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## Aesthetics

New development can substantially change the visual qualities and characteristics of an urban area. It may also have lasting effects on the evolution of the area by stimulating growth and increasing its attractiveness for additional residential development or other land uses. New development can change the character of an area by disrupting the visual and aesthetic features that establish the identity and value of an area for its existing residents. Loss of such identity and value may discourage new investment and negatively affect continued residency or business activity or other activities that attract visitors to the area.

The visual value of any given feature or geographic area may be subject to personal sensibilities and variations in individual reaction to the features of the area, with visual impressions varying from one person to another. Although clearly objective standards are difficult to establish, an extensive body of literature is devoted to the subject of urban design and visual aesthetics, and the County has adopted specific guidelines and standards for the Project area in the *Fairview Area Specific Plan* and in its *Scenic Route Element* (adopted respectively by the Alameda County Board of Supervisors, on September 4, 1997 and in May, 1966) that apply to the Project. In addition, the obstruction of important views available from public locations, the introduction of large or uncharacteristic uses or structures, or alteration of existing distinctive features are generally considered to represent potential conflicts with common aesthetic standards. The CEQA Guidelines require analyses to determine if a project would adversely affect scenic vistas, damage existing identifiable resources in a state scenic highway corridor, or substantially degrade the visual character or quality of a site and its surroundings.

To provide substantial evidence and a complete examination of the Project's potential effects on aesthetic values, photo-simulations depicting how the Project would appear in the future from various public vantage points are included in this chapter.

### Environmental Setting

The Fairview area of Alameda County consists of gently rising hillsides above downtown Hayward, with the neighborhoods characterized primarily by a mix of single-family residential development and large rural residential or undeveloped parcels served by several arterial roadways. Historically, Hayward and the hills to the north and east, including the Fairview area, were used for various forms of agriculture, with the hilly area primarily being used for cattle and horse grazing and for chicken farms. Over the past 20 to 30 years, more and more of the large formerly agricultural parcels have been developed with suburban-style residential subdivisions. Despite the proliferation of nearby residential subdivisions, the surrounding area still contains rural residential and agricultural or undeveloped properties of between one and ten acres, such as the 9.78-acre Project site, which is one of the larger undeveloped sites in the immediate vicinity. The residential developments in these hilly areas afford residents views downhill toward the Hayward and Castro Valley areas, San Francisco Bay, the San Francisco peninsula and the city skyline of San Francisco and up to Mount Tamalpais in Marin County. Conversely, views toward undeveloped hillsides are also considered aesthetically valuable where they are available. The hilly

topography, mature trees, natural vegetation and landscapes represent the primary visual resources and values in the vicinity of the Project.

### **Visual Character of the Site and Vicinity**

The Project sites lie on a long ridge formation that extends nearly four miles along the west side of the Five Canyons Open Space area and at the eastern edge of the older areas of Fairview. The ridge rises from the south near Don Pedro Reservoir and I-580 and continues south along Fairview Avenue to near the Stonebrae development. D Street extends through a small saddle in the ridge, providing access to development that is on easterly (or Five Canyons) side of the ridge such as the adjacent Machado and Thurston Court subdivisions. The crest of the hill on D Street between Fairview Avenue and its eastern terminus is centered on this ridge saddle, and the street serving Tract 8297 would connect to D Street at this crest. The ridge is only moderately prominent as the eastern horizon in the immediate Project area, but is much more noticeable in the Fairview area as it continues uphill and south through the Jelincic subdivision and beyond. The homes on Carlson Court north of the Project sites are directly on the ridge, and along with the homes on the uppermost ridge in the Jelincic subdivision, are visible from several points around Fairview as well as along D Street up to half a mile to the west.

The ridge traverses Tract 8297 from the hilltop (the site of proposed Lot 1) through the center of the Tract along the approximate line of the proposed street. The hilltop lies approximately 50 feet above the D Street hill crest, and along the eastern boundary of Tract 8297 descends roughly 20 feet to a saddle roughly halfway between the northeast and southeast corners. The southern boundary of Tract 8297 also ascends to a top elevation that matches the hilltop, but the ridge continues upward offsite to the south. The hilltop has been used as a horse pasture and has some horse stalls in a dilapidated building. Both sites consist of largely open grassland, with four homes, a few small outbuildings, and trees and shrubs that range widely in size from small to large. The largest trees are on the north and south peripheries, near D Street and the southern boundary, such as mature Monterey pines, cottonwood, oaks, eucalyptus and palms. Existing structures on the Project sites are not highly visible except from immediately adjacent locations along D Street; most of the upper site is out of view being both behind homes and properties along D Street and beyond the hilltop. In contrast, the open land of the lower site is easily viewed from D Street through to its southern boundary. The sites are almost completely out of view from any portion of Fairview Avenue. As viewed from D Street directly bordering the sites or the Cemetery, they may be characterized as rural residential and horse grazing or undeveloped land. Some of the larger trees on the sites are prominent in some views, especially from within the Lone Tree Cemetery. However, many of the trees visible from the Cemetery or other locations that appear to be on the sites are in fact on adjacent parcels.

## **Regulatory Setting**

### **State**

#### Caltrans Scenic Highway Program

California's Scenic Highway Program is administered by the California Department of Transportation (Caltrans). The Scenic Highway Program was created by the Legislature in 1963. Its purpose is to protect and enhance the natural scenic beauty of California highways and adjacent corridors, through special conservation treatment. A highway may be designated scenic depending upon how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. The State Scenic Highway System

includes a list of highways that are either eligible for designation as scenic highways or have been officially designated.

The closest state highway to the Project site is Interstate 580 (I-580), approximately one mile to the north. I-580, an east-west freeway through Castro Valley nearest the site, is designated as an “Eligible State Scenic Highway” but it has not been officially designated as such.<sup>1</sup> For this analysis, an “eligible” scenic highway is treated the same as a designated scenic highway.

## Local

### Scenic Route Element

The Alameda County General Plan includes a *Scenic Route Element* adopted in 1966 and which is still in effect. Its intended purpose is to “serve as a guide for establishment of programs and legislation dealing with the development of a system of scenic routes and the preservation and enhancement of scenic qualities and of natural scenic areas adjacent to and visible from scenic routes.”<sup>2</sup> The *Scenic Route Element* establishes three types of scenic routes, including freeways and expressways, thoroughfares and rural-recreation routes, and further divides their qualities into scenic “elements” or components: the right-of-way; the adjacent scenic corridor; and the areas beyond the corridor. These refer respectively to the foreground in public ownership, the middle ground of adjacent properties in highly urban areas or up to 1,000 feet distant in rural areas with high scenic quality, and the distant view or remaining portions of the County. The definition of the scenic corridor (or middle-ground) includes those areas “that are of sufficient scenic quality to be acquired by state or local jurisdictions, or areas to which development controls should be applied for purposes of preserving and enhancing relatively nearby views or maintaining unobstructed distant views along the scenic route...”<sup>3</sup>

The *Element* also suggests such corridors “should also include slope and utility easements, and in selected areas, public roadside rests, cycling, riding and hiking trails.” Lastly, within scenic corridors, “Development controls should be applied to preserve and enhance scenic qualities, restrict unsightly use of land, control height of structures, and provide site design and architectural guidance along the entire scenic corridor.”<sup>4</sup> Within developed areas of the County, the areas beyond the corridor are to be preserved primarily through the *Element’s* policies to preserve outstanding views, stands of trees, establish new landscaping and control location and types of utility towers and outdoor advertising signs.<sup>5</sup>

The *Scenic Route Element* includes a map of the roadway system, consistent with the major route types delineated in the Circulation Element of the County General Plan as it existed in 1966, with the three roadway classifications (freeways and expressways, major thoroughfares and major rural roads). The map has been interpreted to designate these major roads and highways as the scenic route system at large. Among the major rural roads in the scenic route system is Fairview Avenue (which would have been substantially more rural in character in 1966). However, as discussed further in the analysis section, the Project site is not substantially visible from Fairview Avenue.

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<sup>1</sup> California Department of Transportation, State Scenic Highway Mapping System, [http://www.dot.ca.gov/hq/LandArch/scenic\\_highways/index.htm](http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm)

<sup>2</sup> Scenic Route Element of the General Plan, Alameda County, May 1966, p. 1.

<sup>3</sup> Ibid., p. 4.

<sup>4</sup> Ibid., p. 4.

<sup>5</sup> Ibid., p. 4

### Fairview Area Specific Plan

The *Fairview Area Specific Plan*, adopted by the County Board of Supervisors in 1997, includes policies addressing a broad range of topic areas, including land use, residential density, open space, traffic, and specific environmental considerations (e.g., geology, drainage, public services, etc.). Policies that pertain to natural features generally call for retention of natural topography and other natural characteristics of sites within the Fairview Area, and define those existing visual and natural characteristics that should seek to be preserved as part of new development. Selected principles and guidelines relevant to visual qualities and aesthetic resources include the following:<sup>6</sup>

#### *Principles*

*D.2.a: All development proposals shall strive for maximum retention of the natural topographic features, landscape features, and qualities of the site. Development should seek to enhance these natural features and qualities.*

*D.2.b: All development proposals shall take into account and be judged by the application of current principles of land use planning, soil mechanics, engineering geology, hydrology, civil engineering, environmental and civic design, architecture, and landscape architecture in hill areas. Such current principles include but are not limited to:*

- 1) Planning of development to fit the topography, soils, geology, hydrology, and other conditions existing on the proposed site;*
- 2) Orienting development to the site so that grading and other site preparation is kept to a minimum;*
- 3) Shaping of essential grading to complement and blend with natural landforms and improve relationships to other developed areas;*
- 6) Landscaping of areas around structures, and blending them with the natural landscape;*
- 7) Placing, grouping and shaping of man-made structures to complement one another, the natural landscape, and provide visual interest;*
- 8) Locating building pads so that the views of prominent ridgelines are not interrupted or interfered with by buildings;*
- 9) Using a variety of housing types, housing clusters and special house construction techniques in residential areas to permit steep slopes, wooded areas, and areas of special scenic beauty to be preserved;*
- 10) Giving special consideration to the design of public and private streets to minimize grading and other site alteration;*
- 11) Giving special consideration to the design of such visual elements as street lighting, fences, sidewalks, pathways, and street furniture to enable maximum identity and uniqueness of character to be built into each development;*

#### *D.3. Guidelines*

- a. Natural and man-made slopes of 30% gradient or greater should not be developed or altered. Exceptions may be granted for road construction if it is the only feasible access*

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<sup>6</sup> *Fairview Area Specific Plan*, Adopted by the Alameda County Board of Supervisors, Sept. 4, 1997, pp. 10-12.

*to a site, modifications of minor terrain features, and custom designed homes and lots that otherwise conform to the intent of these policies.*

- b. Only individual lot grading<sup>7</sup> should occur in areas exceeding 20% slope.*
- c. Buildings should be designed with stepped, pier and grade beam, or a custom foundation to reduce grading, to avoid contiguous stair-stepped padded lots, and to retain a more natural appearance. On sloping lots, tall downhill facades should be avoided by stepping structures with the natural terrain.*
- d. The vertical height of a graded slope or combination retaining wall and slope between single-family dwellings should not exceed 10 feet in the rear yards, or 5 feet within a side yard between lots.*
- e. The maximum horizontal distance of graded slope should not exceed 20 feet, at 2:1 (horizontal to vertical) gradient.*
- f. Development near or on a prominent ridgeline should be subordinate to the surrounding environment. Residences should blend into the natural topography creating minimal visual disturbance to the existing ridgeline and views. Rows of residences with similar setbacks and elevations shall be discouraged.*

An assessment of the Project's consistency with these aesthetic-based design principles and guidelines of the Fairview Area Specific Plan is provided in Chapter 9: Land Use, of this Draft EIR.

## Impacts and Mitigation Measures

The following section describes potentially significant Project impacts to aesthetic resources. Mitigation measures are recommended where necessary to avoid, minimize or mitigate such impacts, where feasible.

### Significance Criteria

The Project would have a significant environmental impact if it were to:

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

### Scenic Vistas

**Aesth-1: Scenic Vistas.** The Project would not result in substantially altered views from identified scenic routes or public areas. Due to intervening topography, structures, and landscaping, the Project site is not substantially visible from Fairview Avenue, which represents the only identified scenic route in the area. There are no scenic vistas from parks or other public

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<sup>7</sup> The *Specific Plan* provides the following definition: "Individual lot grading is grading which can be wholly contained on a lot and which is necessary to fit the house, its access, and useful yard areas."

viewing locations from which the Project site is visible. Therefore, the impact of the Project on scenic vistas would not be significant. **(LTS)**

The Project would have a significant impact on a scenic vista if it were to result in obstruction of a designated public vista (such as one recognized in the General Plan or the *Fairview Area Specific Plan*), or the placement of an arguably offensive or negative-appearing building or land use within such a vista (e.g., blocking a scenic view of a landscape or feature that is recognized as valued in such a plan). Although the *Fairview Area Specific Plan* includes many policies regarding preservation and development of visual characteristics and qualities, it does not designate any specific scenic vistas but aims more towards preservation of existing natural qualities including topography, woodlands and riparian habitat.

Fairview Avenue is identified as a “major scenic rural-recreation route” in the County General Plan Scenic Route Element. However, due to the location of Fairview Avenue in relation to the Project site and the intervening topography, structures and landscaping, the Project site is not generally visible from Fairview Avenue except in brief, partial glimpses. Therefore, the Scenic Route Element’s standards related to Fairview Avenue would not be applicable to the Project. D Street is not designated as a scenic route.

#### *Photo-Simulations*

Photo-simulations of the Project have been prepared for this EIR based on selected viewpoints around the site, as shown in **Figure 4.1**. Vantage points from the west, south and east of the Project site were selected based on the site’s visibility. Existing and simulated depictions of future homes from the selected viewpoints are shown in **Figures 4.2** through **4.5** below.

- Viewpoint 1 shows the Project site from Lone Tree Cemetery, a private property but also a location for public gatherings.
- Viewpoint 2 shows the view into the western parcel from Carlson Court. The Carlson Court residential subdivision is very similar to the proposed Project in terms of house sizes and placement.
- Viewpoint 3 is a close-up view of the Project site. This view is looking directly at the site and at the Hilltop Convalescent Home, and shows how the existing grade interacts with this existing structure.
- Viewpoint 4 is a close-up view of the Project site and shows the existing structures and grades, looking up the hill from west to east along D Street.

As shown in the photo simulations, the site will look different after Project buildout. It will transition from its existing rural residential character to a suburban residential development. The site grade will look terraced rather than sloping, and more of the site will contain structures and paving. However, the proposed change is generally similar to the character of other existing residential development in the surrounding area.



**Figure 4.1**  
**Visual Simulation Viewpoint Locations**



Source: Environmental Vision, 2016



Existing view from Lone Tree Cemetery looking northeast



Visual simulation of proposed Project

**Figure 4.2**  
**Visual Simulation - Viewpoint 1**



Source: Environmental Vision, 2016





Existing view from Carlson Court looking southeast



Visual simulation of proposed Project

**Figure 4.3**  
**Visual Simulation - Viewpoint 2**



Source: Environmental Vision, 2016



Existing view from D Street near Carlson Court looking southeast



Visual simulation of proposed Project

**Figure 4.4**  
**Visual Simulation - Viewpoint 3**



Source: Environmental Vision, 2016



Existing view from D Street near northwest corner of Project site



Visual simulation of proposed Project

**Figure 4.5**  
**Visual Simulation - Viewpoint 4**



Source: Environmental Vision, 2016

- Viewpoint 1 (showing the Project site from Lone Tree Cemetery) is approximately a quarter mile from, and looking upward toward the Project site. From this viewpoint it can be seen that existing grassy slopes visible from this location would be graded and developed with new residential homes. The Project's new homes would generally be consistent in character with surrounding neighborhoods, and most similar to the homes on Carlton Court. The visual simulation from this viewpoint shows that, while homes will be visible on the ridgeline, existing structures are already visible along this ridgeline, including some of those structures that the Project will replace.
- Viewpoint 2 (from Carlson Court) shows views into the western parcel, demonstrating the change in character of the site from rural residential to suburban residential. No scenic vistas are visible from this viewpoint.
- Viewpoints 3 and 4 are close-up views from D Street, and demonstrate how the existing structures and grades will be replaced with proposed structures and grading. These simulations demonstrate that no scenic vistas are available from these viewpoints, and that the Project's new development would not obstruct and scenic vistas from these locations.

The Project would be considered to have a significant impact on a scenic vista if it were to result in the placement of a negative-appearing building or land use within a designated public vista, or would substantially block a vista from being seen from a public viewing location. The Lone Tree Cemetery can be considered a public gathering area or a public viewing location, and views across the undeveloped grassy hillsides on the Project site could constitute a public vista. As shown in the visual simulation from Viewpoint 1, the Project's new homes are not objectively negative-appearing, and would not substantially block the vista across the Project site as seen from the Cemetery. The Project would not result in a substantially altered view from identified scenic routes or public areas, and the impact would be less than significant.

#### Mitigation Measures

None needed.

### Scenic Highways

**Aesth-2: Scenic Highways.** The Project site is not distinctly visible from I-580, which is an eligible state scenic highway. The Project would not substantially obscure, detract from or negatively affect the quality of the views from I-580. **(LTS)**

The closest state highway to the Project site is I-580, located roughly one mile north of the site on a generally east-west alignment through Castro Valley. When viewed from eastbound lanes on I-580, intervening land forms, trees and urban development, as well as substantial distance make it nearly impossible to discern the Project site. When viewed from I-580, no trees, rock outcroppings or buildings on the site are visible.

#### Mitigation Measures

None needed.

### Visual Character

**Aesth-3: Visual Character.** The Project's visual character would be generally consistent with, or similar to other existing development in the area. The Project would not be demonstrably negative in its visual character, or otherwise significantly degrade the existing visual

character or quality of the site or its surroundings. The Project's impact on visual character would be less than significant. **(LTS)**

This assessment of visual character is intended to assess whether the Project is demonstrably negative in character. The proposed single-family subdivision would not be objectively negative in appearance, as might a wastewater treatment plant, a landfill or an industrial manufacturing plant. However, the criterion for analysis is not whether the Project is negative in appearance, but whether the physical changes represented by the Project would constitute a substantial degradation of the existing visual character or quality of the site and its surroundings.

- The Project is a proposed single-family lot residential subdivision that would be located on two sites that have other existing single-family residential subdivisions to the immediate east, north and west.
- The residential densities proposed under the Project comply with existing zoning for the property, and the proposed lot sizes and home sizes are generally consistent with lot sizes and home styles in the surrounding neighborhoods.
- The Project would result in development of a site that is currently in rural residential use, with low-density homes and outbuildings, and disturbed grassy hillsides. Prior to development of the surrounding residential neighborhoods in the vicinity, these neighborhoods were also more rural in character, with open grassy hillsides.
- The general character of the Project would consist of re-graded sites to accommodate new roads with a moderate slope, with new homes placed on generally flat pads (with some split-pad foundations) located along each side of the new roads. Ornamental landscaping and lawns would occupy the streetscape in front of the new homes. This general character of the Project is similar to and consistent with the general character of the residential neighborhoods in the Project site vicinity (see **Figures 4-6 and 4-7** showing images of the surrounding neighborhoods).

The Project would increase the number of residential structures on site and result in a change to the site's existing visual character, but that resulting character would not be substantially different than other surrounding properties and would not significantly degrade the visual character or quality of the site or its surroundings.



Carlson Court Neighborhood



D Street Neighborhood, near Fairview

**Figure 4-6**  
Surrounding Neighborhood Character





Atwal Court Neighborhood, at Maud



Vista Court Neighborhood at Fairview

**Figure 4-7**  
**Surrounding Neighborhood Character**



## Light and Glare

**Aesth- 4: Light and Glare.** The Project would add additional sources of light adjacent to other similar residential uses. Lighting quality, intensity and design is required to be reviewed as a part of the County's Design Review process to ensure that potential light and glare impacts on neighbors is minimized. With this required detailed review, impacts related to light and glare would not be significant. **(LTS)**

Sources of light and glare in the Project vicinity include interior and exterior building lights and street lighting. Light and glare associated with vehicular traffic in the area also creates sources of glare. These sources of light and glare, and the extent of light that they would produce are typical of those in a developed urban/suburban setting. The County's development review process requires review of lighting as part of site development approvals (County of Alameda Municipal Code section 17.54.250.K).

Development of the Project site has the potential to create additional light and glare, but the specifics of the lighting plan are not yet known. With adherence to applicable review requirements, the Project would have a less than significant impact on light and glare

### Mitigation Measures

None needed. The Project applicant has indicated the intent to provide screening in the form of landscaping and/or fencing that would further reduce light and glare from Project-related vehicle headlights on existing homes and neighbors.

## Cumulative Aesthetic Impacts

**Aesth-6: Cumulative Visual Character.** The Project, in combination with other past, present and reasonably foreseeable future development is not anticipated to result in cumulatively significant aesthetic impacts. **(Less than Cumulatively Considerable)**

As described in detail in Chapter 9: Land Use, the County Planning staff has defined a most likely cumulative development potential scenario for those properties in relative proximity to the Project sites. This cumulative development scenario assumes future construction of a total of approximately 65 new residential units on those other properties near the Project sites. It is assumed that this much new development will occur over the next 18 years (between now and 2035), reflecting an average growth rate of about 1 percent per year.

This projected future cumulative development is assumed to reflect similar residential densities, house sizes and other characteristics as the Project. This cumulative development would permanently alter the existing visual character of the area due to grading activities, vegetation removal and the introduction of new residential units and associated infrastructure. However, this cumulative development is not expected to significantly degrade the existing visual character or quality of the surroundings. Rather, all new cumulative development would be subject to the County's land use entitlement and environmental review process, including consideration of the principles, policies and guidelines of the Fairview Area Specific Plan. The County's Design Review process is likely influence new development proposals pursuant to this cumulative scenario towards general conformity in overall appearance from one Project site to another. For these reasons, cumulative development is not expected to result in cumulatively adverse aesthetics effects to which the Project' contribution would be significant.



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# Air Quality and Greenhouse Gas Emissions

This EIR section describes potential local and regional air quality and greenhouse gas (GHG) emissions impacts resulting from the Project. This section has been prepared using methodologies and assumptions recommended by the Bay Area Air Quality Management District (BAAQMD) CEQA Guidelines. This section describes existing air quality and construction-period and operational impacts.

## Environmental Setting

### Climate Conditions

The Project site is located in the hills above San Francisco Bay. The area along the Bay is primarily flat, and climate is usually controlled by marine air coming across the Bay from the Pacific Ocean. During the day, especially on summer afternoons, the prevailing wind flows from the north or northwest. In winter, wind speeds are lower, and wind may flow in from the northerly or easterly directions when weather is fair, but storms often bring southerly winds. Wind speeds in the area are generally moderate, with an annual average speed of about 5 miles per hour, although summer afternoon wind speed can average 12 miles per hour or more (at Oakland International Airport). Highest wind speeds occur during afternoons in late spring and summer. Average maximum summer temperatures are in the 70s with minimums of about 55. Maximum winter temperatures averages are in the low 60s, while the minimum temperatures are in the low 40s. Average rainfall at Oakland is 18 inches, with most of that falling in winter months.

### Existing Air Quality Conditions

#### Criteria Pollutants

Ambient air quality standards have been established by federal and state environmental agencies for specific air pollutants that are most pervasive in urban environments. These pollutants are referred to as criteria air pollutants because the standards established for them were developed to meet specific health and welfare criteria set forth in the enabling legislation.

#### *Ozone*

Ground-level ozone is the principal component of smog. Ozone is not directly emitted into the atmosphere, but is formed by the photochemical reaction of ozone precursors. These compounds are generally of two classes: reactive organic gases (ROG) and nitrogen oxides (NO<sub>x</sub>). Ozone levels are highest during late spring through late summer when precursor emissions are high and meteorological conditions are favorable for the necessary complex photochemical reactions to occur. Motor vehicles are the predominant source of reactive ozone precursor emissions in the San Francisco Bay region. High ozone levels have triggered the declaration of summertime "Spare the Air" alerts by the BAAQMD, to encourage the public to reduce unnecessary driving, increase transit and non-polluting means of travel, or other measures, when health hazards may rise.

### *Carbon Monoxide (CO)*

CO is a nonreactive pollutant that is highly toxic, invisible and odorless. It is formed by the incomplete combustion of fuels. The largest source of CO emissions is motor vehicles. Wood stoves and fireplaces also contribute to high levels of CO. Unlike ozone, CO is directly emitted to the atmosphere. The highest CO concentrations occur during the nighttime and early mornings in late fall and winter. Ambient CO levels are strongly influenced by meteorological factors such as wind speed and atmospheric stability. Wintertime Spare the Air alerts may be issued by the BAAQMD to require the public to cease all wood-burning in efforts to reduce the health risks of CO (and authorizes fines to be imposed for violators).

### *Nitrogen Dioxide (NO<sub>2</sub>)*

NO<sub>2</sub> is a reddish-brown gas that is a by-product of combustion processes. Automobiles and industrial operations are the primary sources of NO<sub>2</sub>. In addition to being a regulated criteria pollutant alone, NO<sub>2</sub> contributes to ozone smog formation.

### *Sulfur Dioxide (SO<sub>2</sub>)*

SO<sub>2</sub> is a colorless gas with a strong odor and potential to damage materials. SO<sub>2</sub> is produced by the combustion of sulfur-containing fuels such as oil and coal. Refineries, chemical plants and diesel exhaust are the primary sources of SO<sub>2</sub> emissions in the region. The proposed Project would not be a substantial source of SO<sub>2</sub> so this pollutant is not mentioned again in this chapter.

### *Inhalable Particulates*

Inhalable particulate is composed of two classes of compounds: PM<sub>10</sub> and PM<sub>2.5</sub>. PM<sub>10</sub> refers to particulate matter 10 microns or less in diameter; likewise, PM<sub>2.5</sub> refers to particulate matter 2.5 microns or less in diameter. Sources of inhalable particulates include smoke, dust, aerosols and metallic oxides. Some inhalable particulates are considered toxic. Although particulates are found naturally in the air (such as sea salt), most particulate matter found in the region are emitted either directly or indirectly by motor vehicles, industry, construction, agricultural activities and wind erosion of disturbed areas.

### *Lead*

Lead occurs in the atmosphere as particulate matter. It is primarily emitted by gasoline-powered motor vehicles burning fuel containing tetra ethyl lead, which has been virtually eliminated. As a result of lead being eliminated from fuels, levels in the Bay Area have dropped dramatically. Lead concentrations in the Bay Area are well below the ambient standards and are not forecasted to increase. The proposed Project would not be a substantial source of lead so this pollutant is not mentioned again in this chapter.

### Air Quality Standards

**Table 5.1** shows a summary of federal and state ambient air standards. The table also describes major emission sources for each compound and its potential negative effects.

**Table 5.1: Ambient Air Quality Standards for Criteria Pollutants**  
Parts per Million (ppm) or Micrograms per Cubic Meter ( $\mu\text{g}/\text{m}^3$ )

Pollutant	Averaging Time	California Standard	Federal Primary Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 hour	0.09 ppm	–	Irritation and possibly permanent lung damage.	Motor vehicles, including refining and gasoline delivery.
	8 hours	0.07 ppm	0.075 ppm		
CO	1 hour	20 ppm	35 ppm	Deprives body of oxygen in the blood. Causes headaches and worsens respiratory problems.	Primarily gasoline-powered internal combustion engines.
	8 hours	9.0 ppm	9.0 ppm		
NO <sub>2</sub>	Annual Average	0.03 ppm	0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum-refining, power plants, aircraft, ships, and railroads.
	1 hour	0.18 ppm	0.10 ppm		
SO <sub>2</sub>	Annual Average	---	0.03 ppm	Irritates and may permanently injure respiratory tract and lungs. Can damage plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	1 hour	0.25 ppm	0.075 ppm		
	24 hours	0.04 ppm	0.14 ppm		
PM <sub>10</sub>	Annual Mean	20 $\mu\text{g}/\text{m}^3$	–	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	24 hours	50 $\mu\text{g}/\text{m}^3$	150 $\mu\text{g}/\text{m}^3$		
PM <sub>2.5</sub>	Annual Mean	12 $\mu\text{g}/\text{m}^3$	12 $\mu\text{g}/\text{m}^3$	Same as PM <sub>10</sub> .	Same as PM <sub>10</sub> .
	24 hours	–	35 $\mu\text{g}/\text{m}^3$		
Lead	Monthly	1.5 $\mu\text{g}/\text{m}^3$	–	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurologic dysfunction (in severe cases).	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Quarterly	–	1.5 $\mu\text{g}/\text{m}^3$		

Source: BAAQMD, Air Quality Standards and Attainment Status, available at <http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status>

Notes: ppm = parts per million,  $\mu\text{g}/\text{m}^3$  = micrograms per cubic meter. **Bold** entries indicate nonattainment status. *Italicized* entries indicate unclassified attainment status. Normal text indicates attainment status.

Air quality in the region is controlled by the rate of pollutant emissions and meteorological conditions. Meteorological conditions such as wind speed, atmospheric stability, and mixing height may all affect the atmosphere's ability to mix and disperse pollutants. Long-term variations in air quality typically result from changes in air pollutant emissions, while frequent, short-term variations result from changes in atmospheric conditions. BAAQMD monitors air quality conditions at more than 30 locations throughout the Bay Area. The closest full monitoring station to the Project is located in Oakland. A closer station, in Hayward, monitors ozone only. **Table 5.2** summarizes exceedances of the state and federal standards at the Oakland and Hayward monitoring sites and Bay Area-wide.

**Table 5.2: Summary of Criteria Air Pollution Monitoring Data**

Pollutant	Standard	Monitoring Site	Days Standard Exceeded		
			2013	2014	2015
Ozone	State 1-Hour	Oakland	0	0	0
		Hayward	0	1	2
		SF Bay Area Air	3	3	7
Ozone	Federal 8-Hour	Oakland	0	0	2
		Hayward	0	0	2
		SF Bay Area Air	3	5	12
Ozone	State 8-Hour	Oakland	0	0	2
		Hayward	1	4	2
		SF Bay Area Air	3	10	12
PM <sub>10</sub>	Federal 24-Hour	Oakland	–	–	–
		SF Bay Area Air	0	0	0
PM <sub>10</sub>	State 24-Hour	Oakland	–	–	–
		SF Bay Area Air	6	2	2
PM <sub>2.5</sub>	Federal 24-Hour	Oakland	2	1	1
		SF Bay Area Air	13	3	3
Carbon Monoxide	State/Federal 8-Hour	Oakland	0	0	0
		SF Bay Area Air	0	0	0
NO <sub>2</sub>	State 1-Hour	Oakland	0	0	0
		SF Bay Area Air	0	0	0

Notes:

PM<sub>10</sub> monitoring was discontinued at Oakland in 2008.

PM<sub>10</sub> and PM<sub>2.5</sub> are measured every sixth day in Bay Area sites, so the number of days exceeding the standard is estimated.

The Hayward station monitors only ozone.

Source: BAAQMD Air Pollution Summaries (<http://www.baaqmd.gov/Divisions/Communications-and-Outreach/Air-Quality-in-the-Bay-Area/Air-Quality-Summaries.aspx>)

**Table 5.2** shows that air quality violations occur in the San Francisco Bay Area as a result of exceedances of ozone and PM<sub>2.5</sub> and PM<sub>10</sub> standards. In recent years, the State and federal ozone standards have been exceeded at least somewhere in the Bay Area on 3 to 12 days per year. The Bay Area has also exceeded the PM<sub>2.5</sub> standard on 3 to 13 sampling days per year. Standards for CO and NO<sub>2</sub>, or any other criteria air pollutant not listed here, were not exceeded at any San Francisco Bay Area monitoring station during this time period.

Monitoring station measurements indicate that air quality in the vicinity of the Project generally performs well against State standards for criteria air pollutants with few exceedances of pollutant standards between 2013 and 2015, the most recent year available.

### Toxic Air Contaminants

Besides the criteria air pollutants, there is another group of substances found in ambient air referred to as Hazardous Air Pollutants under the federal Clean Air Act, and Toxic Air Contaminants (TACs) under the California Clean Air Act. These contaminants tend to be localized and are found in relatively low concentrations in ambient air. However, they can result in adverse chronic health effects if exposure to low concentrations occurs for long periods. They are regulated at the local, state, and federal level.

TACs are a broad class of compounds known to cause morbidity or mortality (cancer risk), and include, but are not limited to, the criteria air pollutants listed above. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., benzene near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the federal, state, and regional levels.

Diesel exhaust is the predominant TAC in urban air, and is estimated to represent about two-thirds of the cancer risk from TACs (based on the statewide average). According to the California Air Resources Board (CARB), diesel exhaust is a complex mixture of gases, vapors and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by CARB, and are listed as carcinogens either under State Proposition 65 or under the Federal Hazardous Air Pollutants programs.

CARB reports that recent air pollution studies have shown an association that diesel exhaust and other cancer-causing toxic air contaminants emitted from vehicles are responsible for much of the overall cancer risk from TACs in California. Particulate matter emitted from diesel-fueled engines (diesel particulate matter [DPM]) was found to comprise much of that risk. In August, 1998, CARB formally identified DPM as a TAC. DPM is of particular concern, since it can be distributed over large regions, thus leading to widespread public exposure. The particles emitted by diesel engines are coated with chemicals, many of which have been identified by U.S. Environmental Protection Agency (EPA) as hazardous air pollutants and by CARB as TACs. Diesel engines emit particulate matter at a rate about 20 times greater than comparable gasoline engines. The vast majority of diesel exhaust particles (over 90 percent) consist of PM<sub>2.5</sub>, which are the particles that can be inhaled deep into the lung. Like other particles of this size, a portion will eventually become trapped within the lung, possibly leading to adverse health effects. While the gaseous portion of diesel exhaust also contains TACs, CARB's 1998 action was specific to DPM, which accounts for much of the cancer-causing potential from diesel exhaust. California has adopted a comprehensive diesel risk reduction program to reduce DPM emissions 85 percent by 2020. The U.S. EPA and CARB adopted low sulfur diesel fuel standards in 2006 that reduce diesel particulate matter substantially.

In cooler weather, smoke from residential wood combustion can be a source of TACs. Localized high TAC concentrations can result when cold stagnant air traps smoke near the ground and, with no wind, the pollution can persist for many hours, especially in sheltered valleys during winter. Wood smoke also contains a significant amount of PM<sub>10</sub> and PM<sub>2.5</sub>. Wood smoke is an irritant, and is implicated in worsening asthma and other chronic lung problems. BAAQMD Regulation 6, Rule 3, disallows wood-burning devices in new construction, except those meeting U.S. EPA emissions targets and approved by the Air Pollution Control Officer of the BAAQMD. Compliance with this rule can be assumed.

### Sensitive Receptors

Some groups of people are more affected by air pollution than others. Children, the elderly, and people with respiratory disease or chronic health problems are typically more sensitive to air pollution. The land uses associated with possibly sensitive receptors include schools, hospitals, playgrounds, retirement homes, child-care centers, convalescent homes, medical clinics, and residences.

### Odors

Objectionable odors may be associated with a variety of pollutants. Common sources of odors include wastewater treatment plants, landfills, composting facilities, refineries and chemical plants. Odors rarely have direct health impacts, but they can be very unpleasant and can lead to concern over possible health effects among the public. Each year the BAAQMD receives thousands of citizen complaints about objectionable odors.

## **Greenhouse Gases**

Gases that trap heat in the Earth's atmosphere are called GHGs. These gases play a critical role in determining the Earth's surface temperature. Part of the solar radiation that would have been reflected back into space is absorbed by these gases, resulting in a warming of the atmosphere. Without natural GHGs, the Earth's surface would be about 61 degrees cooler.<sup>1</sup> This phenomenon is known as the greenhouse effect. However, scientists have proven that emissions from human activities such as electricity generation, vehicle emissions, and even farming and forestry practices, have elevated the concentration of GHGs in the atmosphere beyond naturally-occurring concentrations, enhancing the greenhouse effect and contributing to the larger process of global climate change. The six primary GHGs are:

- Carbon Dioxide (CO<sub>2</sub>), emitted when solid waste, fossil fuels (oil, natural gas, and coal), and wood and wood products are burned;
- Methane (CH<sub>4</sub>), produced through the anaerobic decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, incomplete fossil fuel combustion, and water and wastewater treatment;
- Nitrous oxide (N<sub>2</sub>O), typically generated as a result of soil cultivation practices, particularly the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning;
- Hydrofluorocarbons, primarily used as refrigerants;
- Perfluorocarbons, originally introduced as alternatives to ozone depleting substances and typically emitted as by-products of industrial and manufacturing processes; and
- Sulfur hexafluoride (SF<sub>6</sub>), primarily used in electrical transmission and distribution.

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<sup>1</sup> California Climate Action Team, 2006.

Though there are other contributors to global warming, these six GHGs are identified explicitly by the EPA as threatening the public health and welfare of current and future generations.

### *Global Warming Potential*

The Global Warming Potential (GWP) concept is used to compare the ability of each GHG to trap heat in the atmosphere relative to CO<sub>2</sub>, which is the most abundant GHG. CO<sub>2</sub> has a GWP of 1, expressed as CO<sub>2</sub> equivalent (CO<sub>2</sub>e). Other GHGs, such as CH<sub>4</sub> and N<sub>2</sub>O, are commonly found in the atmosphere at much lower concentrations, but with higher warming potentials, having CO<sub>2</sub>e ratings of 21 and 310, respectively. Trace gases such as chlorofluorocarbons and hydro-chlorofluorocarbons have much greater warming potential. Fortunately, these gases are found at much lower concentrations and many are being phased out as a result of global efforts to reduce destruction of stratospheric ozone. In the U.S. in 2010, CO<sub>2</sub> emissions account for about 84 percent of the GHG emissions, followed by CH<sub>4</sub> at about 9 percent and N<sub>2</sub>O at just under 5 percent.<sup>2</sup>

### *Greenhouse Gas Emissions Inventories*

Worldwide emissions of GHGs in 2004 were 49 billion tons of CO<sub>2</sub>e per year. Global GHG emissions due to human activities have grown since pre-industrial times, with an increase of 70% between 1970 and 2004.<sup>3</sup>

In 2008, the U.S. emitted about 7 billion tons of CO<sub>2</sub>e, a 14 percent increase from 1990. Emissions per capita have remained nearly level since 1990, as emissions have increased at about the same rate as the population.<sup>4</sup>

In 2009, California's net emissions were approximately 453 million metric tons of CO<sub>2</sub>e, or about 6.5 percent of the U.S. emissions. This large number is due primarily to the sheer size of California compared to other states. By contrast, California has the fifth lowest state-wide per capita GHG emission rates in the country. 2009 total net emissions represent a 1.3 percent decrease from 2000 and a 6.1 increase from 1990 emissions levels.<sup>5</sup>

BAAQMD most recently updated the GHG emission inventory in 2010 using a base year of 2007.<sup>6</sup> In the Bay Area, fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) is the single largest source of the Bay Area's GHG emissions, accounting for 36.41% of the Bay Area's 95.8 million tons of GHG emissions in 2007. Industrial and commercial sources were the second largest contributors of GHG emissions with about 36.40% of total emissions. Domestic sources (e.g., home water heaters, furnaces) account for about 7% of the Bay Area's GHG emissions, and energy production accounted for 15.9% percent. Off-road equipment and agriculture make up the remainder with approximately 3% and 1.2% of the total Bay Area 2007 GHG emissions, respectively.

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<sup>2</sup> U.S. EPA, April 15, 2012, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2010, Table 2-1: Recent Trends in U.S. Greenhouse Gas Emissions and Sinks.

<sup>3</sup> Intergovernmental Panel on Climate Change, November 2007, Climate Change 2007: Synthesis Report, Figure 2.1.

<sup>4</sup> U.S. EPA, 2010, Climate Change Indicators in the United States, p. 11.

<sup>5</sup> California Energy Commission, Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2009, December 2011.

<sup>6</sup> BAAQMD, February 2010, Source Inventory of Bay Area Greenhouse Gas Emissions, available at <http://www.baaqmd.gov/Divisions/Planning-and-Research/Emission-Inventory/Greenhouse-Gases.aspx>.

## Potential Effects of Global Climate Change

### *Global Effects*

Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG at or above current rates would induce more extreme climate changes during the twenty-first century than were observed during the twentieth century. A warming of about 0.2 degree Celsius (0.36 degree Fahrenheit) per decade is projected, and there are identifiable signs that global warming is taking place, including substantial ice loss in the Arctic. The projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects, according to the International Panel on Climate Change.<sup>7</sup>

- Snow cover is projected to contract, with permafrost areas sustaining thawing.
- Sea ice is projected to shrink in both the Arctic and Antarctic.
- Hot extremes, heat waves, and heavy precipitation events are likely to increase in frequency.
- Future tropical cyclones (typhoons and hurricanes) will likely become more intense.
- Non-tropical storm tracks are projected to move poleward, with consequent changes in wind, precipitation, and temperature patterns. Increases in the amount of precipitation are very likely in high-latitudes, while decreases are likely in most subtropical regions.
- Warming is expected to be greatest over land and at most high northern latitudes, and least over the Southern Ocean and parts of the North Atlantic Ocean.

Potential secondary effects from global warming include global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity.

### *Effects on the State of California*

According to CARB, some of the potential impacts in California of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years.<sup>8</sup> Several recent studies have attempted to explore the possible negative consequences that climate change, left unchecked, could have in California. These reports acknowledge that climate scientists' understanding of the complex global climate system, and the interplay of the various internal and external factors that affect climate change, remains too limited to yield scientifically valid conclusions on such a localized scale. Substantial work has been done at the international and national level to evaluate climatic impacts, but far less information is available on regional and local impacts. In addition, projecting regional impacts of climate change and variability relies on large-scale scenarios of changing climate parameters, using information that is typically at too general a scale to make accurate regional assessments.<sup>9</sup>

Below is a summary of some of the potential effects reported in an array of studies that could be experienced in California as a result of global warming and climate change:

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<sup>7</sup> International Panel on Climate Change Special Report on Emissions Scenarios, 2000, [www.grida.no/climate/ipcc/emission/002.htm](http://www.grida.no/climate/ipcc/emission/002.htm), accessed July 24, 2007

<sup>8</sup> California Air Resources Board, December 2006, Public Workshop to Discuss Establishing the 1990 Emissions Level and the California 2020 Limit and Developing Regulations to Require Reporting of Greenhouse Gas Emissions.

<sup>9</sup> Kiparsky, M. and P.H. Gleick, July 2003, Climate Change and California Water Resources: A Survey and Summary of the Literature.



- **Air Quality** – Higher temperatures, conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. For other pollutants, the effects of climate change and/or weather are less well studied, and even less well understood.<sup>10</sup> If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in turn, would further worsen air quality. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thus ameliorating the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat related deaths, illnesses, and asthma attacks throughout the State.<sup>11</sup>
- **Water Supply** – Uncertainty remains with respect to the overall impact of global climate change on future water supplies in California. For example, models that predict drier conditions suggest decreased reservoir inflows and storage and decreased river flows, relative to current conditions. By comparison, models that predict wetter conditions project increased reservoir inflows and storage, and increased river flows.<sup>12</sup>
- **Hydrology** – As discussed above, climate change could potentially affect the amount of snowfall, rainfall and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. Sea level rise can be a product of global warming through two main processes: expansion of seawater as the oceans warm, and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could also jeopardize California’s water supply. In particular, saltwater intrusion would threaten the quality and reliability of the state’s major fresh water supply that is pumped from the southern portion of the Sacramento/San Joaquin River Delta. Increased storm intensity and frequency could affect the ability of flood-control facilities (including levees) to handle storm events.
- **Agriculture** – California has a \$30 billion agricultural industry that produces half the country’s fruits and vegetables. The California Climate Change Center notes that higher CO<sub>2</sub> levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase; crop-yield could be threatened by a less reliable water supply; and greater ozone pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the time of year that certain crops, such as wine grapes, bloom or ripen, and thus affect their quality.<sup>13</sup>
- **Ecosystems and Wildlife** – Increases in global temperatures and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. In 2004, the Pew Center on Global Climate Change released a report examining the possible impacts of climate

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<sup>10</sup> U.S. EPA, 2010, Climate Change Indicators in the United States.

<sup>11</sup> California Climate Change Center, July 2006, *Our Changing Climate: Assessing the Risks to California*, CEC- 500-2006-077.

<sup>12</sup> Brekke, L.D., et al, 2004, “Climate Change Impacts Uncertainty for Water Resources in the San Joaquin River Basin, California.” *Journal of the American Water Resources Association*. 40(2): 149–164.

<sup>13</sup> California Climate Change Center, July 2006, *Our Changing Climate: Assessing the Risks to California*, CEC- 500-2006-077.

change on ecosystems and wildlife.<sup>14</sup> The report outlines four major ways in which it is thought that climate change could affect plants and animals: (1) timing of ecological events; (2) geographic range; (3) species' composition within communities; and (4) ecosystem processes such as carbon cycling and storage.

## Regulatory Environment

### Federal

#### Federal Clean Air Act

The federal Clean Air Act, enacted largely in its current form in 1970 and amended in 1977 and 1990, establishes the framework for federal air pollution control. The act directed the U.S. EPA to establish the National Ambient Air Quality Standards (NAAQS). An area that does not meet the federal standard for a pollutant is called a "nonattainment" area for that pollutant. For federal nonattainment areas, the Clean Air Act requires states to develop and adopt State Implementation Plans (SIPs), which are air quality plans showing how air quality standards will be attained. The Clean Air Act Amendments of 1990 added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution.

The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. The U.S. EPA has responsibility to review all State SIPs to determine conformation to the mandates of the Federal Clean Air Act Amendments of 1990 (FCAAA), and to determine if implementation will achieve air quality goals. If the U.S. EPA determines a SIP to be inadequate, a Federal Implementation Plan may be prepared for the nonattainment area that imposes additional control measures. Failure to submit an approvable SIP or to implement the plan within the mandated timeframe may result in sanctions being denied to transportation funding and stationary air pollution sources in the air basin. In California, SIPs are prepared and adopted by the local or regional air districts (in the Bay Area, by the BAAQMD) and are reviewed and submitted to the U.S. EPA by CARB.

#### *Attainment of Federal Standards and Conformity Analysis*

As noted above, if an area such as BAAQMD does not meet one of the NAAQS, the EPA designates it as nonattainment for that particular pollutant (see **Table 5.1**). Incremental progress is required toward meeting the NAAQS, and areas with the most acute problems must adopt the most stringent rules on new and existing emission sources. If an area does not make forward progress or fails to submit an adequate plan, sanctions may be imposed, such as withholding federal highway funds.

Section 176(c) of the 1990 Clean Air Act amendments outlines the requirements for federally funded projects to conform to efforts to meet and sustain the NAAQS. Section 176(c) also assigns responsibility for conformity assurance to the federal agency undertaking (or funding) the Project. Responsibility cannot be transferred by the responsible agency to EPA, state, or local agencies (e.g., BAAQMD). Conformity requires federally funded or supported activities not, (1) cause or contribute to any new air quality standard violation, (2) increase the frequency or severity of any existing standard violation, or (3) delay the timely attainment of any standard, interim emission reduction, or other SIP milestone aimed at bringing the region into attainment.

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<sup>14</sup> Parmesan, C. and H. Galbraith, November 2004, Observed Impacts of Global Climate Change in the U.S.

In 1993, the EPA issued the General Conformity regulations. The General Conformity regulations apply to all projects that would cause emissions of criteria pollutants above specified levels in areas designated non-attainment or maintenance. In the Bay Area, this rule applies to ozone precursors (ROG and NO<sub>x</sub>) and CO in excess of 100 tons per year, or if the emissions are more than 10 percent of the inventory for the pollutant of concern. Projects that are subject to General Conformity must mitigate or fully offset the emissions cause by the action. This includes both direct (fossil fuel burning) and indirect (traffic) emissions. BAAQMD adopted and incorporated the General Conformity regulations into the SIP in 1994.

## **State**

### Air Quality

#### *California Clean Air Act*

The California Clean Air Act of 1988 focuses on attainment of the California Ambient Air Quality Standards (CAAQS), which, for certain pollutants and averaging periods, is more stringent than the comparable federal standards. Responsibility for achieving California standards is placed on the CARB and local air pollution control districts through district-level air quality management plans. The California Clean Air Act requires designation of attainment and nonattainment areas with respect to CAAQS. The California Clean Air Act also requires that local and regional air districts expeditiously adopt and prepare an air quality attainment plan if the district violates State air quality standards for CO, SO<sub>2</sub>, NO<sub>2</sub>, or ozone. No locally prepared attainment plans are in place for areas that violate the State PM<sub>10</sub> standards, because attainment plans are not required for those areas. The California Clean Air Act requires that the State air quality standards be met as expeditiously as practicable, but unlike the federal Clean Air Act, does not set precise attainment deadlines. Instead, the act established increasingly stringent requirements for areas that will require more time to achieve the standards.

CARB is primarily responsible for developing and implementing air pollution control plans to achieve and maintain the NAAQS. The CARB is primarily responsible for statewide pollution sources and produces a major part of the SIP. Local air districts are still relied upon to provide additional strategies for sources under their jurisdiction. The CARB combines this data and submits the completed SIP to U.S. EPA. Other CARB duties include monitoring air quality, in conjunction with air monitoring networks maintained by air pollution control and air quality management districts; establishing CAAQS, which in many cases are more stringent than the NAAQS; determining and updating area designations and maps; and setting emissions standards for new mobile sources, consumer products, small utility engines, and off-road vehicles.

#### *State TAC Regulations*

TACs in California are primarily regulated through the Tanner Air Toxics Act (Assembly Bill [AB] 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588, or the Hot Spots Act). AB 1807 sets forth a formal procedure for CARB to designate substances as TACs. Research, public participation, and scientific peer review are necessary before ARB can designate a substance as a TAC. To date, CARB has adopted U.S. EPA's list of hazardous air pollutants as TACs and identified more than 21 additional TACs. Most recently, environmental tobacco smoke was added to CARB's list of TACs in 2007.

## GHG Emissions

Global climate change is addressed through the efforts of various state agencies as well as national and international scientific and governmental conventions and programs. The following provides a short summary of relevant state, regional, and local measures to address GHG emissions.

### *Climate Action Plan*

Assembly Bill (AB) 1493, enacted in 2002, directs CARB to develop and implement regulations that achieve the “maximum feasible reduction” of GHG emissions from passenger vehicles, light-duty trucks, and other noncommercial vehicles.

### *Executive Order S-3-05*

On June 1, 2005, Governor Schwarzenegger signed Executive Order S-3-05 which established the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 emission levels; by 2020, reduce GHG emissions to 1990 emission levels; and by 2050, to reduce GHG emissions to 80 percent below 1990 levels.

### *California Global Warming Solutions Act of 2006*

AB 32, the California Global Warming Solutions Act (Health and Safety Code Section 38500 et seq.), was signed into law in September 2006. The Act requires the reduction of statewide GHG emissions to 1990 levels by the year 2020. This change, which is estimated to be a 25 to 35 percent reduction from current emission levels, will be accomplished through an enforceable statewide cap on GHG emissions that began to be phased in starting in 2012. The Act also directs the CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources and address GHG emissions from vehicles. The CARB has stated that the regulatory requirements for stationary sources will be first applied to electricity power generation and utilities, petrochemical refining, cement manufacturing, and industrial/commercial combustion. The second group of target industries will include oil and gas production/ distribution, transportation, landfills and other GHG-intensive industrial processes.

### *Scoping Plan*

On December 11, 2008, CARB adopted its Climate Change Scoping Plan, which functions as a roadmap of CARB’s plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations. The Scoping Plan contains the main strategies California will implement to reduce CO<sub>2</sub>e emissions by 174 million metric tons, or approximately 30 percent, from the State’s projected 2020 emissions level of 596 million metric tons CO<sub>2</sub>e under a business as usual scenario. The Scoping Plan also breaks down the amount of GHG emissions reductions the ARB recommends for each emissions sector of the State’s GHG inventory. The Scoping Plan’s recommended measures were developed to reduce GHG emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving natural resources, and ensuring that the impacts of the reductions are equitable and do not disproportionately impact low-income and minority communities. These measures also put the State on a path to meet the long-term goal of reducing California’s GHG emissions by 2050 to 80 percent below 1990 levels.

### *Senate Bill (SB) 375*

The transportation sector contributes approximately 40 percent of the GHG emissions in California. While substantial reductions to GHG emissions from automobiles and light trucks can be achieved through new vehicle technology and by the increased use of low carbon fuel, the legislature determined that these reductions will not be enough to achieve the GHG emission reduction goals pursuant to AB 32 and that it will therefore be necessary to achieve additional significant GHG reductions from changed

land use patterns and improved transportation. SB 375 melds regional transportation and local land use planning in an effort to achieve GHG emission reductions from automobiles and light trucks by using transportation and land use planning to implement “smart growth” principles, thereby reducing vehicle trips and the resulting GHG emissions.

#### *California’s Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24)*

Known by the shorthand name of Title 24, this policy was established in 1978 in response to a legislative mandate to reduce California’s energy consumption. Title 24 is updated periodically to allow for incorporation of new energy efficiency technologies and methods. The most recent update, in 2008, incorporated AB 32 mandates and advanced the energy efficiency requirements in order to meet California’s energy needs. The 2013 update to the standards were built upon the previous standards and took effect in January 2014. Several State energy policy goals drive the design of the prior standards: the “Loading Order,” which directs California’s growing demand must first be met with cost-effective energy efficiency; Zero Net Energy goals for new homes by 2020 and commercial buildings by 2030; Governor Brown’s Executive Order on Green Buildings; the Green Building Standards Code, and AB 32. The 2013 Standards will use 25 percent less energy for lighting, heating, cooling, ventilation, and water heating than the 2008 Standards. Additionally, the 2013 Standards will result in a reduction of 170,500 tons of GHG emissions per year. The most recent 2013 update (which took effect in January 2014) directs that California’s growing building demand must be met with cost-effective energy efficiency, with “zero net energy” goals for new homes by 2020 and commercial buildings by 2030, resulting in a substantial reduction of GHG emissions per year.

#### *California Green Building Standards Code (CALGreen)*

California’s green building code, referred to as CALGreen, was developed to provide a consistent approach to green building within the State. Taking effect in January 2011, CALGreen lays out the minimum requirements for newly constructed residential and nonresidential buildings to reduce GHG emissions through improved efficiency and process improvements. It also includes voluntary tiers to further encourage building practices that improve public health, safety and general welfare by promoting the use of building concepts which minimize the building’s impact on the environment and promote a more sustainable design. Local jurisdictions are required to adopt the CALGreen provisions. CALGreen is complimentary with California Energy Code, Title 24, Part 6, which continues to regulate energy efficiency in buildings. CALGreen references Title 24, Part 6 where relevant and several voluntary measures in the CALGreen building code require energy efficient that exceeds Title 24, Part 6 requirements by 15 or 30 percent. CALGreen requires that every new building constructed in California implement the following:

- Reduce water consumption by 20 percent
- Divert 50 percent of construction waste from landfills
- Install low pollutant-emitting materials
- Require separate water meters for nonresidential buildings’ indoor and outdoor water use
- Require moisture-sensing irrigation systems for larger landscape projects
- Require mandatory inspections of energy systems (e.g., heat furnace, air conditioner and mechanical equipment) for nonresidential buildings over 10,000 square feet to ensure that all are working at their maximum capacity and according to their design efficiencies.

### *Sustainable Communities Strategies and Plan Bay Area*

SB 375 created a new regional planning mechanism, the Sustainable Communities Strategy, which promotes high density, transit-oriented development, and creates incentives for specifically defined, high-density development projects. The Sustainable Communities Strategy must set forth a forecasted development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, will reduce GHG emissions from automobile and light trucks to achieve the GHG emission reduction targets approved by CARB. On July 18, 2013, the Association of Bay Area Governments and the Metropolitan Transportation Commission adopted Plan Bay Area, an integrated transportation and land use-use strategy through 2040 that marks the nine-county Bay Area region's first long-range plan to meet the requirements of SB 375.

### *Senate Bill 97—Modification to the Public Resources Code*

Pursuant to Senate Bill 97, the California Natural Resources Agency reviewed and adopted the amendments to the CEQA Guidelines on December 30, 2010 prepared and forwarded by the Governor's Office of Planning and Research. The Amendments became effective on March 18, 2010, including the addition of the GHG emissions environmental topic and checklist items.

### Regional - Bay Area Air Quality Management District

The BAAQMD regulates air quality in the nine-county San Francisco Bay Area Air Basin, including the Alameda County area and site of the proposed Project. The District primarily regulates stationary sources and develops plans to achieve and maintain air quality standards. The CARB and EPA have jurisdiction over mobile sources. To protect public health, BAAQMD has adopted plans to achieve ambient air quality standards. BAAQMD must continuously monitor its progress for plan implementation. BAAQMD must report this effort regularly to the CARB and the EPA. It must also periodically revise its attainment plans to reflect new conditions and requirements.

In general, the Bay Area has a moderately high potential for air pollution due to its large population, its refineries and other industry, and to a lesser extent, geography and climate. It is a nonattainment area (ambient levels exceed the respective state or federal air quality standard) for ground-level ozone, PM<sub>10</sub>, and PM<sub>2.5</sub>.) Winds often move ozone precursors generated in Alameda County to other parts of the region, where smog is formed several hours later (hence the highest pollution levels in the area occur in the warmer inland valleys). BAAQMD tries to exercise a uniform emission control effort that will bring the entire region into compliance with state and federal standards as quickly as possible.

BAAQMD prepared its first ozone attainment plan to meet California standards in 1991. Approximately triennial assessments and revisions to the Clean Air Plan have subsequently been prepared, with the most recent in 2010. The Bay Area 2010 CAP provides a control strategy to reduce ozone, PM, TACs, and GHGs in a single, integrated plan.

### *BAAQMD CEQA Guidelines and Thresholds of Significance*

In December 1999, the BAAQMD adopted its CEQA Guidelines – “Assessing the Air Quality Impacts of Projects and Plans”, as a guidance document to provide lead government agencies, consultants and project proponents with uniform procedures for assessing air quality impacts and preparing the air quality sections of environmental documents for projects subject to CEQA. The 1999 BAAQMD CEQA Guidelines was an advisory document, and local jurisdictions were not required to utilize the methodology outlined therein.

The BAAQMD most recently updated its CEQA Air Quality Guidelines in May 2012. These guidelines continue to provide direction on recommended analysis methodologies, but no longer recommend

quantitative significance thresholds. The Air District recommends that lead agencies develop their own thresholds of significance. Alameda County references the BAAQMD CEQA Thresholds Options and Justification Report (2009), which provides substantial evidence for reliance on the thresholds published in 2011. As such, the air quality thresholds used in this EIR are based upon the substantial evidence provided in the BAAQMD CEQA Thresholds Options and Justification Report as accounted for in the BAAQMD's 2011 Guidelines.

### Local

#### *Alameda County Unincorporated Community Climate Action Plan*

The Alameda County Climate Action Plan addresses reduction of GHG emissions through a series of 37 local programs and policy measures related to transportation, land use, building, energy, water, waste, and green infrastructure. The Plan is intended enable the County to reduce its community-wide emissions by more than 15% by the year 2020. The Plan was approved by the Board of Supervisors on February 4, 2014.

#### *Alameda County Green Building Ordinance—Unincorporated Communities*

Alameda County adopted a Green Building Ordinance for residential and commercial properties in unincorporated communities in 2009. The goal of the ordinance is to promote practices that will reduce water and resource usage, reduce waste, and increase energy efficiency in the construction or remodeling of residential and nonresidential structures. Pursuant to the ordinance, building permit applications for all new residential construction or rebuilt residential construction greater than 1,000 square feet, and all new or rebuilt non-residential construction greater than 3,000 square feet located in the unincorporated areas of Alameda County, must submit documentation demonstrating how specific green building standards (GreenPoint Rated, LEED, or certification from a qualified third party) are met.

## **Impacts and Mitigation Measures**

The following section describes potentially significant Project impacts to air quality and greenhouse gas emissions. Mitigation measures are recommended as necessary to avoid, minimize, or mitigate such impacts, where feasible.

### Significance Criteria

1. Conflict with or obstruct implementation of the applicable air quality plan;
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
3. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
4. Expose sensitive receptors to substantial pollutant concentrations;
5. Create objectionable odors affecting a substantial number of people;
6. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
7. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

As discussed in the Regulatory Setting above, the thresholds used in this EIR for air quality are generally based upon the substantial evidence provided in the BAAQMD CEQA Thresholds Options and Justification Report, as accounted for in the BAAQMD's 2011 Guidelines. These thresholds provide that the Project would cause significant adverse air quality impacts that; a) may violate an air quality standard, b) result in cumulatively considerable concentrations of criteria pollutants, or c) expose sensitive receptors to substantial pollutant concentrations, if it would exceed the following standards:

- During project construction, result in average daily emissions of 54 pounds per day of ROG, NOx, or PM<sub>2.5</sub>; or 82 pounds per day of PM<sub>10</sub>;
- During project operation, result in average daily emissions of 54 pounds per day of ROG, NOx, or PM<sub>2.5</sub>; or 82 pounds per day of PM<sub>10</sub>; or result in maximum annual emissions of 10 tons per year of ROG, NOx, or PM<sub>2.5</sub> or 15 tons per year of PM<sub>10</sub>;
- Contribute to carbon monoxide (CO) concentrations exceeding the California Ambient Air Quality Standards (CAAQS) of 9 parts per million (ppm) averaged over eight hours, and 20 ppm for one hour;<sup>15</sup>
- For new sources of Toxic Air Contaminants (TACs) during either project construction or project operation, expose sensitive receptors to substantial levels of TACs resulting in an increase in cancer risk level greater than 10 in one million, an increase in non-cancer risk (chronic or acute) hazard index greater than 1.0, or an increase of annual average PM<sub>2.5</sub> of greater than 0.3 micrograms per cubic meter; or, under cumulative conditions, resulting in a cancer risk level greater than 100 in a million, a non-cancer risk (chronic or acute) hazard index greater than 10.0, or annual average PM<sub>2.5</sub> of greater than 0.8 micrograms per cubic meter;<sup>16</sup>
- Expose new sensitive receptors to substantial ambient levels of Toxic Air Contaminants (TACs) resulting in a cancer risk level greater than 100 in a million, a non-cancer risk (chronic or acute) hazard index greater than 10.0, or annual average PM<sub>2.5</sub> of greater than 0.8 micrograms per cubic meter. Discussion and use of these thresholds (where provided in this EIR) is for informational purposes, only.

### Conflict with Air Quality Plans

**AQ-1: Consistency with the Clean Air Plan.** As a project consistent with local land use designations and zoning, the Project is consistent with assumptions regarding future growth and overall vehicle miles travelled, as included in the Bay Area Clean Air Plan. As such, the Project impacts regarding potential conflict with, or obstruction of implementation of the applicable Air Quality Plan are less than significant. **(LTS)**

The Project site is subject to the Bay Area Clean Air Plan, first adopted by the Bay Area Air Quality Management District (BAAQMD) in association with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) in 1991, and last updated in September 2010 - called the Bay Area 2010 Clean Air Plan. The Project's impact would be significant if the Project would

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<sup>15</sup> Localized CO concentrations are suggested to be estimated for those projects in which project-generated traffic would conflict with an applicable congestion management program, or where project-generated traffic would increase traffic volumes at affected intersections to more than 44,000 vehicles per hour (or 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited).

<sup>16</sup> For this threshold, sensitive receptors include residential uses, schools, parks, daycare centers, nursing homes, and medical centers.



conflict with or obstruct implementation of the regional air quality plan, in this case the 2010 Clean Air Plan (CAP).

The CAP is meant to demonstrate progress toward meeting ozone standards, but also includes other elements related to particulate matter, toxic air contaminants, and greenhouse gases. Many of the CAP's emission control measures are targeted to area-wide improvements, large stationary source reductions, or large employers, and not directly applicable to the Project. However, the Project would meet current standards of energy efficiency (CAP Energy and Climate Measure 1), and does not conflict with applicable control measures aimed at improving access/connectivity for bicycles and pedestrians (CAP Transportation Control Measures D-1 and D-2).

As a Project consistent with local land use designations and zoning, the Project would be consistent with growth assumptions and projections of vehicle miles travelled, as presented in the CAP. Therefore, the Project is not inconsistent with the CAP and would not present a significant impact in regard to this criteria

#### Mitigation Measures

None needed

### **Construction-Period Dust and Criteria Pollutant Emissions**

**AQ 2: Construction-Period Dust and Emissions.** Construction of the Project would result in temporary emissions of dust that may result in both nuisance and health impacts. Without appropriate measures to control dust emissions, impacts would be considered significant. **(LTS with Mitigation)**

#### *Dust*

Project-related construction activities (e.g., demolition, site preparation, earthmoving) would generate short-term emissions of fugitive dust. Construction-related fugitive dust emissions would vary from day to day depending on the level and type of activity, silt content of the soil, and the weather. In the absence of mitigation, construction activities may result in significant quantities of dust that may adversely affect (on a temporary and intermittent basis), local visibility and PM<sub>10</sub> and PM<sub>2.5</sub> concentrations. In addition, fugitive dust generated by construction could include larger particles that would fall out of the atmosphere within several hundred feet of the site and could result in nuisance-type impacts.

#### *Criteria Pollutants*

Construction activity will also generate short-term emissions of criteria pollutants from construction equipment. These criteria pollutants include suspended and inhalable particulate matter and equipment exhaust emissions inclusive of particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) and reactive organic gas (ROG), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO) and sulfur oxides (SO<sub>x</sub>).

As indicated in the BAAQMD's 2011 CEQA Guidelines, Table 2-4: Thresholds of Significance for Construction-Related Criteria Air Pollutants and Precursors, construction-period emissions that exceed 54 lbs./day of ROG, 54 lbs/day of NO<sub>x</sub>, 82 lbs/day of PM<sub>10</sub> in construction exhaust, and/or 54 lbs/day of PM<sub>2.5</sub> in construction exhaust, are considered significant. The BAAQMD's 2011 CEQA Guidelines also include substantial evidence substantiating operational and construction-period screening levels for criteria air pollutants. These screening levels provide a conservative indication of whether a project could result in potentially significant air quality impacts related to emission of criteria air pollutants. If a proposed project does not exceed the screening levels, then detailed air quality assessment of the Project's

criteria air pollutant emissions is not necessary, and impacts are deemed to be less than significant. The BAAQMD's screening size for construction-period criteria pollutant emissions for construction of single-family dwellings is 114 units.<sup>17</sup> The Project, at 31 single-family lots, is well below this screening level, and therefore not anticipated to result in emissions of criteria pollutants that would exceed threshold levels during construction, and criteria pollutant emissions during construction would be at a level that is less than significant.

### Mitigation Measures

#### *Dust*

The County considers implementation of effective and comprehensive dust control measures (i.e., those Best Management Practices that are based upon substantial evidence as provided in the BAAQMD CEQA Thresholds Options and Justification Report, and as included in the BAAQMD's 2011 Guidelines) as the threshold of significance for fugitive dust emissions. If a project complies with specified dust control measures, it would not result in a significant impact related to construction period dust emissions. In order to be protective of the health of nearby residences as well as to reduce dust emissions that could affect regional air quality, the Project is required to implement the following "Basic" measures. Because of the Project's immediate adjacency to potentially particularly sensitive receptors at the Hilltop Care Convalescent Home, additional "Enhanced" measures are also recommended for the Project, as included in Mitigation Measure AQ 5.1, below:

**Mitigation Measure AQ -2: Construction Management Practices.** The Project shall demonstrate compliance with the following BAAQMD-recommended "Basic" and "Enhanced" construction mitigation measures:

#### Basic Measures:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.

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<sup>17</sup> Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, May 2011, Table 3-1.

- Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Enhanced Measures:

- All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe.
- All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
- Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.
- Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
- The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.
- All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
- Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel.
- Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.
- Minimize the idling time of diesel powered construction equipment to two minutes.
- The project shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project wide fleet-average 20 percent NOX reduction and 45 percent PM reduction compared to the most recent ARB fleet average. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.
- Use low VOC (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings).
- Require that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of NOx and PM.
- Require all contractors use equipment that meets CARB's most recent certification standard for off-road heavy duty diesel engines.

### Resulting Level of Significance

Implementation of Mitigation Measure AQ-2 would reduce the Project's potential impact related to construction period dust emissions to a level that is less than significant.

The Project does not exceed applicable construction-period criteria pollutant screening criteria, and criteria pollutants emitted during the Project's construction period would be less than significant. However, measures included in Mitigation Measure AQ-2 would also serve to further reduce criteria pollutant emissions.

### **Operational Emissions of Criteria Pollutants**

**AQ-3: Operational Emissions.** The Project would result in increased emissions from on-site operations and emissions from vehicles traveling to the site, but the level of Project emissions would not be considered to be significant. **(LTS)**

Operational emissions typically represent the majority of a project's air quality impacts. Operational emissions include mobile (driving) and area sources, generally including fuel combustion from space and water heating, landscape maintenance equipment, fireplaces/stoves, evaporative emissions from architectural coatings and consumer products, and unpermitted emissions from stationary sources.

The thresholds used in this EIR indicate the Project's emissions would be considered significant if they were to exceed 54 lbs/day of ROG, 54 lbs/day of NOX, 82 lbs/day of PM10, and/or 54 lbs/day of PM2.5. The BAAQMD's 2011 CEQA Guidelines include substantial evidence substantiating operational screening levels for criteria air pollutants. These screening levels provide a conservative indication of whether a project could result in potentially significant air quality impacts related to emission of criteria air pollutants during operation. If a proposed project does not exceed the screening levels, then detailed air quality assessment of the Project's criteria air pollutant emissions is not necessary, and impacts are deemed to be less than significant. The screening size for operational criteria pollutant emissions for single-family dwellings is 325 units.<sup>18</sup> The Project, at 31 single-family lots, is well below this screening level, and therefore not anticipated to result in emissions of criteria pollutants that would exceed threshold levels, and criteria pollutant emissions during operations would be at a level that is less than significant.

### Mitigation Measures

None needed.

### **Carbon Monoxide Emissions**

**AQ-4: Carbon Monoxide Emissions.** The Project would generate increased CO emissions, primarily from Project-related vehicles, but these emissions levels would not exceed screening criteria and the impact would be less than significant. **(LTS)**

The BAAQMD CEQA Guidelines indicate that a project would result in a less than significant impact to localized CO concentrations if the project is consistent with an applicable congestion management program (CMP), if project-generated traffic would not increase traffic volumes to more than 44,000 vehicles per hour, and/or if the project's traffic would not increase traffic volumes to more than 24,000 vehicles per hour at affected intersections where vertical and/or horizontal air mixing is substantially limited (i.e., within a tunnel or confined space). The Project does not present any inconsistencies with

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<sup>18</sup> Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, May 2011, Table 3-1.

the applicable CMP, and does not generate substantial traffic that would exceed any of the applicable CO threshold criteria. The Project's CO emissions would be at a level that is less than significant.

#### Mitigation Measures

None needed.

### **TAC Emissions – Construction Period**

**AQ -5: TAC Emissions-Construction Period.** Construction activities would expose nearby sensitive receptors to toxic air contaminants during the construction period, but the maximum exposure risk would be below the thresholds of significance under BAAQMD criteria for cancer, chronic hazard, and PM<sub>2.5</sub> exposure. This would be a significant impact **(LTS with Mitigation)**.

For purposes of assessing a project's risk of exposing sensitive receptors to health risks and hazards, the threshold of significance is exceeded if the project-specific cancer risk to nearby receptors exceeds 10 in one million (or a cumulative cancer risk of 100 in one million), the non-cancer risk exceeds a Hazard Index of 1 (or a cumulative Hazard Index of 10), and/or the annual average PM<sub>2.5</sub> concentration exceeds 0.3 µg/m<sup>3</sup> (or cumulative annual average PM<sub>2.5</sub> concentration exceeds 0.8 µg/m<sup>3</sup>). Examples of sensitive receptors are places where people live, play or convalesce, and include schools, hospitals, residential areas and recreation facilities. The Project site is located adjacent to existing residential neighborhoods as well as the immediately adjacent Hilltop Care Convalescent Home. These residents are considered sensitive uses and could include higher-risk populations, such as infants and the elderly.

Construction activities and equipment such as loaders, backhoes, haul truck and vendor trips would generate emissions of diesel-particulate matter (DPM) and PM<sub>2.5</sub> toxic air contaminant (TAC) emissions from exhaust. These emissions could result in elevated concentrations of DPM and PM<sub>2.5</sub> at nearby receptors, and that could lead to an increase in the risk of cancer or other health impacts. The generation of TAC emissions would be temporary, especially considering the short amount of time such equipment would be within an influential distance that could expose sensitive receptors to substantial concentrations.

The BAAQMD does not provide a screening level to determine the size of construction projects that are typically small enough that they are assumed to generate TAC emissions at levels that would not exceed significance thresholds. However, based on the EIR preparer's experience in environmental review for other residential projects and the County's own similar experience, significant emissions of construction-period TACs are not usually indicated for single-family residential projects below approximately 200 dwelling units. Due to the relatively small size of the Project, potential health risks to nearby sensitive receptors due to construction-period TAC emissions are considered less than significant.

#### Mitigation Measures

None needed. However, the Project is required to implement Mitigation Measure AQ-2: Construction Management Practices, which includes several measures that will be effective in further reducing construction-period TAC emissions. These measures include:

- Demonstrating that the off-road equipment (of more than 50 horsepower) to be used during construction achieves a project-wide fleet average of 20% NOX reduction, and 45% PM reduction as compared to the most recent ARB fleet average. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.

- Use of low VOC coatings, beyond the local requirements
- Requiring that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of NOx and PM.
- Requiring that all contractors use equipment that meets CARB's most recent certification standard for off-road heavy duty diesel engines.

### **TAC Emissions and Exposure – Operations**

**AQ-6: TAC Emissions and Exposure during Operations.** Operation of the Project would not be a source of significant levels of toxic air contaminants that could pose a health risk to others. The impact would be less than significant. **(LTS)**

As a residential development, the Project would not be a significant source of TACs and would not subject other sensitive receptors to new sources of TAC emissions.

Future residents of the proposed Project would be new sensitive receptors, and subject to existing ambient air quality conditions. However, because the Project site is located in a predominantly residential neighborhood that does not include any known stationary sources of substantial TAC emissions and is over 1,000 feet from the nearest highway, it is reasonable to conclude that future residents of the Project would not be subjected to substantial concentrations of ambient TAC emissions.<sup>19</sup>

#### Mitigation Measures

None needed.

### **Odors**

**AQ-7: Odors.** The Project would not be a new source of significant levels of construction-period or operational odors. The impact would be less than significant. **(LTS)**

Typical sources of objectionable odors include chemical plants, sewage treatment plants, large composting facilities, rendering plants and other large industrial facilities that emit odorous compounds.<sup>20</sup> As a residential development, the Project would not be a source of significant objectionable odors. During construction, diesel-powered vehicles and equipment would create odors that some may find objectionable. However, these odors would be temporary and not likely to be noticeable beyond the Project site's boundaries. The potential for objectionable odor impacts would be less than significant.

#### Mitigation Measures

None needed.

### **Greenhouse Gas Emissions**

**GHG-1: Greenhouse Gas Emissions.** Construction and operation of the proposed Project would be additional sources of GHG emissions, primarily through consumption of fuel for

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<sup>19</sup> The effects of the environment on the Project is not considered a CEQA impact; CEQA impacts are instead focused on the effects of the Project on the environment. This information pertaining to ambient air quality conditions does not address a CEQA threshold, but is presented for public information purposes, only.

<sup>20</sup> Ibid., Table 3-3.

transportation and energy usage on an ongoing basis. However, additional emissions due to the Project are below threshold levels and are therefore considered a less than significant impact. **(LTS)**

BAAQMD Guidelines provide two alternative quantitative thresholds for GHG emissions, 1) a bright line threshold of 1,100 metric tons of CO<sub>2</sub>e per year (generally for assessment of smaller projects), or 2) an efficiency-based threshold of 4.6 metric tons CO<sub>2</sub>e per service population per year (generally used for larger projects). Service population is defined as the number of residents and employees generated by the Project.

The BAAQMD's 2011 CEQA Guidelines include substantial evidence substantiating operational screening levels for GHG emissions. These screening levels provide a conservative indication of whether a project could result in potentially significant GHG emissions. If a proposed project does not exceed the screening levels, then detailed assessment of the Project's GHG emissions is not warranted, and impacts are deemed to be less than significant. The screening size for GHG emissions from single-family dwellings is 56 units.<sup>21</sup> The Project, at 31 single-family lots, is below this screening level and therefore not anticipated to result in GHG emissions that would exceed threshold levels, and the Project's GHG emissions would be at a level that is less than significant.

#### Mitigation Measures

None needed.

#### **Conflict with GHG Reduction Plans**

**GHG-2: Conflict with GHG Reduction Plans.** The Project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. **(LTS)**

The Alameda County (Unincorporated Areas) Community Climate Action Plan (CCAP) was approved by the Board of Supervisors on February 4, 2014. The CCAP includes actions to accomplish a target reduction in GHG emissions of 15% below the 2005 baseline levels by 2020 through a series of 37 local programs and policy measures related to transportation, land use, building energy, water, waste, and green infrastructure. Development of the Project is required to comply with California Title 24 standards for energy efficiency, as well as the County's Green Building Ordinance, which stipulates that new residential projects must achieve minimum certification under either LEED (Leadership in Energy and Environmental Design) for Homes, the "Build It Green" point rating system, or another nationally recognized program. With required compliance, the Project would be consistent with programs and policy measures identified in the Alameda County CCAP, and the impacts of the Project would be less than significant.

Additionally, BAAQMD's thresholds and methodologies as used in this EIR take into account implementation of state-wide regulations and plans, such as the AB 32 Scoping Plan and adopted state regulations such as Pavley and the low carbon fuel standard. Therefore, there Project would be consistent with these state plans and policies related to GHG reduction.

<sup>21</sup> Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, May 2011, Table 3-1.

### **Cumulative Air Quality and GHG Impacts**

The thresholds of significance for air pollutants and GHG emissions that are used in this EIR consider emission levels at which a project's individual contribution of emissions would be cumulatively considerable. Because the Project's emissions during construction and operation would not exceed these thresholds, they would not have a cumulatively considerable effect.