM_{2.5}$) emissions from earth-moving activities, and the use of vehicles on bare soils. Construction related emissions would be short-term

and primarily occur within the boundaries of the VA Development Area. The average annual emissions projected from construction under Alternative 1 are shown in Table 3.7-3.

Table 3.7-3: Summary of Modeled Annual Emissions of Criteria Air Pollutants and Precursors Associated with Construction Activities (Alternative 1 and 2)

	Average Annual Emissions (tons/year)[a]				
	CO	**NO_X**	**VOC/ROG**	**PM_{10}**	**$PM_{2.5}$**
Construction Activities	7.3	20.2	2.7	16.0	3.6
***de minimis* Threshold**	100	100	50	–	100

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases; VOC = volatile organic carbon
[a] Details of annual construction emissions, input parameters used in the modeling, and detailed modeling output, may be found in Appendix F.
[b] Average annual emissions were calculated by dividing the total construction emissions by 1.5 years, which is the total construction period.
[c] Facility operational emissions presented are representative of full site operational emissions in year 2017, which provides a conservative estimate of operational emissions that would occur during subsequent cemetery phase construction activities.

The largest amount of construction under Alternative 1 would occur during initial construction, at which point all of the buildings would be constructed and the first phase of the cemetery development. Therefore, during each of the subsequent phases of cemetery expansion, the impact of emissions of criteria pollutants related to cemetery construction would be similar to or less than the impact identified for Alternative 1 in 2017.

All construction activities would meet applicable State and federal air quality regulations and pollution control requirements to prevent exceedance of air quality standards during construction. In addition, to minimize any potential air quality effects during construction, VA would implement best management practices and agency environmental controls, including VA's *Section 01 57 19: Temporary Environmental Controls*. These may include, but are not limited, to dust control measures and limiting idling of vehicles and equipment.

Construction-related emissions of criteria air pollutants from Alternative 1 construction would be less than *de minimis* thresholds. Therefore, there would be no significant construction-related impact on criteria air pollutants.

Hazardous Air Pollutants

Initial construction of Alternative 1 would include mass site grading, trenching, building construction, asphalt paving, and application of architectural coatings. Most construction phases would involve the use of diesel-fueled construction equipment, except during the application of architectural coatings. Diesel particulate matter (diesel PM) has been classified as a TAC by ARB. Therefore, construction-related emissions of diesel PM have the potential to affect nearby sensitive receptors.

The BAAQMD has developed the *Screening Tables for Air Toxics Evaluation during Construction* (BAAQMD, 2010c). If sensitive receptors are located within applicable screening distances, additional evaluation of potential health risks is warranted to determine the level of impact that would occur. For a commercial project with

100,000–300,000 square feet of construction (Alternative 1 and 2 propose approximately 160,500 square feet of building construction), the offset distance required for combined risk with age-sensitivity factor (to account for early life exposures) is 656 feet from the project fence line to ensure that the impact on a sensitive receptor would be minor TAC.

The closest sensitive receptors to the VA Development Area are residences located at the corner of 1st Street and West Midway Avenue, approximately 5,500 feet east of the proposed development area, outside of the BAAQMD screening distance of 656 feet. In addition, VA would implement applicable best management practices to control dust and emissions from construction (e.g. watering exposed surfaces, covering haul trucks, transporting soil and loose materials, limiting vehicle speeds on unpaved surfaces). Therefore, construction-related impacts of localized TAC and PM emissions on sensitive receptors would not be significant and additional evaluation (i.e., BAAQMD screening criteria) of potential health risks is not needed.

Odors

Construction of the facilities and cemetery expansions under Alternative 1 could result in odors (e.g., from diesel exhaust emitted by equipment); however, these odors would be temporary and intermittent. Emissions would occur only during business hours during the construction period, and would disperse quickly given the area's meteorological conditions (i.e., high-wind area with annual average winds of approximately 7 mph) (BAAQMD, 2010d). In addition, the nearest sensitive receptors are located 3,700 feet from the fence line of the VA Transfer Parcel and approximately 5,500 feet from where the bulk of construction activities (construction of the OPC and the first 18 acres of cemetery uses) would occur. Thus, even during intensive construction activities (i.e., soil import activities), because of the distance between the nearest receptor and the VA Transfer Parcel and the area's high winds, there would be no significant construction-related impact from odors.

Operation

Criteria Air Pollutants

Proposed operations would generate criteria pollutant emissions from onsite area sources (such as combustion of natural gas for space and water heating and other fuels for building and grounds maintenance equipment) and vehicles that access the project site. As discussed previously under "Assessment Methods," URBEMIS estimates area-source emissions associated with land use projects based on the amount (e.g., square feet or acres) and type of land use. For mobile-source emissions, the project's traffic study (Appendix D) was used to evaluate the trip generation of each proposed land use.

The annual emissions associated with Alternative 1 operational area-source and mobile-source activities in the year 2017 are presented in Table 3.7-4. As discussed above, operational emissions in the year 2017 would represent the highest level of operational emissions of criteria air pollutants and ozone precursors. As discussed and presented above, Table 3.7-4 also presents the Alternative 1 operational emissions added with subsequent phase cemetery construction emissions to demonstrate that future emissions also would not exceed the General Conformity Rule *de minimis* thresholds.

Table 3.7-4: Summary of Modeled Maximum Annual Emissions of Criteria Air Pollutants and Precursors Associated with Operational Activities (Alternative 1 and 2)

Source	Average Annual Emissions (tons/year)[a]				
	CO	NO_X	VOC/ROG	PM_{10}	$PM_{2.5}$
Operational Activities	27.0	3.3	2.4	7.0	1.3
Subsequent Cemetery Expansion (Construction)	7.3	20.2	2.7	16.0	3.6
Total	34.3	23.5	5.1	23.0	4.4
***de minimis* Threshold**	100	100	50	–	100

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases; VOC = volatile organic carbon
[a] Details of annual construction and operational emissions, including input parameters used in the modeling and detailed modeling output, may be found in Appendix F.
[b] The operational emissions for Alternative 1 would also occur simultaneously with construction-related emissions for subsequent cemetery phases under Alternative 1, as shown in Table 3.7-7.
Source: Modeling performed by AECOM in 2011

Annual operational emissions in year 2017 under Alternative 1 would not exceed any of the *de minimis* thresholds (Table 3.7-2). In addition, following the occupation and operation of the initial phase of development, subsequent expansion of the cemetery would occur. During this time construction emissions would be occurring from the cemetery expansion in addition to the ongoing operational emissions. When combined, the operational and constructions emissions (see Figure 3.7-4) would also not exceed any of the *de minimis* thresholds. Therefore, there would be no significant operational-related impact on criteria air pollutants.

In addition, the proposed project's full buildout operating scenario was modeled assuming full buildout by year 2035. As discussed above, is anticipated that future emissions would tend to be less due to turnover in vehicle fleets and new emissions technology. It should be noted that full project buildout is anticipated to occur in year 2116. Therefore, the emissions shown in Table 3.7-5 represent the maximum emissions that could occur with full buildout of Alternative 1.

Table 3.7-5: Summary of Modeled Maximum Annual Emissions of Criteria Air Pollutants and Precursors Associated with Operational Activities (Alternative 1 and 2), Full Buildout

Source	Average Annual Emissions (tons/year)[a]				
	CO	NO_X	VOC/ROG	PM_{10}	$PM_{2.5}$
Full Buildout[b] Operation	42.0	3.8	3.8	22.2	4.2
***de minimis* Threshold**	100	100	50	–	100

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases; VOC = volatile organic carbon
[a] Details of annual construction and operational emissions, including input parameters used in the modeling and detailed modeling output, may be found in Appendix F.
[b] Full buildout is anticipated to occur in 2116; however, emissions presented have been modeled for 2035 for a conservative estimate. It is anticipated that emissions presented are the maximum emissions that could occur at any point in project operations.
Source: Modeling performed by AECOM in 2011

As shown in Table 3.7-5, year 2035 full build-out emissions would also be below the *de minimis* thresholds. The operational impact on regional air quality of criteria air pollutant emissions during full buildout of Alternative 1 would not be significant.

Localized Carbon Monoxide Emissions

The construction and operation of Alternative 1 would add vehicle traffic to local roadways that would contribute to vehicle volumes at local intersections. Congestion at local intersections is the main cause of CO hotspots, which are associated with a localized exceedance of the CAAQS or NAAQS. Although the operational analysis evaluated the EA Alternatives for 2016 conditions because of the higher emission factors in 2016, it is more conservative to evaluate 2035 operational conditions, which results in the highest contribution of vehicles to local intersections. Therefore, if Year 2035 cumulative conditions plus operations under Alternative 1 would not result in a potential CO hotspot, it is highly unlikely that Alternative 1, year 2016 or year 2026 conditions would result in a CO hotspot.

A BAAQMD developed screening threshold allows project proponents to evaluate whether the contribution of their projects to local roadways could potentially cause CO hotspots. The hotspot screening level recommended by BAAQMD is 44,000 vehicles per hour at any given intersection. This screening threshold has been developed using conservative assumptions such as stable meteorological conditions and older emission factors.

Projected traffic volumes resulting from implementation of Alternative 1 identified that the maximum number of vehicles traveling through a study intersection under 2035 Cumulative Plus Project conditions would be 4,574 vehicles at 5th Street and Broadway under P.M. peak-hour conditions (see Section 3.3 [Transportation, Traffic, Circulation, and Parking]). Because this volume is substantially less than the screening level of 44,000 vehicles per hour, operational activities associated with Alternative 1 would not be expected to contribute or cause CO concentrations that would exceed the CAAQS or NAAQS. Accordingly, the direct operational impact of Alternative 1 related to localized CO emissions would not be significant.

As discussed above, the 2035 operational conditions under Alternative 1 would result in the maximum number of vehicle trips and highest volume on local roads. Traffic from operational activities under subsequent cemetery construction phases would be included in this intersection and vehicle volume modeling. Therefore, the subsequent cemetery buildout in combination with operational activities would not contribute or cause CO concentrations that would exceed the CAAQS or NAAQS. The direct operational impact of subsequent cemetery buildout related to localized CO emissions would not be significant.

Through 2116, for each of the subsequent phases of cemetery construction under Alternative 1, vehicle volumes in the project region and associated with the VA Development Area are projected to increase. However, it is not likely that vehicle volumes would increase to a point where the potential for a CO hotspot would occur (i.e., nine times the intersection volume of 2035 Plus Project volumes). In addition, it is anticipated that CO emissions from motor vehicles would continue to decrease with time because of turnover in the vehicle fleet and the availability of new emissions technology. Therefore, subsequent cemetery phase construction is not anticipated to contribute or cause CO concentrations that would exceed the CAAQS or NAAQS. The operational impact of subsequent cemetery phase construction related to localized CO emissions would not be significant.

Hazardous Air Pollutants

Operation of Alternative 1 would not include TAC sources that would expose nearby receptors to substantial TAC concentrations. Therefore, impacts of localized TAC and PM emissions on sensitive receptors would not be significant

Odors

The land uses proposed for the VA Transfer Parcel under Alternative 1 are not land uses that would typically generate substantial concentrations of odors. Therefore, it is unlikely that the operation of Alternative 1 would expose sensitive receptors to substantial odor concentrations. The operational impact of Alternative 1 related to odor exposure would not be significant.

General Conformity Review

As shown in Tables 3.7-3, 3.7-4, 3.7-5, and 3.7-6 construction- and operation-related emission increases for O_3, CO, PM_{10}, and $PM_{2.5}$ (i.e., project area nonattainment or maintenance area criteria air pollutants) would be less than the General Conformity Rule *de minimis* thresholds and are less than 10% of the projected regional emissions, and therefore not regionally significant and a full conformity determination is not required. Table 3.7-6 presents the Alternative 1 and Alternative 2 construction, operational plus subsequent cemetery expansion, and full buildout operation emissions compared with 10% of the region's projected annual emissions. A Record of Non-Applicability (RONA) has been prepared for this action and is included in Appendix F (Air Quality and Greenhouse Gas Supporting Information).

Table 3.7-6: Summary of Modeled Maximum Annual Emissions of Criteria Air Pollutants and Precursors Associated with Construction, Operational Plus Subsequent Cemetery Expansion, and Full Buildout Operational (Alternative 1 and 2)

Source	Average Annual Emissions (tons/year)[a]				
	CO	NO_X	VOC/ROG	PM_{10}	$PM_{2.5}$
Construction	7.3	20.2	2.7	16.0	3.6
Operational Plus Subsequent Cemetery Expansion	34.3	23.5	5.1	23.0	4.4
Full Buildout Operation[b]	42.0	3.8	3.8	22.2	4.2
10% of Bay Area Regional Emissions[c]	54,750	14,600	10,914	5,402	2,592
***de minimis* Threshold**	100	100	50	–	100

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases; VOC = volatile organic carbon

[a] Details of annual construction, operational and construction, and full buildout emissions, including input parameters used in the modeling and detailed modeling output, may be found in Appendix F.

[b] Full buildout is anticipated to occur in 2116; however, emissions presented have been modeled for 2035 for a conservative estimate. It is anticipated that emissions presented are the maximum emissions that could occur at any point in project operations.

[c] Daily emissions projected by BAAQMD were multiplied by 365 days to estimate annual emissions, which were multiplied by 10% to calculate the 10% criteria for conformity evaluation. As discussed above, USEPA has removed this criterion from their General Conformity Rule. However, the analysis for regional significance has been included for a conservative analysis.

Source: Modeling performed by AECOM in 2011; BAAQMD, 2011

As shown in Table 3.7-6, the project's construction, operational plus subsequent cemetery expansion, and full buildout emissions would not exceed any *de minimis* thresholds or 10% of the region's projected emissions. Thus, Alternative 1 and 2 would not be considered regionally significant and a full conformity determination is not required.

Alternative 2 (Preferred Alternative)

Construction

Alternative 2 would involve similar development as planned for Alternative 1 (i.e., VHA OPC, VBA Outreach Office, Conservation Management Office, NCA Cemetery, and associated infrastructure. As discussed above under "Assessment Methodology," both Alternative 1 and Alternative 2 propose construction of the same amount of developed land uses on the project site, but in different locations. Therefore, similar amounts of construction equipment and numbers of material delivery trucks and construction workers would be required for Alternative 2 construction.

Soil import required for Alternative 2 would be greater than that required for Alternative 1. Therefore, construction parameters (e.g., amount of soil hauling) for Alternative 2 were used to model construction emissions for both Alternative 1 and Alternative 2 (Tables 3.7-3). Although the site configuration for Alternative 2 would differ from that for Alternative 1, the emissions of criteria air pollutants, ozone precursors, TACs, and odors would be comparable to those of Alternative 1.

Criteria Air Pollutants

Alternative 2 would generate emissions that are comparable to those of Alternative 1, as shown in Table 3.7-4 and 3.7-5. Construction-related emissions of criteria air pollutants from Alternative 2 construction would be less than *de minimis* thresholds. Therefore, there would be no significant construction-related impact on criteria air pollutants.

Hazardous Air Pollutants

The construction of VA facilities under Alternative 2 would be similar to that under Alternative 1. Therefore, construction-related impacts of localized TAC and PM emissions on sensitive receptors would not be significant and additional evaluation (i.e., BAAQMD screening criteria) of potential health risks is not needed.

Exposure to Odors

The odor impact associated with Alternative 2 would be similar to that of Alternative 1. The two alternatives would involve construction of the same type of facilities with the similar land use; therefore, construction activities, equipment, and timing for Alternative 2 would be similar to that for Alternative 1. Accordingly, Alternative 2 would not involve additional odor-generating construction activities (e.g., diesel exhaust emissions). Therefore, the construction-related odor impact of Alternative 2 would not be significant.

Operation

The activities that would occur during operation of the proposed VA facilities under Alternative 2 would be identical to those occurring under Alternative 1. The proposed site layout in the VA Development Area under Alternative 2 would differ from that under Alternative 1; however, the vehicle trips and area-source intensities, which most contribute to air pollutant emissions, are anticipated to be similar to those of Alternative 1.

Criteria Air Pollutants

The annual operational emissions associated with Alternative 2 would be lower than the *de minimis* thresholds (see Table 3.7-4 and 3.7-5). Therefore, there would be no significant operational-related impact on criteria air pollutants.

Localized Carbon Monoxide Emissions

The analysis and impact of Alternative 2's contribution to potential CO hotspots would be similar to those for Alternative 1. Therefore, no significant operational impact to localized CO emissions would occur.

Hazardous Air Pollutants

The analysis and impact of Alternative 2 associated with localized TAC and PM emissions would be similar to those for Alternative 1. Therefore, the direct impact of Alternative 2 related to localized TAC and PM emissions would not be significant.

Odors

The analysis and impact of Alternative 2 in terms of odor would be similar to those for Alternative 1. Therefore, the impact of Alternative 2 related to odor emissions would not be significant.

General Conformity Review

As shown in Tables 3.7-3, 3.7-4, 3.7-5, and 3.7-6, construction- and operation-related emission increases for O_3, CO, PM_{10}, and $PM_{2.5}$ (i.e., project area nonattainment or maintenance area criteria air pollutants) would be less than the General Conformity Rule *de minimis* thresholds and are less than 10% of the projected regional emissions, and therefore not regionally significant and a full conformity determination is not required. A RONA has been prepared for this action and is included in Appendix F (Air Quality and Greenhouse Gas Supporting Information).

No Action Alternative

Construction

Under the No Action Alternative, no construction activities would take place; thus, there would be no emissions of criteria pollutants, TACs, PM, or odors. Therefore, no significant construction-related impact on air quality would occur.

Operation

Under the No Action Alternative, no operational emissions from VA facilities would be generated. Therefore, there would be no significant operational impact on air quality.

3.7.4 References

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3.8 GREENHOUSE GAS EMISSIONS

This section describes the existing physical and regulatory setting related to climate change and greenhouse gas (GHG) emissions and discusses the potential effects of the EA Alternatives related to GHG emissions.

3.8.1 Regulatory Framework

Council on Environmental Quality (CEQ) Draft NEPA Guidance on Consideration of Effects of GHG Emissions and Climate Change

On February 18, 2010 the CEQ proposed for the first time draft guidance on how federal agencies could evaluate the effects of climate change and GHG emissions for NEPA documentation (CEQ 2010). Specifically, if a proposed action emits 25,000 MT of CO_2e or more on an annual basis, agencies could consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. CEQ does not propose this reference point as an indicator of a level of GHG emissions that may significantly affect the quality of the human environment, but notes that it serves as a minimum standard for reporting emissions under the CAA.

In the analysis of the direct effects of a proposed action, the CEQ proposes that it would be appropriate to: 1) quantify cumulative emissions over the life of the project; 2) discuss measures to reduce GHG emissions, including consideration of reasonable alternatives; and 3) qualitatively discuss the link between such GHG emissions and climate change. However, the CEQ states that it is not currently useful for the NEPA analysis to attempt to link specific climatological changes or environmental impacts to proposed GHG emissions, as such direct linkage is difficult to isolate and to understand.

Executive Order 13514, "Federal Leadership in Environmental, Energy, and Economic Performance"

EO 13514 requires GHG management and each federal agency must comply with the regulations including reporting to the CEQ Chair and Office of Management and Budget (OMB) Director and establishing the target, considering reductions associated with reducing agency building energy intensity, increasing agency renewable energy use and on-site projects, and reducing agency use of fossil fuels. VA has completed the aforementioned EO 13514 requirements in the form of the VA Strategic Sustainability Performance Plan (SSPP), described in detail below. The VA SSPP would be adhered to with implementation of the chosen EA Alternative.

VA Strategic Sustainability Performance Plan

The VA SSPP responds to Section 8 of EO 13514, which requires federal agencies to "develop, implement, and annually update an integrated Strategic Sustainability Performance Plan that will prioritize agency actions" for meeting sustainability goals identified in statutes, regulations, and executive orders. The VA SSPP identifies VA's sustainability goals and defines VA's policy and strategy for achieving these goals (VA, 2010).

By FY 2020, VA is targeting a 29% reduction in GHG emissions below the FY 2008 baseline. A 26% reduction in emissions is projected to come from meeting the FY 2015 alternative fuel use, petroleum reduction, energy intensity reduction, and on-site renewable electricity targets as set forth in the Energy Policy Act of 2005.

Facility-level and regional strategies include energy conservation measures, retro-commissioning, installation of alternative fueling stations, and on-site renewable electricity generation. Projects funded at the department level include additional alternative fueling stations as well as additional on-site renewable electricity generation through technologies such as solar and renewably fueled combined heat and power.

For FY 2020, VA has set a GHG emissions reduction target of 10% below the FY 2008 baseline. VA is relying on a combination of strategies and technology advances that include meeting existing targets (such as energy intensity and pollution prevention); improving fuel economy based on Corporate Average Fuel Economy standards; implementing innovative commuting strategies; and developing an action plan that will address non-commuting emissions, such as telework and alternate work schedules.

3.8.2 Greenhouse Effect, Global Warming, and Climate Change

As Earth absorbs high-frequency solar radiation, its surface gains heat and then re-radiates lower frequency infrared radiation back into the atmosphere.[1] Some solar radiation is also reflected by the atmosphere back toward space. Most solar radiation passes through the atmosphere; however, infrared radiation is selectively absorbed by GHGs. Specifically, GHGs affect the radiative forcing of the atmosphere,[2] which in turn affects Earth's average surface temperature. This phenomenon, the greenhouse effect, keeps the earth's atmosphere near the surface warmer than it would be otherwise and allows successful habitation by humans and other forms of life.

Increases in GHGs lead to increased absorption of infrared radiation by Earth's atmosphere and thus increased temperatures and evaporation rates near the surface. Variations in natural phenomena such as volcanoes and solar activity produced most of the global temperature increase during preindustrial times; however, increasing atmospheric GHG concentrations resulting from human activity have been responsible for most of the observed global temperature increase.[3] With the accelerated increase of fossil fuel combustion and deforestation since the Industrial Revolution of the 19th century, concentrations of GHGs have increased exponentially in the atmosphere. This enhanced greenhouse effect has contributed to global warming, an increased rate of warming of Earth's average surface temperature.[4] Global warming affects global atmospheric circulations and temperatures; oceanic circulations and temperatures; wind and weather patterns; average sea level; ocean acidification; chemical reaction rates; precipitation rates, timing, and form; snowmelt timing and runoff flow; water supply; wildfire risks; and other phenomena. The manner in which it affects all these phenomena is commonly referred to as climate change.

Intergovernmental Panel on Climate Change Temperature Prediction

The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization and United Nations Environment Programme to assess scientific, technical, and socioeconomic

[1] Frequencies at which bodies emit radiation are proportional to temperature. Earth has a much lower temperature than the sun and emits lower frequency (longer wavelength) radiation than the high-frequency (short wavelength) solar radiation emitted by the sun.

[2] This is the change in net irradiance at the tropopause after allowing for stratospheric temperatures to re-adjust to radiative equilibrium, but with surface and tropospheric temperatures and state held fixed at the unperturbed values.

[3] These basic conclusions have been endorsed by more than 45 scientific societies and academies of science, including all of the national academies of science of the major industrialized countries. Since 2007, no scientific body of national or international standing has maintained a dissenting opinion.

[4] This is the result of Earth having to work harder to maintain its radiation budget, because (under the condition of more GHGs in the atmosphere) Earth must force emission of additional infrared radiation out into the atmosphere.

information relevant to the understanding of climate change, its potential impacts, and options for adaptation and mitigation. Warming of the climate system is now considered to be unequivocal (IPCC, 2007a), with global surface temperature increasing approximately 1.33 degrees Fahrenheit (°F) over the last 100 years. The IPCC predicts increases in global average temperature of between 2° and 11°F over the next 100 years (depending on scenario) (IPCC, 2007b).

Greenhouse Gases and Global Emission Sources

Prominent naturally occurring GHGs in Earth's atmosphere are water vapor, CO_2, methane, nitrous oxide, and ozone (O_3). Anthropogenic (i.e., human-caused) emissions include additional releases of these GHGs plus releases of human-made, high global warming potential gases (high GWP gases) (sulfur hexafluoride [SF_6], PFCs, HFCs, and ozone-depleting substances [ODSs]) into Earth's atmosphere. Water vapor, although the most abundant GHG, is not discussed below because natural concentrations and fluctuations far outweigh anthropogenic influences. Ozone is not included because it does not directly affect radiative forcing. ODSs, which include chlorofluorocarbons, halons, carbon tetrachloride, methyl chloroform, and hydrochlorofluorocarbons, are not included, because they have been primarily replaced by HFCs and PFCs. The other GHGs are discussed below.

Each GHG has a different potential for contributing to global warming. The most commonly accepted method to compare GHG emissions is the global warming potential (GWP) (IPCC, 2001). The IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of carbon dioxide equivalents (CO_2e), which compares the gas in question to that of the same mass of CO_2 (CO_2 has a GWP of 1 by definition). As such, a high GWP represents high infrared radiation absorption and long atmospheric lifetime compared to CO_2. One must also select a time horizon to convert GHG emissions to equivalent CO_2 emissions to account for chemical reactivity and lifetime differences among various GHG species. The standard time horizon for climate change analysis is 100 years. Generally, GHG emissions are quantified in terms of metric tons (MT) of CO_2e emitted per year. By far the largest component of worldwide CO_2e is CO_2 emissions, followed by methane, nitrous oxide, and high GWP gases in order of decreasing contribution to CO_2e.

Carbon Dioxide

The most important anthropogenic GHG is CO_2, accounting for more than 75% of all anthropogenic GHG emissions. Its long atmospheric lifetime (on the order of decades to centuries) ensures that atmospheric concentrations of CO_2 will remain elevated for decades after GHG mitigation efforts to reduce GHG concentrations are promulgated (Olivier et al., 2005, 2006 in IPCC 2007c. Increasing concentrations of CO_2 in the atmosphere are largely attributable to emissions from the burning of fossil fuels, gas flaring, cement production, and land use changes. Three quarters of the current radiative forcing is likely caused by anthropogenic CO_2 emissions that are the result of fossil fuel burning (and to a very small extent, cement production), and approximately one quarter of the current radiative forcing is the result of land use change (IPCC, 2007d). The concentration of CO_2 has increased from about 280 ppm to 379 ppm over the last 250 years, an increase of more than 35% (IPCC, 2007d). The IPCC estimates that the present atmospheric concentration of CO_2 has not been exceeded in the last 650,000 years and is likely to be the highest ambient concentration in the last 20 million years (IPCC, 2007b). The other GHGs of concern in order of their contribution to CO_2e are included in Table 3.8-1.

Table 3.8-1: Characteristics of GHGs in Order of Contribution to CO2e

Greenhouse Gas	GWP	Source	Preindustrial Concentration	Recent Concentration
Methane	21	growing rice, raising cattle, combusting natural gas, and mining coal (NOAA, 2008)	715 ppb	1,775 ppb (2005)
Nitrous Oxide	310	agricultural processes (fertilizer use and microbial processes in soil and water), nylon production, fuel-fired power plants, nitric acid production, vehicle emissions, rocket engines, racecars, and as an aerosol spray propellant	270 ppb	319 ppb (2005)
HFCs	140 to 11,700	human-made chemicals used in commercial, industrial, and consumer products, and as substitutes for ODSs in automobile air conditioners and refrigerants	0 ppT	0.5 -14 ppT (2000)
PFCs	7,390 to 17,700	human-made chemicals are emitted largely from aluminum production and semiconductor manufacturing processes	0 ppT	70 ppT (2000)
Sulfur Hexafluoride	23,900	human-made chemical used as an electrical insulating fluid for power distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a trace chemical for study of oceanic and atmospheric processes (EPA, 2006)	0 ppT	4.2 ppT (1998)

Note:
CO_2e = carbon dioxide equivalent; GWP = global warming potential; ppb = parts per billion; ppT = parts per trillion; HFCs = hydroflurocarbons; PFCs = perfluorocarbons
Source: Data compiled by AECOM, 2012

Global Climate Change Issue

Climate change is a global problem because GHGs are global pollutants with long atmospheric lifetimes (several years to several thousand years). Whereas criteria air pollutants and hazardous air pollutants are pollutants of regional and local concern with relatively short atmospheric lifetimes (about one day). The GHGs persist in the atmosphere long enough to be dispersed around the globe. Although the exact lifetime of any particular GHG molecule depends on multiple variables and cannot be pinpointed, more CO_2 is currently emitted into the atmosphere than is sequestered (CO_2 sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through photosynthesis and dissolution, respectively). Of the total annual human-caused CO_2 emissions, approximately 54% is sequestered through ocean uptake, Northern Hemisphere forest regrowth, and other terrestrial sinks within a year, whereas the remaining 46% of human-caused CO_2 emissions remain stored in the atmosphere (Seinfeld and Pandis, 1998).

The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; suffice it to say that the quantity is enormous, and no single project would be expected to measurably contribute to a noticeable incremental change in the global average temperature, or to global, local, or microclimate. Emissions of GHGs have the potential to adversely affect the environment, because such emissions contribute, on a cumulative basis, to global climate change.

Global climate change has the potential to result in sea level rise (resulting in flooding of low-lying areas), to affect rainfall and snowfall (leading to changes in water supply), to affect temperatures and habitats (affecting biological resources and public health), and to result in many other adverse environmental consequences. Although the international, national, State, and regional communities are beginning to address GHGs and the potential effects of climate change, it is expected that worldwide GHG emissions will continue to rise over the next several years.

Climate and Topography

Climate is the accumulation of daily and seasonal weather events over a long period of time, whereas weather is defined as the condition of the atmosphere at any particular time and place (Ahrens, 2003). For a detailed discussion of climate and topography, see Section 3.2 (Air Quality).

3.8.3 Affected Environment

Existing Greenhouse Gas Emissions

The effects of GHG emissions are by nature global and cumulative impacts, as individual sources of GHG emissions are not large enough to have an appreciable effect on global atmospheric GHG concentrations or climate change. Therefore, the impact of proposed GHG emissions to climate change is also discussed in the context of cumulative impacts in Chapter 4 of this EA.

U.S. Greenhouse Gas Inventory

Total U.S. GHG emissions in 2007 were 1.4% above the 2006 total (DOE, 2008). Figure 3.8-1 presents 2007 U.S. GHG emissions, including percentages, by type of gas.

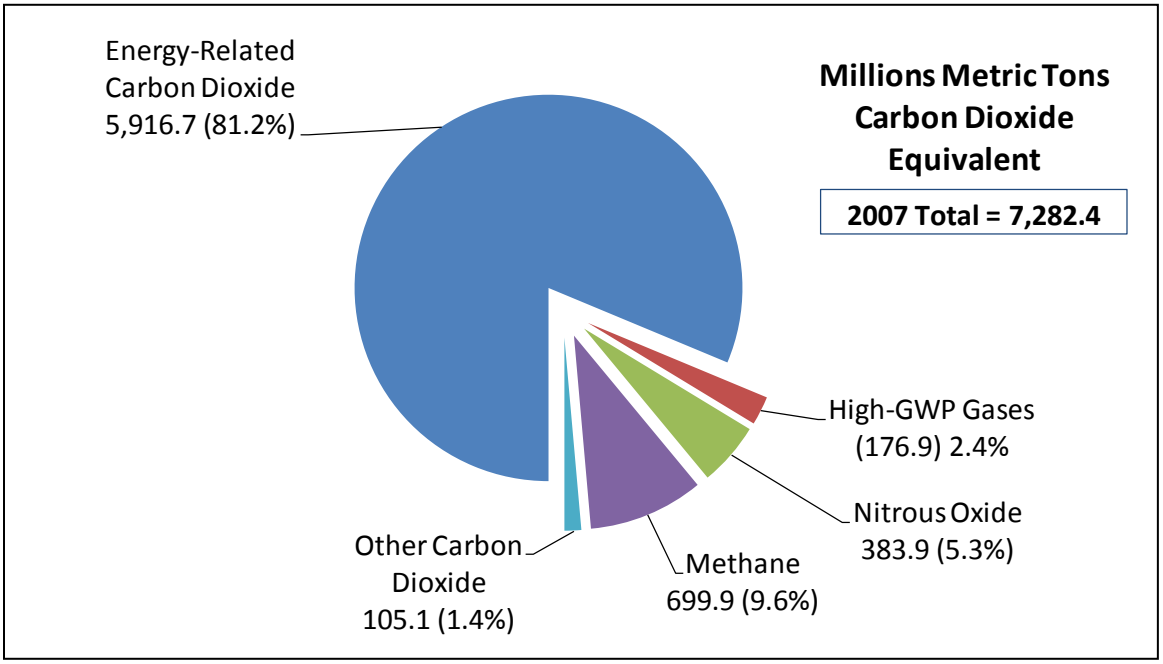
Total emissions growth—from 7,179.7 million metric tons carbon dioxide equivalent ($MMTCO_2e$) in 2006 to 7,282.4 $MMTCO_2e$ in 2007—was largely the result of an increase in CO_2 emissions of 75.9 $MMTCO_2e$. There were larger percentage increases in emissions of other GHGs, but their absolute contributions to total emissions growth were relatively small: 13.0 $MMTCO_2e$ for methane, 8.2 $MMTCO_2e$ for nitrous oxide, and 5.6 $MMTCO_2e$ for high-GWP gases (DOE, 2008).

California Greenhouse Gas Inventory

As the second largest emitter of GHG emissions in the U.S. and 12th to 16th largest in the world, California contributes a significant quantity of GHGs to the atmosphere (CEC, 2006). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (ARB, 2010) (Figure 3.8-2). Emissions of methane and nitrous oxide are generally associated with anaerobic microbial activity resulting from agricultural practices, flooded soils, and landfills.

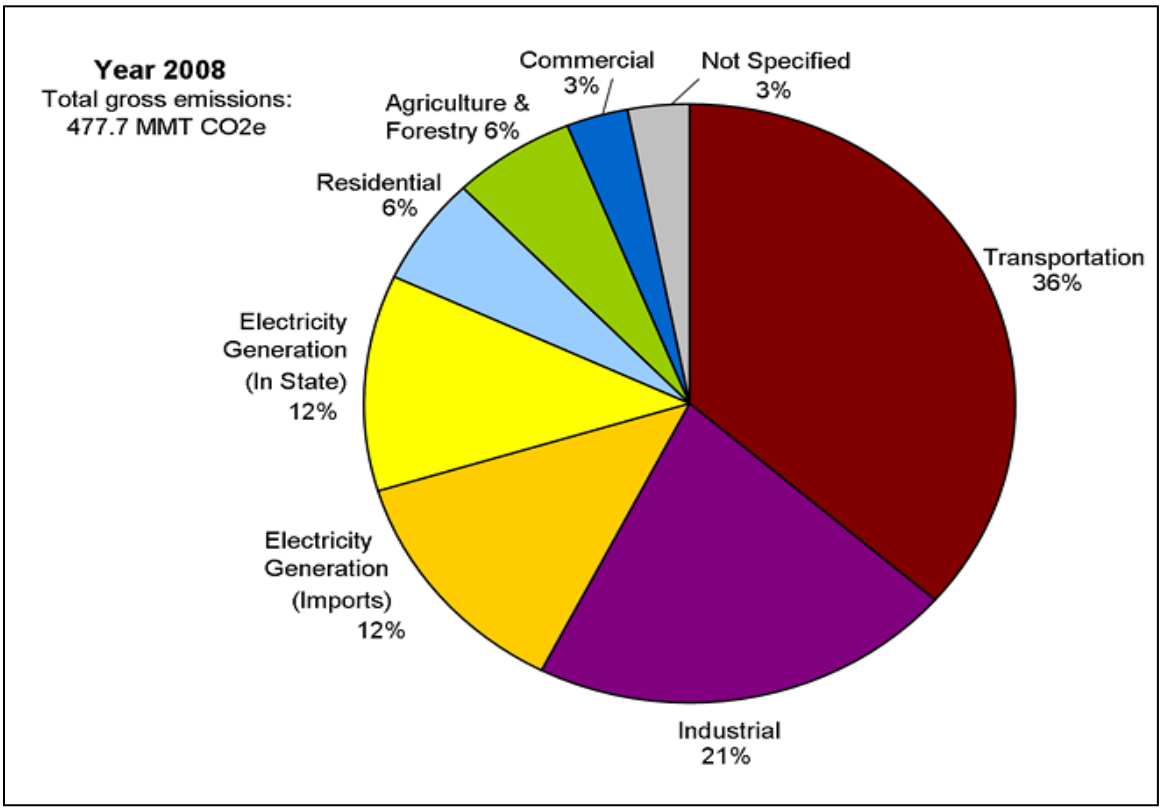
BAAQMD Greenhouse Gas Inventory

The BAAQMD published a GHG inventory for the Bay Area, which provides an estimate of GHG emissions in the base year 2007 for all seven counties located in BAAQMD's jurisdiction: Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, Napa, and the southern portions of Solano and Sonoma Counties (BAAQMD,



Source: DOE, 2008.
Note: High global warming potential gases include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride .

Figure 3.8-1: 2007 U.S. Greenhouse Gas Emissions by Gas



Source: ARB, 2010

Figure 3.8-2: 2008 California Greenhouse Gas Emissions by Sector (2000–2008 Emissions Inventory)

2010). This GHG inventory is based on the standards for criteria pollutant inventories and is intended to support BAAQMD's climate protection activities. The regional

Bay Area and local (county, project location) 2007 GHG emissions from existing direct and indirect sources are shown in Table 3.8-2. The estimated GHG emissions are presented in CO_2e, which weights each GHG by its GWP. The GWPs used in the BAAQMD inventory are from the Second Assessment Report of the IPCC.

Table 3.8-2: 2007 Estimated Regional and Local Greenhouse Gas Emissions

Emissions Source	Emissions in Metric Tons of CO_2e per Year (2007)	
	Bay Area	**Alameda County**
Transportation	34,870,000 (36.41%)	8,400,000
Industrial/Commercial	34,860,000 (36.40%)	3,300,000
Electricity/Cogeneration[1]	15,200,000 (15.87%)	2,000,000
Residential Fuel Usage	6,820,000 (7.12%)	1,300,000
Off-Road Equipment	2,920,000 (3.05%)	600,000
Agricultural/Farming	1,110,000 (1.16%)	100,000
Total Emissions	**95,780,000 (100%)**	**15,700,000**

Note:
CO_2e = carbon dioxide equivalent
[1] Includes imported electricity emissions of 7,100,000 metric tons of carbon dioxide equivalent.
Source: BAAQMD, 2010

In 2007, Alameda County GHG emissions accounted for about 16.3 % of the total Bay Area GHG emissions (BAAQMD, 2010). Transportation is the largest GHG emissions sector in the Bay Area and in Alameda County proper, followed by industrial/commercial, electricity generation and cogeneration, and residential fuel usage.

Sea Level Rise

With respect to the VA Transfer Parcel, the most critical climate change problem is the potential for a substantial increase in mean sea level (msl). Such a rise may result from a combination of (a) the volumetric expansion of existing seawater as water temperatures rise substantially and (b) the increase in total (liquid) seawater as large ice deposits on land (e.g., in Antarctica, in Greenland, and worldwide in large glaciers) melt into the sea. Sea level rise refers to an increase in msl with respect to a land benchmark. Local sea level rise is affected by global sea level rise plus geotectonic land mass movements and subsidence.

Atmospheric pressure, ocean currents, and local ocean temperatures also affect local rates of sea level rise. Sea level has risen approximately 400 feet since the peak of the last Ice Age about 18,000 years ago, but the bulk of that occurred before 6,000 years ago (Axelrod, 1981). From 3,000 years ago to the start of the 19th century, the rate of sea level rise was held almost constant; however, rates of sea level rise appeared to increase worldwide in the 20th century (e.g., 8.4 inches per century or 4.2 inches every 50 years near San Francisco). In the last century, the measured rate of sea level rise near San Francisco is 8.4 inches per century or 4.2 inches every 50 years.

Most climate scientists agree that global warming will cause the sea level rise to increase. In 2001, the IPCC released a report with projections of global sea level rise over the next century. More recent studies project

different rates of sea level rise for specific regions of the globe. These regional projections are considered more reliable on a region-by-region basis than the IPCC projections. The IPCC model range of estimates for global sea level average rise by 2060 is predicted to be between 2.4 and 15.6 inches. However, the models used by the IPCC do not predict uniform global sea level rise, and there are substantial regional variations. The IPCC model predictions for the eastern Pacific indicate a range of sea level rise of 3.6 to 19.2 inches by 2100, which is on the lower end of the global range noted above. Assuming net rise between 1990 and 2060 to be half of the net rise between 1990 and 2100, the geographic prediction for 2060 from the IPCC models for the eastern Pacific would be 1.8 to 9.6 inches.

The Delta Vision Blue Ribbon Task Force established by Governor Schwarzenegger to develop a management plan for the Sacramento–San Joaquin Delta employed an independent science board to review literature and provide recommendations on sea level rise. Based on their findings, the Independent Science Board recommended adopting an estimated rise in sea level of 55 inches by 2100. California Climate Action Team–funded research for the 2009 California Climate Adaptation Strategy Report estimates that sea level rise will increase in California between 12 and 16 inches by 2050 and between 20 and 55 inches by 2099 (BCDC, 2009). In addition, the California Department of Water Resources supports a range in sea level rise of 7 to 55 inches along California's coast by 2100 (DWR, 2008). Furthermore, the most recent climate science report, the 2009 Copenhagen Diagnosis, estimates that global sea level rise will increase up to approximately 78.7 inches by 2100 (Allison et al., 2009).

VA Transfer Parcel and VA Development Area

The topography of the VA Transfer Parcel and the VA Development Area is primarily flat and rises from 0 msl to approximately 10 feet above msl (CH2M Hill, 2011).

3.8.4 Environmental Consequences

Assessment Methods

To estimate GHG emissions associated with construction of individual development components, URBEMIS 2007, Version 9.2.4 (URBEMIS), a land use emissions model approved by the California Air Resources Board, was used. The BAAQMD Greenhouse Gas Model (BGM) model was used to estimate operational GHG emissions. URBEMIS is designed to model construction emissions for individual development components based on building size, land use and type, and disturbed acreage and allows for the input of project-specific information. BGM was developed for use with URBEMIS, and calculates operational GHG emissions associated with a project at buildout. Operational emissions calculated include those resulting from transportation (trip generation), electricity use, natural gas use, solid waste generation, water and wastewater use, and other area sources (hearth and landscaping).

Construction-generated GHG emissions were modeled based on the Alternatives and default BAAQMD-recommended settings and parameters attributable to the proposed land use type and site location. URBEMIS only provides estimates of emissions of CO_2. Although emissions of other GHGs, such as methane and nitrous oxide, are important with respect to global climate change, the emission levels of these other GHGs from on- and

off-road vehicles used during construction are about two to three orders of magnitude smaller than CO_2 emissions, even when factoring in the relatively larger GWPs of methane and nitrous oxide (CCAR, 2009).

The GHG emissions associated with the operation of the EA Alternatives were modeled using BGM Version 1.1.9 beta, with default Bay Area values for temperature, humidity, and vehicle fleet characteristics as well as rates of energy consumption, waste generation, water use, and wastewater generation for various land uses. All modeling assumptions and output summaries are contained in Appendix F (Air Quality and Greenhouse Gas Emissions Data).

As identified, the CEQ proposed for the first time draft guidance on how federal agencies could evaluate the effects of climate change and GHG emissions for NEPA documentation (CEQ 2010). Specifically, if a proposed action emits 25,000 MT of CO_2e or more on an annual basis, agencies could consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. CEQ does not propose this reference point as an indicator of a level of GHG emissions that may significantly affect the quality of the human environment, but notes that it serves as a minimum standard for reporting emissions under the CAA. Therefore, this EA identifies if projected GHG emissions associated with the Proposed Action are below or above the proposed reference point of 25,000 MT of CO_2e. The potential effects of proposed GHG emissions are by nature global and cumulative in their impacts, since individual sources of GHG emissions are not large enough to have an appreciable effect on climate change. Therefore, an appreciable impact on global climate change would only occur when proposed GHG emissions combine with GHG emissions from other human-made activities on a global scale. Since GHG emissions from the Proposed Action in combination with other non-project actions in the region would equate to such a minimal amount of the U.S inventory, they would not be expected to substantially contribute to global climate change.

Global Climate Change

The impacts of global climate change on the EA Alternatives are described in terms of sea level rise, because local/regional projections of specific climate change effects (such as regionally downscaled versions of global climate models) that have been developed for the Bay Area are limited to sea level rise and corresponding inundation areas. Scientific findings related to sea level rise for the EA Alternatives are summarized and discussed below. Thus, this section includes an overview of the potential impacts of the EA Alternatives in the context of global climate change related to sea level rise, and the potential impact associated with the effect of an alternative in the context of sea level rise is determined based on proposed land development elevations in comparison to BCDC's findings on sea level rise inundation for San Francisco Bay.

Alternative 1

Construction

GHG missions resulting from the initial phase of construction (i.e., VHA OPC, VBA Outreach Office, Conservation Management Office, first phase of NCA National Cemetery, and associated infrastructure) would total 4,422 MT of CO_2e. Emissions related to construction of subsequent phases of the NCA Cemetery would total 2,948 MT of CO_2e per occurrence through 2116 (see Table 3.8-3). Daily GHG emissions would vary over this time depending on the intensity of construction activities each day. Thus, construction activities would not

Table 3.8-3: Construction Greenhouse Gas Emissions (Metric Tons of Carbon Dioxide Equivalent) (Alternative 1 and 2)

	Grading	Trenching	Building Construction	Asphalt Paving	Arch. Coating	Truck Emissions	SOV Emissions	TOTAL
Initial Phase of Construction	545	71	321	132	3	3,000	351	4,422
Subsequent Phases of Cemetery Expansion	364	47	214	87	2	2,000	234	2,948

Notes:
Arch. = Architectural; SOV = Single Occupancy Vehicle
Emissions may not appear to add exactly due to rounding.

exceed the CEQ reference point of 25,000 MT of CO_2e, which serves as a minimum standard for reporting emissions under the CAA.

Operation

Under full buildout, Alternative 1 total GHG operational emissions would total 7,301 MT of CO_2e per year. Mobile-source emissions related to the operation of the VA facilities would total 3,567 MT of CO_2e per year. Area-source and indirect emissions (e.g., electricity, natural gas, area sources, water, wastewater, and solid waste) associated with operation of the VA facilities would total 3,734 MT of CO_2e per year (see Table 3.8-4). Therefore, GHG emissions from operations would not exceed the CEQ reference point of 25,000 MT of CO_2e, which serves as a minimum standard for reporting emissions under the CAA.

Table 3.8-4: Operational Greenhouse Gas Emissions (Metric Tons of Carbon Dioxide Equivalent) per Year after Full Buildout (Alternative 1 and 2)

Transportation	Area	Electricity	Natural Gas	Water and Wastewater	Solid Waste	TOTAL
3,879	***312***	***1,048***	***711***	***27***	***1,636***	***7,613***

Notes:
CM = Conservation Management; OPC = Outpatient Clinic; VA SSPP = Department of Veterans Affairs Strategic Sustainability Performance Plan
Totals may not appear to add exactly due to rounding.
Source: Data calculations by AECOM in 2012 (Appendix F)

In addition, it should be noted that there would be periods when operational emissions associated with Alternative 1 facility operations and subsequent cemetery phase construction would occur simultaneously. In these situations, annual emissions associated with Alternative 1 could total up to 10,451 MT CO_2e. During this time, GHG emissions would still not exceed the CEQ reference point of 25,000 MT of CO_2e, which serves as a minimum standard for reporting emissions under the CAA.

Impact of Climate Change

Based on sea level rise predictions of 16 inches by 2050 and 55 inches by 2099 (BCDC, 2009), sea level rise could cause flooding in some of the coastal areas of Alameda Island, including the VA Transfer Parcel and the

VA Development Area. Specifically, under Alternative 1 the VA Development Area would be located in an area identified as potentially exposed to sea level rise of approximately 16 inches by 2050 and approximately 55 inches by 2099 (BCDC, 2011). However, as part of construction of VA facilities, the ground elevation would be raised to 12.5 feet above msl for the proposed roadways and to 13.5 feet above msl for the proposed VHA OPC, Conservation Management Office, and NCA Cemetery. Thus, the proposed development location would be at a higher elevation (12.5 to 13.5 feet above msl) than both the Pacific Ocean (0 feet above msl) and the high-end sea level rise prediction in 2099 (55 inches or 4.6 feet above msl). As a result, there would be no climate change–related sea level rise impacts at the proposed facilities in the VA Development Area under Alternative 1 through the year 2099. Therefore, the Proposed Action would be prepared for inevitable environmental changes that are anticipated to occur from climate change, and climate change thus is not anticipated to result in harm to persons or property or degradation of natural resources or ecosystems at the VA Transfer Parcel. No impact is expected to occur on the proposed development related to the potential effects of projected sea level rise.

Alternative 2 (Preferred Alternative)

Construction

Under Alternative 2, emissions related to construction would be similar to Alternative 1 (Table 3.8-3). Thus, construction activities would not exceed the CEQ reference point of 25,000 MT of CO_2e, which serves as a minimum standard for reporting emissions under the CAA.

Operation

Operational GHG emissions under Alternative 2 would be similar to those under Alternative 1. Therefore, all operational emissions would be the same as those shown in Table 3.8-5. Therefore, GHG emissions from operations would not exceed the CEQ reference point of 25,000 MT of CO_2e, which serves as a minimum standard for reporting emissions under the CAA.

Impact of Climate Change

Based on sea level rise predictions of 16 inches by 2050 and 55 inches by 2099 (BCDC, 2011), sea level rise could cause flooding in some of the coastal areas of Alameda Island, including the VA Transfer Parcel and the VA Development Area. Specifically, under Alternative 2 the VA Development Area would be located in an area identified as potentially exposed to sea level rise of approximately 16 inches by 2050 and approximately 55 inches by 2099 (BCDC, 2011). However, as part of construction of VA facilities, the ground elevation would be raised to 12.5 feet above msl for the proposed roadways and to 13.5 feet above msl for the proposed VHA OPC, Conservation Management Office, and NCA Cemetery. Thus, the proposed development location would be at a higher elevation (12.5 to 13.5 feet above msl) than both the Pacific Ocean (0 feet above msl) and the high-end sea level rise prediction in 2099 (55 inches or 4.6 feet above msl). As a result, there would be no climate change–related sea level rise impacts at the proposed VA facilities under Alternative 2 through 2099. Therefore, the proposed VA development under Alternative 2 would be prepared for inevitable environmental changes that are anticipated to occur from climate change, and thus, climate change is not anticipated to result in harm to persons or property or degradation of natural resources or ecosystems at the VA Transfer Parcel. No impact is expected to occur on the proposed development related to the potential effects of projected sea level rise.

No Action Alternative

Construction

Under the No Action Alternative, the fed-to-fed transfer would not take place, and no VA facilities would be constructed. Therefore, no impacts would occur.

Operation

Under the No Action Alternative, the fed-to-fed transfer would not take place, and no VA facilities would be operated on the property. The property would be retained by Navy in caretaker status until another action on the property is taken. Therefore, no operational-related impacts would occur.

Impact of Climate Change

Because there would be no VA development at Alameda Point that could be adversely affected by climate change under the No Action Alternative, no impact of climate change would occur.

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