3.4 Traffic and Transportation

Introduction

This section describes and evaluates issues related to Traffic and Transportation in the context of the proposed Project. Discussed are the physical and regulatory setting; the baseline for determining environmental impacts; the criteria used for determining the significance of environmental impacts; and potential impacts and appropriate mitigation measures when necessary. This section is based on the January 16, 2014 Traffic Impact Study (TIA) by TJKM Transportation Consultants, which is in **Appendix C** of the EIR.

Environmental Setting

This section describes existing conditions in the Project site vicinity, including roadway facilities, bicycle and pedestrian facilities, and available transit service. In addition, existing traffic volumes and operations are presented for both study intersection and freeway segments, including the results of level of service calculations.

Regional Roadways

Regional roadway facilities providing access to the Project site include the State Highway 237 (Highway 237) and U.S. 101 freeways, as well as Central Expressway and Lawrence Expressway. Roadways providing local access include Fair Oaks Avenue, North Wolfe Road, East Arques Avenue, Evelyn Avenue and Maude Avenue. Descriptions of each roadway facility are presented below. Figures for the average number of daily vehicles on local roadways are from roadway counts conducted by the City of Sunnyvale (City of Sunnyvale, 2013 and 2014).

Highway 237 is located northwest of the Project site and provides regional freeway access between the cities of Mountain View and Milpitas. It is an east-west freeway with two mixed-flow lanes between El Camino Real (State Highway 82) and Interstate 880 (I-880), continuing as an arterial east of I-880. Between Mathilda Avenue and I-880, the freeway also includes one high occupancy vehicle (HOV) lane in each direction, which is restricted to vehicles with two or more people, or motorcycles, during the morning (5:00 to 9:00 a.m.) and afternoon/evening (3:00 to 7:00 p.m.) commute periods. In 2012, the HOV lane segments in both directions between North First Street and I-880 were converted to high-occupancy toll (HOT) lanes that connect to existing I-880 HOV facilities. Highway 237 HOT lanes allow single-occupant drivers to pay for use during HOT hours of operation, while vehicles with two or more people continue to travel free. HOT lane hours of operation are identical to HOV lane hours, except that southbound I-880 to westbound Highway 237 morning hours are from 5:00 to 10:00 a.m. Access from Highway 237 in the Project vicinity is provided by full interchanges with Mathilda Avenue and Lawrence Expressway, and partial interchanges with Maude Avenue and Fair Oaks Avenue. Near the Project site, Highway 237 currently averages approximately 90,000 daily vehicles (Caltrans, 2013).

U.S. 101 is located north of the Project site and provides regional freeway access north through the City of San Francisco and south through the City of San Jose. Near the Project site, U.S. 101 is oriented in an east-west direction with approximately 160,000 daily vehicles (Caltrans, 2013). The freeway consists of three mixed-flow lanes and one HOV lane in each direction. Interchanges with Fair Oaks Avenue and Lawrence Expressway provide local access to the Project site.

Central Expressway is a four- to six-lane divided roadway serving Sunnyvale, providing a regional connection between Palo Alto and Santa Clara. Within Sunnyvale, there are auxiliary lanes provided between Mathilda Avenue and North Fair Oaks Avenue. Existing average daily traffic (ADT) on Central Expressway near the Project site is approximately 46,000 vehicles on an average weekday.

Lawrence Expressway is a north-south divided expressway serving Sunnyvale, Santa Clara and Cupertino, providing a regional connection to the Highway 237, U.S. 101 and I-280 freeways. It connects East Caribbean Drive north of Highway 237 and becomes Quito Road in the City of Saratoga. The expressway consists of three mixed-flow lanes and one HOV lane in each direction between U.S. 101 and I-280. Existing ADT on Lawrence Expressway near the Project site is approximately 79,000 vehicles on an average weekday.

Local Roadways

Fair Oaks Avenue is a four-to-six-lane north-south arterial roadway that connects Highway 237 and El Camino Real. Existing ADT on Fair Oaks Avenue near the Project site is approximately 22,000 vehicles on an average weekday.

North Wolfe Road is a north-south arterial roadway. It starts from Fair Oaks Avenue to the north and ends at Stevens Creek Boulevard in Cupertino to the South where it becomes Miller Avenue. Within the City of Sunnyvale, it has a four-to-six-lane cross section. Existing ADT on North Wolfe Road near the Project site is approximately 18,000 vehicles on an average weekday.

East Arques Avenue is an east-west arterial roadway that starts approximately 900 feet west of Sunnyvale Avenue, near Central Expressway, and turns into Scott Boulevard at the eastern City limit and continues into the City of Santa Clara. West of Lawrence Expressway, it has two travel lanes each direction and a center turn lane; and east of Lawrence Expressway, it is a four-lane divided roadway. Existing ADT on East Arques Avenue near the Project site is approximately 11,000 vehicles on an average weekday.

Evelyn Avenue is an east-west arterial roadway that connects downtown Mountain View in the west to Reed Avenue in Sunnyvale to the east. Within the City of Sunnyvale, it has two travel lanes and center turn lane. Existing ADT on Evelyn Avenue near the Project site is approximately 5,700 vehicles on an average weekday.

Maude Avenue is a four-lane, east-west collector roadway from Highway 237 easterly to Mathilda Avenue. East of Mathilda Avenue, it becomes a two-lane roadway and terminates at North Wolfe Road. Maude Avenue forms a partial interchange with Highway 237 that complements the nearby

Highway 237 / Middlefield Road interchange. Existing ADT on Maude Avenue near the Project site is approximately 6,600 vehicles on an average weekday.

Existing Traffic Operating Conditions

Vehicle, bicycle, and pedestrian turning movement counts at all 20 study intersections were either gathered from the 2013 Sunnyvale Transportation Strategic Program Study, from available November 2012 counts or collected anew in March or August 2013. For all study intersections, counts were taken on mid-week weekdays during the 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. periods. The existing weekday a.m. and p.m. peak-hour turning movement volumes at all study intersections, as well as lane configurations and traffic control devices, are shown pictorially in **Appendix C**. Traffic level-of-service operations for the study intersections were evaluated under Existing Conditions for the weekday a.m. and p.m. peak hours.

Level of Service Analysis Methodology

Level of service (LOS) is a qualitative measure that describes operational conditions as they relate to the traffic stream and perceptions by motorists and passengers, in terms of factors such as speed and travel time, delays, freedom to maneuver, traffic interruptions, comfort, convenience and safety. There are six levels of operational service levels, given letter designations from LOS A to LOS F, with LOS A representing the best operating conditions (free-flow) and LOS F the worst (severely congested flow with high delays). Intersections generally are the capacity-controlling locations with respect to traffic operations on arterial and collector streets.

The study intersections were analyzed using the *Highway Capacity Manual 2000* Operations Method contained in the standard traffic software TRAFFIX. This methodology for signalized intersections determines LOS based on average control delay per vehicle for the overall intersection during peak traffic hour. For minor-street stop controlled intersections, LOS is based on and reported for the worst of the minor street approaches. **Table 3.4-1** provides definitions under each of the six level-of-service designations.

Existing Level of Service Conditions at Area Intersections

The study focused on evaluating traffic conditions at 20 study intersections within the City of Sunnyvale that the proposed Project may potentially impact. **Table 3.4-2** summarizes the results of the intersection analysis under Existing Conditions. Detailed LOS calculations are contained in **Appendix C**. Currently, all study intersections are operating within applicable jurisdictional standards of LOS D (City of Sunnyvale local intersection) and LOS E (VTA CMP regional intersection), with the exception of the Commercial Street / Central Expressway intersection, which operates at LOS F during the p.m. peak hour.

Existing Traffic Operating Conditions on Lawrence Expressway

The above-described Existing Conditions LOS analysis is based on an isolated intersection analysis of traffic volumes, rather than analysis of any travel corridor as a whole, and those LOS results can be misleading if a corridor operates under forced-flow traffic conditions. Forced-flow traffic operations can reduce overall vehicle throughput per hour at intersections, leading to LOS

TABLE 3.4-1
DEFINITIONS FOR INTERSECTION LEVEL OF SERVICE

Unsignalized Intersections		Level of Service Grade	Signalized Intersections	
Description	**Average Total Vehicle Delay (Seconds)**		**Average Control Vehicle Delay (Seconds)**	**Description**
No delay for stop-controlled approaches.	≤10.0	A	≤10.0	Free Flow or Insignificant Delays: Operations with very low delay, when signal progression is extremely favorable and most vehicles arrive during the green light phase. Most vehicles do not stop at all.
Operations with minor delay.	>10.0 and ≤15.0	B	>10.0 and ≤20.0	Stable Operation or Minimal Delays: Generally occurs with good signal progression and/or short cycle lengths. More vehicles stop than with LOS A, causing higher levels of average delay. An occasional approach phase is fully utilized.
Operations with moderate delays.	>15.0 and ≤25.0	C	>20.0 and ≤35.0	Stable Operation or Acceptable Delays: Higher delays resulting from fair signal progression and/or longer cycle lengths. Drivers begin having to wait through more than one red light. Most drivers feel somewhat restricted.
Operations with increasingly unacceptable delays.	>25.0 and ≤35.0	D	>35.0 and ≤55.0	Approaching Unstable or Tolerable Delays: Influence of congestion becomes more noticeable. Longer delays result from unfavorable signal progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop. Drivers may have to wait through more than one red light. Queues may develop, but dissipate rapidly, without excessive delays.
Operations with high delays, and long queues.	>35.0 and ≤50.0	E	>55.0 and ≤80.0	Unstable Operation or Significant Delays: Considered to be the limit of acceptable delay. High delays indicate poor signal progression, long cycle lengths and high volume to capacity ratios. Individual cycle failures are frequent occurrences. Vehicles may wait through several signal cycles. Long queues form upstream from intersection.
Operations with extreme congestion, and with very high delays and long queues unacceptable to most drivers.	>50.0	F	>80.0	Forced Flow or Excessive Delays: Occurs with oversaturation when flows exceed the intersection capacity. Represents jammed conditions. Many cycle failures. Queues may block upstream intersections.

SOURCE: Transportation Research Board, *Highway Capacity Manual*, 2000.

TABLE 3.4-2
INTERSECTION LEVELS OF SERVICE (LOS) – EXISTING CONDITIONS

Intersection		Peak Hour	Regional/ Local	LOS Standard	Traffic Control	LOS[a]	Delay[b]
1	Fair Oaks Avenue/ U.S. 101 Northbound Ramps	A.M.	Regional	E	Signal	B-	18.7
		P.M.				C+	22.9
2	Fair Oaks Ave/East Ahwanee Ave	A.M.	Local	D	Signal	C	20.1
		P.M.				B	15.6
3	Fair Oaks Ave/Caliente Drive	A.M.	Local	D	Signal	A	6.1
		P.M.				A	4.7
4	Fair Oaks Ave/East Duane Ave	A.M.	Local	D	Signal	D	36.5
		P.M.				C	29.6
5	Fair Oaks Ave/North Wolfe Road	A.M.	Local	D	Signal	B	17.9
		P.M.				B	17.9
6	Fair Oaks Ave/Maude Ave	A.M.	Local	D	Signal	C	24.8
		P.M.				C	28.7
7	Fair Oaks Ave/East Arques Ave	A.M.	Local	D	Signal	C	28.6
		P.M.				C	31.9
8	North Wolfe Road/Stewart Drive	A.M.	Local	D	Signal	B	10.4
		P.M.				B	13.2
9	North Wolfe Road/East Arques Avenue	A.M.	Local	D	Signal	C	23.0
		P.M.				C	29.2
10	North Wolfe Road/Central Expressway Westbound Ramps	A.M.	Regional	E	Signal	B	15.5
		P.M.				B	17.7
11	North Wolfe Road/Central Expressway Eastbound Ramps	A.M.	Regional	E	Signal	A	9.2
		P.M.				C+	20.4
12	North Wolfe Road/Kifer Road	A.M.	Local	D	Signal	B	18.9
		P.M.				C	26.2
13	North Wolfe Road/Evelyn Avenue	A.M.	Local	D	Signal	C	21.6
		P.M.				B	15.7
14	Lawrence Expressway/ U.S. 101 Northbound Ramps	A.M.	Regional	E	Signal	B	15.2
		P.M.				B	17.7
15	Lawrence Expressway/ U.S. 101 Southbound Ramps	A.M.	Regional	E	Signal	B+	11.3
		P.M.				C+	21.3
16	Lawrence Expwy/Oakmead Prkwy	A.M.	Regional	E	Signal	D+	37.5
		P.M.				D	42.7
17	Lawrence Expwy/East Arques Avenue	A.M.	Regional	E	Signal	C	29.6
		P.M.				D	44.8
18	Lawrence Expressway/Kifer Road	A.M.	Regional	E	Signal	C	28.2
		P.M.				E	74.6
19	Commercial Street/Central Expwy	A.M.	Regional	E	Two-Way Yield	E	49.4
		P.M.				**F**	**55.1**
20	DeGuigne Drive/East Arques Avenue	A.M.	Local	D	Signal	B	16.2
		P.M.				C	20.6

[a] Signalized intersections – Delay / LOS is for overall intersection; Unsignalized two-way yield controlled intersections – Delay / LOS is for critical minor stop-controlled approach.

[b] Delay = Average control delay per vehicle

SOURCE: TJKM (Appendix C)

analysis results that suggest there is less corridor congestion than is actually occurring under existing field conditions. Where there is known congestion, additional analysis of field conditions becomes necessary in order to review and evaluate the extent of forced flow operations.

Based on local experience, segments of Lawrence Expressway in the Project vicinity are known to currently operate under forced-flow conditions, and a field review of existing traffic conditions was conducted on Lawrence Expressway between the U.S. 101 Northbound Ramp and Kifer Road intersections during the prevailing AM and PM commute peak periods. Although Lawrence Expressway has longer signal green times than typical nearby arterial roadways for the northbound and southbound through movements, this segment nonetheless experiences backups at several intersections that impede smooth vehicle progression in both directions. Platoons of vehicles released at upstream intersections can be impeded in flow by existing backups at downstream intersections, as well as weaving traffic from side streets.[1] These congested conditions exist even though some Lawrence Expressway intersections were found in the analysis to operate at LOS B or LOS D, which indicates that vehicle throughput during commute hours is limited due to backups and forced flow conditions. Specific observations from the field review are included in **Appendix C**.

Existing Traffic Operating Conditions on Area Freeways

The following three freeway segments that the proposed Project could adversely affect were evaluated:

1. U.S. 101, Mathilda Avenue to North Fair Oaks Avenue
2. U.S. 101, North Fair Oaks Avenue to Lawrence Expressway
3. U.S. 101, Lawrence Expressway to Great America Parkway

Current traffic operations for the study freeway segments were evaluated for the weekday a.m. and p.m. peak hours. **Table 3.4-3** shows existing freeway LOS for the mixed-flow lanes based on freeway segment densities as reported in Santa Clara Valley Transportation Authority's (VTA) *2012 CMP Monitoring and Conformance Report*. The following freeway segments exceed the VTA operational standard of LOS E or better during specified peak hours:

- U.S. 101 Northbound, North Fair Oaks Avenue to Mathilda Avenue (a.m. peak hour)
- U.S. 101 Northbound, Lawrence Expressway to North Fair Oaks Avenue (a.m. peak hour)
- U.S. 101 Northbound, Great America Parkway to Lawrence Expressway (a.m. peak hour)
- U.S. 101 Southbound, North Fair Oaks Avenue to Lawrence Expressway (p.m. peak hour)
- U.S. 101 Southbound, Lawrence Expressway to Great America Parkway (p.m. peak hour)

[1] An example of weaving traffic is side-street traffic turning right at one signal and slowing down to weave across all lanes on Lawrence to get to the left turn pocket of the next downstream signal.

TABLE 3.4-3
FREEWAY LEVELS OF SERVICE (LOS) – EXISTING CONDITIONS

Freeway Segment	Direction	No. of Lanes[a]	Capacity (vph)[b]	Peak Hour	Avg. Speed (mph)[c]	Volume	Density (pcpmpl)[d]	LOS
U.S. 101, Mathilda Avenue to North Fair Oaks Avenue	Northbound	3	6,900	A.M.	34	6,020	**59.0**	**F**
				P.M.	64	6,340	33.0	D
	Southbound	3	6,900	A.M.	64	6,340	33.0	D
				P.M.	52	6,560	42.1	D
U.S. 101, North Fair Oaks Avenue to Lawrence Expressway	Northbound	3	6,900	A.M.	16	4,470	**93.1**	**F**
				P.M.	65	6,050	31.0	D
	Southbound	3	6,900	A.M.	65	5,660	29.0	D
				P.M.	22	5,150	**78.0**	**F**
U.S. 101, Lawrence Expressway to Great America Parkway	Northbound	3	6,900	A.M.	22	5,220	**79.1**	**F**
				P.M.	58	6,620	38.0	D
	Southbound	3	6,900	A.M.	64	6,340	33.0	D
				P.M.	10	3,510	**117.0**	**F**

[a] Lanes are shown for mixed-flow only because Project trips are assumed as added to mixed-flow lanes only.
[b] Capacity in vehicles per hour.
[c] Average speed in miles per hour (mph).
[d] Density equal to passenger cars per mile per lane (pcpmpl).

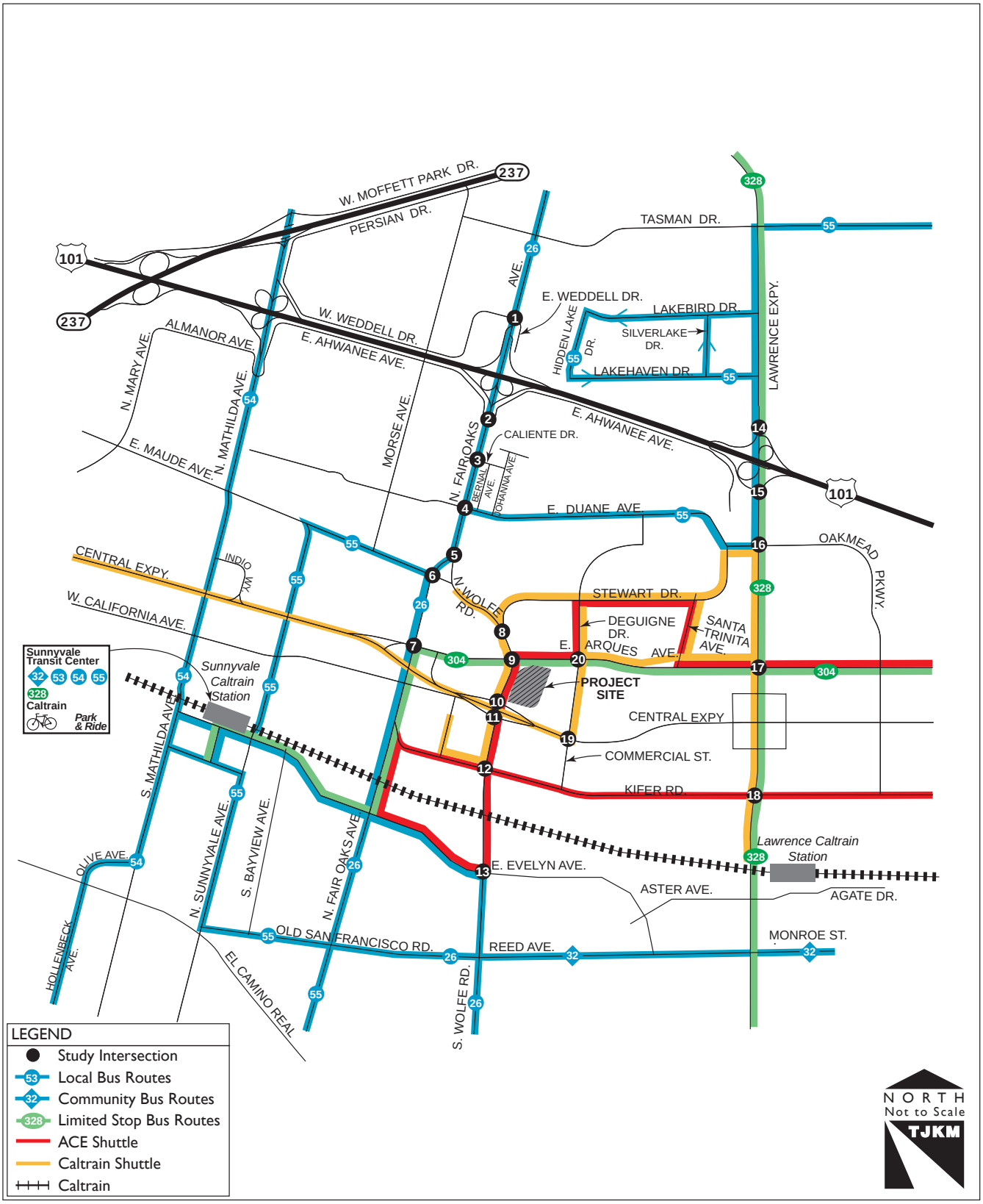
SOURCE: VTA Monitoring and Conformance Report, May 2012.

Transit Service

The Project site is served by public transportation (as shown in **Figure 3.4-1**).The VTA, which operates bus and light rail service within Santa Clara County, runs multiple transit routes through the study area. The Project site is also approximately 1.3-mile walking distance from the Lawrence Caltrain Station, which is longer than the VTA CMP guideline of 2,000 feet reasonable walking distance to a transit stop.

VTA serves the Project study area with five fixed-route bus lines. The Project site is situated near existing bus stops at the intersection of East Arques Avenue / North Wolfe Road. At this intersection, VTA Route 304 stops along westbound East Arques Avenue. At the intersection of East Arques Avenue and Commercial Street, approximately 1/10-mile east of the Project site, VTA Route 304 stops along both eastbound and westbound East Arques Avenue.

In addition to the VTA bus routes, Altamont Commuter Express (ACE) Shuttle Route 822 operates in the vicinity of the Project site, stopping at the East Arques Avenue / North Wolfe Road intersection along southbound North Wolfe Road and the East Arques Avenue / Commercial Street intersection along westbound East Arques Avenue.



SOURCE: TJKM (Appendix C)

Landbank Central & Wolfe Campus . 120442.01

Figure 3.4-1

Existing Transit and Shuttle Service

In addition, the Duane Avenue Caltrain Shuttle serving AMD and other nearby businesses operates in the Project vicinity between the Mountain View Caltrain Station to the west and Lawrence Caltrain Station to the east. The shuttle passes through the Project study area along North Wolfe Road, East Arques Avenue, and Central Expressway.

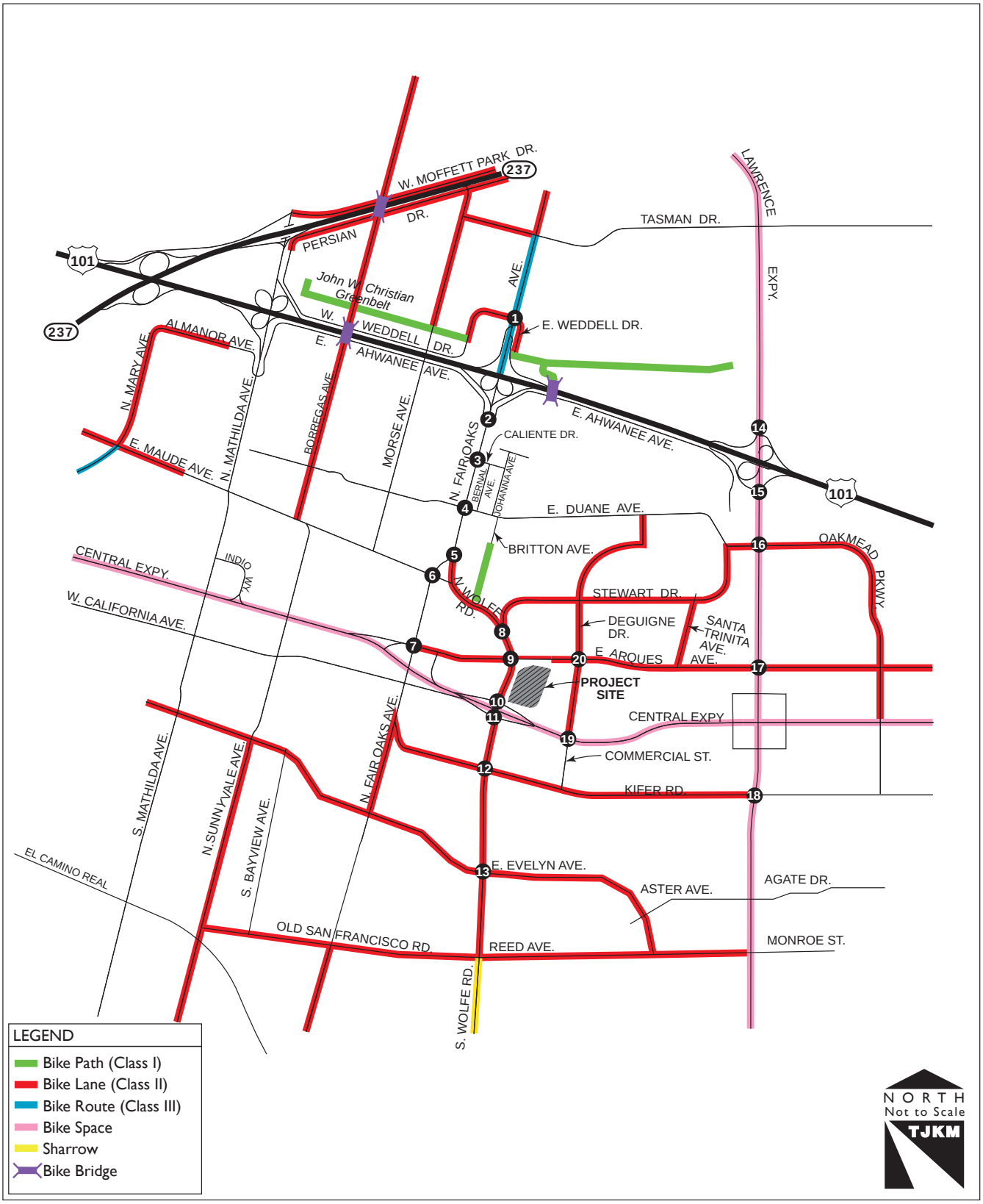
Destinations, days and hours of operation, average commute peak load factors, and service headways for the bus routes serving the immediate Project area are summarized in a table in **Appendix C**. The peak load factors for each of the VTA bus routes and Caltrain Duane Avenue Shuttle are all below 1.0, which represents a line operating with fully occupied seating. Caltrain has an average peak load factor of over 1.0 in the Project vicinity, specifically at Sunnyvale Station during the morning peak.

Bicycle Facilities

Bicycle facilities are classified in three ways: off-street paths separated from auto traffic (Class I), on-street striped lanes (Class II), and on-street signed routes in which bicycles share the roadway with other vehicles (Class III). Existing bicycle facilities in the vicinity of the Project site are shown in **Figure 3.4-2**. In terms of Class I off-street bicycle paths, the path from North Wolfe Road to Britton Avenue along the east side of Fair Oaks Park is closest to the Project site. The John W. Christian Greenbelt is the next closest, located just north of U.S. 101 between Mathilda Avenue and Lawrence Expressway. Currently near the Project site, Class II bicycle lanes are provided along the following roadways:

- East Arques Avenue from North Fair Oaks Avenue to the eastern City limit. Currently, there is a gap in the eastbound Class II bicycle lane along the Project frontage.
- North Wolfe Road from North Fair Oaks Avenue to Reed Avenue
- Commercial Street from Central Expressway to East Arques Avenue
- DeGuigne Drive from East Arques Avenue to East Duane Avenue
- Stewart Drive from North Wolfe Road to Oakmead Parkway
- Kifer Road from North Fair Oaks Avenue to Lawrence Expressway
- Evelyn Avenue from Bernardo Avenue to Reed Avenue
- Central Expressway and Lawrence Expressway – though not explicitly signed or striped as a bicycle lane, the County permits bicycles to ride on the existing wide roadway shoulders

VTA has adopted the Santa Clara Countywide Bicycle Plan (CBP), which guides the development of major bicycling facilities by designating Cross County Bicycle Corridors and identifying bicycle Projects of countywide or intercity significance. Several of these routes travel through the study area, including the North Wolfe Road/Borregas and U.S. 101 Corridors. In addition to the CBP, the City of Sunnyvale has adopted the City's Bicycle Capital Improvement Program (CBCIP), which calls for bikeways to be established on all City arterial and collector streets.



SOURCE: TJKM (Appendix C)

Landbank Central & Wolfe Campus . 120442.01

Figure 3.4-2

Existing Bicycle Facilities

Pedestrian and bicycle volumes were collected at all study intersections in November 2012 and November 2013, except for the intersection of Lawrence Expressway / U.S. 101 NB ramps, which was collected in October 2011. Bicycle and pedestrian volumes at all study intersections are shown in a figure in **Appendix C**.

Pedestrian Facilities

Pedestrian facilities typically consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. Adjacent to the Project, sidewalks are provided on both sides of North Wolfe Road. To the north of the Project site, sidewalks are provided on both sides of East Arques Avenue east of Commercial Street, but only on the north side of East Arques Avenue between North Wolfe Road and Commercial Street. Most study intersections in the Project vicinity include crosswalks and pedestrian signals on all approaches, with the exception of the freeway interchange study intersections and the intersection of Commercial Street / Central Expressway.

Regulatory Setting

Regional

Santa Clara Valley Transportation Authority (VTA)

The VTA is an association of Santa Clara County cities and the County that work together to address issues of regional concern (such as transportation). The VTA carries out the Congestion Management Program (CMP) for Santa Clara County, and in this capacity is responsible for developing, adopting, and updating a biannual CMP.

Santa Clara County Congestion Management Program (CMP)

Adopted as a response to requirements in 1990s Propositions 111 and 108, the Santa Clara County CMP (recently adopted in October 2013) provides mitigation measures and procedures for anticipated increases in County-wide roadway congestion. Administered by the Congestion Management Agency (CMA) within the Santa Clara VTA, the intent of the CMP "…is to develop a comprehensive transportation improvement program among local jurisdictions that will reduce traffic congestion and improve land use decision-making and air quality." (SCVTA, 2013). In addition to specifying the roadway network and establishing LOS criteria for measuring congestion on the network, the biannual CMP includes evaluative performance measures, a land-use impact analysis program, a seven-year Capital Improvement Program designed to maintain or improve transit performance and traffic LOS, and a TDM program. The CMP's TDM program is used to mitigate the impacts related to an increase of at least 100 Project-related net new peak-hour vehicle trips.

Local

City of Sunnyvale General Plan

The Transportation Element of the City of Sunnyvale General Plan, adopted in 2011, sets forth a comprehensive set of policies to guide development over a 10- to 20-year period. The Sunnyvale

General Plan is the primary tool for guiding land use development decisions in the City. The following policies are identified in the Transportation Element of the General Plan:

- **Levels of Service**

  Policy LT-1.4**:** Achieve an operating level-of-service (LOS) of "E" or better for all regional roadways and intersections, as defined by the City functional classification of the street system.

  Policy LT-1.5**:** Maintain a functional classification of the street system that identifies Congestion Management Program roadways and intersections, as well as local roadways and intersections of regional significance.

  Policy LT-5.1**:** Achieve an operating level-of-service (LOS) of "D" or better on the City-wide roadways and intersections, as defined by the functional classification of the street system.

  Policy LT-5.2**:** Integrate the use of land and transportation system.

  Policy LT-5.5**:** Support a variety of transportation modes.

  Policy LT-5.6**:** Minimize expansion of the current roadway system, which maximizing opportunities for alternative transportation systems and related programs.

  Policy LT-5.8**:** Provide a safe and comfortable system of pedestrian and bicycle pathways.

  Policy LT-5.9**:** Appropriate accommodations for motor vehicles, bicycles, and pedestrians shall be determined for City streets to increase the use of bicycles for transportation and to enhance the safety and efficiency of the overall street network for bicyclists, pedestrians, and motor vehicles.

City of Sunnyvale Municipal Code

Chapter 10.60 of the City of Sunnyvale Municipal Code sets forth the City's Transportation Demand Management program. Section 19.46.100 of the Municipal Code sets forth minimum and maximum requirements for off-street parking spaces. Section 19.46.150 sets forth minimum requirements for bicycle parking (number and type of spaces).

Impacts and Mitigation Measures

Significance Thresholds

Based on the California Environmental Quality Act (CEQA) *Guidelines* Appendix G, a project could have a significant impact related to traffic and transportation if it would do any of the following:

- Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit, non-motorized travel, and relevant components of the circulation system (including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit);

- Conflict with an applicable congestion management program, including but not limited to level of service (LOS) standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in locations that results in substantial safety risks;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Result in inadequate emergency access; or
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

The study intersections fall within City of Sunnyvale jurisdiction, but are subject to different traffic operational standards depending on whether they are monitored as part of the VTA's CMP. The LOS standard for signalized intersections under City of Sunnyvale jurisdiction is LOS D, except for City intersections that are designated as regionally significant and accordingly have a LOS E standard (which also is the LOS standard for intersections under Santa Clara County jurisdiction). Traffic impacts due to implementation of a proposed Project occur when:

- Non-regionally-significant City intersection operations deteriorate from LOS D or better (acceptable) under the baseline conditions to LOS E or F (unacceptable), or
- Regionally significant intersection and County intersection operations deteriorate from LOS E or better (acceptable) to LOS F (unacceptable); for purposes of this EIR, applicable intersections are along Lawrence Expressway, and ramp junctions at Central Expressway and U.S. 101.
- Unacceptable operations are exacerbated by increasing average critical delay by more than four seconds and increasing the critical volume-to-capacity (v/c) ratio by 0.01 or more at a City intersection operating at LOS E or F (LOS F for regionally significant intersections and County intersections).

The City of Sunnyvale has not officially adopted significance criteria for unsignalized intersections. Based on previous studies in the City of Sunnyvale, a standard of LOS E has been applied for minor intersection approaches.

According to VTA's 2009 *Transportation Impact Analysis Guidelines*, a freeway segment analysis should be conducted if a proposed Project meets one of the following criteria:

- It is expected to add traffic equal to at least one percent of a freeway segment's capacity.
- It is adjacent to one of the freeway segment's access or egress points.
- Based on engineering judgment, Lead Agency staff determines that the freeway segment should be included in the analysis.

Approach to Analysis

The traffic and transportation impacts of the proposed Project are discussed below. First, the method used to estimate the amount of traffic added to the roadway system by the Project is described. Then, the results of the intersection levels of service calculations with the Project conditions are presented under existing plus Project and cumulative conditions. The Project's impact to alternative modes of transportation (i.e., transit, bicycles and pedestrians), safety, and access are also discussed.

The amount of traffic associated with a Project is estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. In the first step, the amount of traffic entering and exiting the site is estimated. In the second step, the directions the trips use to approach and depart the site are projected. The trips are then assigned to specific street segments and intersection turning movements in the third step.

Impact Analysis Scenarios

1. **Existing plus Project Conditions** – this scenario is identical to Existing Conditions (2013 roadway conditions, traffic controls, lane geometry, and traffic volumes collected for this EIR), but with the addition of traffic generated by the proposed Project.

2. **Background Conditions** – this scenario is identical to Existing Conditions, but with the addition of traffic generated by the approved City of Sunnyvale developments that are not yet built or occupied, but does not include the proposed Project.

3. **Background plus Project Conditions** – this scenario is identical to Background Conditions, but with the addition of traffic generated by the proposed Project.

4. **Cumulative Conditions** – this scenario is based on existing traffic volumes that are increased using annual growth rates based on the City traffic model to year 2023 (ten years from Existing Conditions).

5. **Cumulative plus Project Conditions** – this scenario is identical to Cumulative Conditions, but with the addition of traffic generated by the proposed Project. The impact analysis for this scenario is included in Chapter 4, Cumulative and Growth Inducing Impacts.

Traffic Impact Analysis

Existing Plus Project Conditions

Impact TR-1: The Project would increase traffic volumes at area intersections, affecting traffic flow conditions. (Significant)

Project Trip Generation

Estimated trip generation was developed for the proposed Project based on published data for Research and Development (R&D) Centers (ITE Code 760) in the 9th Edition of the Institute of Transportation Engineers' (ITE) *Trip Generation Manual* (ITE, 2012). In terms of trip reduction strategies, the proposed Project is eligible for a maximum five percent discount provided that it participates in a transportation demand management (TDM) program. As described in the VTA

TIA guidelines, VTA recognizes such a trip reduction if a TDM program is provided for all Project employees in the form of either financial incentives such as monthly transit passes or a shuttle service. The Project applicant would be required to develop a TDM plan that includes financial incentives and/or a shuttle service. The City does not prescribe specific TDM measures, but rather requires absolute reduction of trips. Typically to achieve such a reduction, TDM plans incorporate effective measures such as financial incentives or shuttle service.

In calculating trip generation, a trip discount was applied that accounts for the existing 258,721 square feet of R&D uses. **Table 3.4-4** shows the estimated trip generation for the proposed Project, including the VTA standard five-percent TDM trip adjustment allowed for this TIA and the reduction for existing R&D uses. With this adjustment, the proposed Project is expected to generate about 3,023 new daily vehicle trips, including 438 trips during the a.m. peak hour and 397 trips during the p.m. peak hour.

TABLE 3.4-4
PROPOSED PROJECT TRIP GENERATION

Land Use (ITE Code)	Size	Daily Trips	A.M. Peak Hour			P.M. Peak Hour		
			In	Out	Total	In	Out	Total
Research and Development Center (Code 760)	777,170 sf	5,509	642	131	773	109	615	724
TDM Reduction (5 percent)[a]		-275	-32	-7	-39	-5	-31	-36
Existing Use Discount Research and Development Center (Code 760)	258,721 sf	-2,211	-246	-50	-296	-44	-247	-291
Totals (With TDM Reduction)		**3,023**	**364**	**74**	**438**	**60**	**337**	**397**

[a] Five percent transportation demand management (TDM) is maximum reduction from VTA Transportation Impact Analysis Guidelines allowed for employers providing financial incentives and shuttle provisions to reduce single-occupant driving to the site.

SOURCES: Trip Generation Manual (ITE, 9th Edition, 2012), VTA Transportation Impact Analysis Guidelines (2009); Existing land use discount per City of Sunnyvale.

The Project applicant has prepared a TDM Program that establishes a goal of 20% reduction in peak hour trips (Fehr and Peers, 2013). However, the applicant's TDM Program merely selects recommended measures, and does not constitute a clear commitment on the part of the applicant to implement all of the recommended measures. Neither does the TDM Program demonstrate how, when taken together, the recommended measures would achieve the trip reduction goal, or what contingency measures would be taken in the event that the goal is not reached. For these reasons, the applicants' TDM Program is not considered a part of the Project for the purpose of calculating trip generation, though the City will require implementation of an approved TDM program. Full implementation of the applicant's TDM Program is analyzed as an Alternative in Chapter 5, Alternatives.

Project Trip Distribution and Assignment

Trip distribution is a process that determines in what proportion vehicles would be expected to travel between a Project site and various destinations outside the Project study area. The process of trip assignment determines the various routes that vehicles would take from the Project site to each destination using the calculated trip distribution.

Trip distribution assumptions for the proposed Project were developed based on a select zone analysis using the Sunnyvale Travel Forecasting Model, knowledge of the study area, and consultation with City transportation staff. The assigned Project trips were then added to Existing Conditions traffic volumes to generate Existing plus Project traffic volumes. **Figure 3.4-3** depicts the studied intersections and the initial trip distribution estimates.

Intersection Level of Service Analysis Results

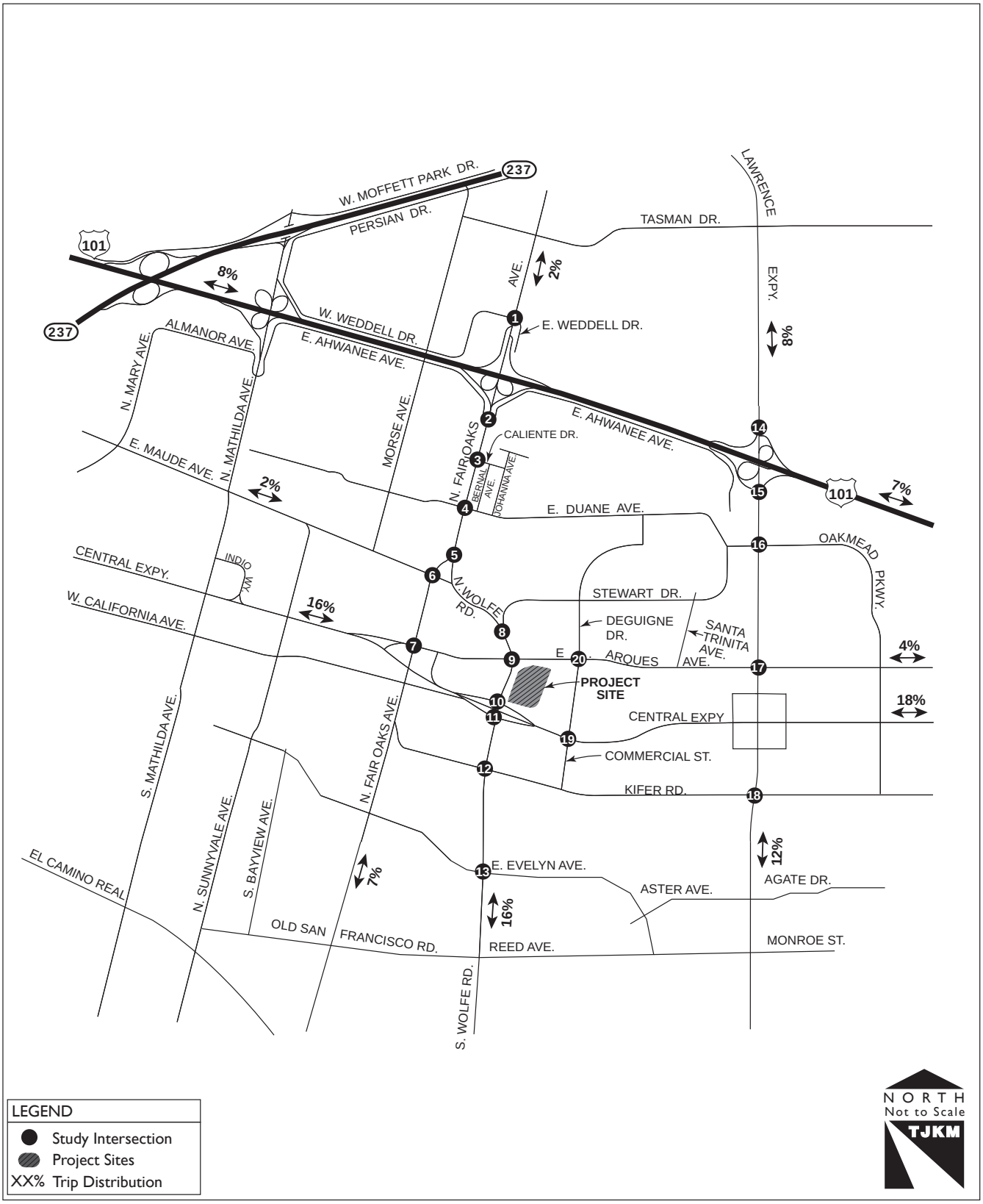
The intersection LOS analysis results for Existing plus Project Conditions are summarized in **Table 3.4-5**. Detailed calculation sheets are contained in **Appendix C**. Almost all of the study intersections would operate within applicable jurisdictional standards of LOS D (City of Sunnyvale) and LOS E (VTA CMP) after the addition of Project-generated trips, with the exception of the Commercial Street / Central Expressway intersection (which is expected to operate at LOS F during both a.m. and p.m. peak hour). The Project impact at the Commercial Street / Central Expressway intersection is considered to be significant.

A signal warrant analysis revealed that Warrant 3, peak hour volume signal warrant (Caltrans, 2012) would be met during the p.m. peak hour under Existing plus Project Conditions. Detailed calculation sheets are contained in **Appendix C**.

The curb-to-curb width of the north and south legs of Commercial Street are sufficiently wide to accommodate the reconfigured lanes, as well as the existing and proposed bi-directional bicycle lanes immediately north and south of Central Expressway (described further under Bicycle Access Evaluation, below).

The Existing plus Project Conditions analysis does not identify deficient service levels at the Project intersections along Lawrence Expressway. However, as identified in the Setting, a field evaluation of vehicle progression on Lawrence Expressway in the Project vicinity revealed substantial vehicle queues that impede vehicle throughput. Because the proposed Project would add traffic volumes to this segment of Lawrence Expressway under Existing plus Project Conditions, current queues would be exacerbated. However, based on the preceding LOS analysis, the increased traffic due to the proposed Project would not meet CMP traffic impact definitions at any of the Lawrence Expressway study intersections.

In addition, the City of Sunnyvale has developed a Traffic Impact Fee (TIF) program that covers fair share contributions to major transportation improvement Projects planned by Santa Clara County, the City of Sunnyvale, and the City of Santa Clara. Given that the proposed Project would add traffic to current poorly-operating conditions on Lawrence Expressway, the proposed Project would be required to contribute a proportionate fair share to planned improvements for



SOURCE: TJKM (Appendix C)

Landbank Central & Wolfe Campus . 120442.01

Figure 3.4-3

Estimated Trip Distribution

TABLE 3.4-5
INTERSECTION LEVELS OF SERVICE (LOS) – EXISTING PLUS PROJECT CONDITIONS

	Intersection	Peak Hour	Regional/ Local	LOS Standard	Traffic Control	Existing		Existing plus Project	
						LOS[a]	Delay[b]	LOS[a]	Delay[b]
1	North Fair Oaks Avenue/ U.S. 101 NB Ramps	A.M.	Regional	E	Signal	B-	18.7	B-	18.8
		P.M.				C+	22.9	C	24.5
2	North Fair Oaks Avenue/ East Ahwanee Avenue	A.M.	Local	D	Signal	C	20.1	C	20.1
		P.M.				B	15.6	B	15.6
3	North Fair Oaks Avenue/ Caliente Drive	A.M.	Local	D	Signal	A	6.1	A	6.1
		P.M.				A	4.7	A	4.7
4	North Fair Oaks Avenue/ East Duane Avenue	A.M.	Local	D	Signal	D	36.5	D	36.5
		P.M.				C	29.6	C	29.6
5	North Fair Oaks Avenue/ North Wolfe Road	A.M.	Local	D	Signal	B	17.9	B	18.1
		P.M.				B	17.9	B	17.9
6	North Fair Oaks Avenue/ Maude Avenue	A.M.	Local	D	Signal	C	24.8	C	24.8
		P.M.				C	28.7	C	28.8
7	North Fair Oaks Avenue/ East Arques Avenue	A.M.	Local	D	Signal	C	28.6	C	28.8
		P.M.				C	31.9	C	32.4
8	North Wolfe Road/ Stewart Drive	A.M.	Local	D	Signal	B	10.4	B	10.4
		P.M.				B	13.2	B	13.2
9	North Wolfe Road/ East Arques Avenue	A.M.	Local	D	Signal	C	23.0	C	25.0
		P.M.				C	29.2	C	30.2
10	North Wolfe Road/Central Expressway WB Ramps	A.M.	Regional	E	Signal	B	15.5	B	16.2
		P.M.				B	17.7	B	17.9
11	North Wolfe Road/Central Expressway EB Ramps	A.M.	Regional	E	Signal	A	9.2	B+	11.9
		P.M.				C+	20.4	C+	21.0
12	North Wolfe Road/ Kifer Road	A.M.	Local	D	Signal	B	18.9	B	18.9
		P.M.				C	26.2	C	26.2
13	North Wolfe Road/ Evelyn Avenue	A.M.	Local	D	Signal	C	21.6	C	21.6
		P.M.				B	15.7	B	15.7
14	Lawrence Expressway/ U.S. 101 NB Ramps	A.M.	Regional	E	Signal	B	15.2	B	15.4
		P.M.				B	17.7	B	17.9
15	Lawrence Expressway/ U.S. 101 SB Ramps	A.M.	Regional	E	Signal	B+	11.3	B+	11.3
		P.M.				C+	21.3	C+	21.3
16	Lawrence Expressway/ Oakmead Parkway	A.M.	Regional	E	Signal	D+	37.5	D+	37.5
		P.M.				D	42.7	D	42.7
17	Lawrence Expressway/ East Arques Avenue	A.M.	Regional	E	Signal	C	29.6	C	29.9
		P.M.				D	44.8	D	45.5
18	Lawrence Expressway/ Kifer Road	A.M.	Regional	E	Signal	C	28.2	C	28.2
		P.M.				E	74.6	E	74.6
19	Commercial Street/ Central Expressway	A.M.	Regional	E	Two-Way Yield	E	49.4	**F/ 0.58[c]**	**60.9**
		P.M.				**F/ 0.78[c]**	**55.1**	**F/ 1.06[c]**	**114.1**
20	DeGuigne Drive/ East Arques Avenue	A.M.	Local	D	Signal	B	16.2	B	16.6
		P.M.				C	20.6	C	20.6

[a] Signalized intersections – Delay / LOS is for overall intersection; Unsignalized two-way yield controlled intersections – Delay / LOS is for critical minor stop-controlled approach.
[b] Delay = Average control delay per vehicle
[c] Critical v/c values are reported for the intersection operating at unacceptable LOS.

Bold indicates LOS exceeds applicable jurisdictional standards for operating conditions.

SOURCE: TJKM (Appendix C)

the Lawrence Expressway corridor. The Project fair share TIF contribution, which would be used to fund a City share of Lawrence Expressway improvements, constitutes a reasonable means of addressing traffic issues on Lawrence Expressway to which the Project would contribute.

Also, the City does not have a formal threshold for queuing impacts, but rather treats queuing issues as operational issues unless overall intersection LOS thresholds are exceeded. Thus, the exacerbation of vehicle queues due to the proposed Project is not considered to be a significant impact.

Mitigation Measure

> **Mitigation Measure TR-1:** The City of Sunnyvale, in cooperation with Santa Clara County, shall reconstruct/reconfigure the Commercial Street / Central Expressway intersection to a full four-legged signalized intersection, with eastbound and westbound left-turn lanes on Central Expressway, and restriping northbound and southbound Commercial Street for one shared left-turn/through lane and one exclusive right turn lane, or as may be approved by Santa Clara County.
>
> With implementation of Mitigation Measure TR-1, operations at this intersection would improve to LOS D or better. With implementation of Mitigation Measure TR-1, it is expected that some local existing traffic in the vicinity of this intersection would be re-distributed. This would not, however, be expected to adversely affect any of the study intersections to the extent that LOS would decrease.
>
> **Significance after Mitigation: *Significant and Unavoidable*.** This Project impact would be significant and unavoidable because it is not certain that the measure could be implemented. The City of Sunnyvale, as lead agency, could not implement Measure TR-1 without the approval of Santa Clara County. However, in the event that Mitigation Measure TR-1 could be implemented, the impact would be less than significant.

Background Plus Project Conditions

Impact TR-2: The Project, in combination with approved developments in the study area that are not yet built or occupied, would increase traffic volumes at area intersections, affecting traffic flow conditions. (Significant)

This impact discussion details expected traffic conditions at the study intersections under Background Conditions (without and with the proposed Project). Traffic volumes under background baseline conditions consist of existing traffic volumes plus traffic expected to be generated by approved developments in the study area that are not yet built or occupied. Project-generated trips added to the background baseline condition are identical to those assumed under Existing plus Project Conditions.

Approved and Not-Occupied Developments

There are numerous approved and not-yet-occupied developments within the study area. The 22 such development Projects assumed under this analysis scenario, and their vehicle trip generation estimates, are described in detail in **Appendix C**.

Background Transportation Improvements

For the year 2015, no approved and funded transportation network improvements were assumed to be completed prior to occupancy of the proposed Project. Therefore, the existing conditions roadway network, traffic controls, and lane geometries are assumed for Background Conditions.

Intersection Level of Service Analysis Results

The intersection LOS analysis results for the Background No Project and Background plus Project conditions are summarized in **Table 3.4-6**. Detailed calculation sheets are contained in **Appendix C**, as well as figures showing traffic volumes at the study intersections resulting from the approved development traffic (Background No Project), and traffic volumes for the Background plus Project conditions. All study intersections would operate within applicable jurisdictional standards of LOS D (City of Sunnyvale) and LOS E (VTA CMP) after the addition of Project-generated trips, with the exception of the Commercial Street / Central Expressway intersection (LOS F during both a.m. and p.m. peak hours). The Project impact at the Commercial Street / Central Expressway intersection is considered to be significant.

The above-described analysis does not identify deficient service levels at the Project intersections along Lawrence Expressway. However, as identified in the Setting and as part of the Existing plus Project analysis, field evaluation of vehicle progression on Lawrence Expressway revealed substantial vehicle queues that impede vehicle throughput. Although the proposed Project would add traffic volumes to this segment of Lawrence Expressway, the increased traffic due to the proposed Project would not meet CMP traffic impact definitions at any of the Lawrence Expressway study intersections. Also, the City treats queuing issues as operational issues unless overall intersection LOS thresholds are exceeded. Thus, the exacerbation of vehicle queues due to the proposed Project is not a significant impact.

In addition, the proposed Project would be required to contribute a proportionate fair share to the City's TIF program, which covers fair share contributions to major transportation improvement Projects planned by Santa Clara County, the City of Sunnyvale, and the City of Santa Clara. The Project fair share TIF contribution constitutes a reasonable means of addressing traffic issues on Lawrence Expressway to which the Project would contribute.

Mitigation Measure

> **Mitigation Measure TR-2:** Implement Mitigation Measure TR-1 (reconstruct/reconfigure the Commercial Street / Central Expressway intersection to a full four-legged signalized intersection, with eastbound and westbound left-turn lanes on Central Expressway, and restriping northbound and southbound Commercial Street for one shared left-turn/through lane and one exclusive right turn lane). As was described for Mitigation Measure TR-1, the peak hour volume signal warrant (Warrant 3) would be met during the p.m. peak hour under Existing plus Project Conditions. With implementation of Mitigation Measure TR-1, operations at this intersection would improve to LOS D or better.
>
> **Significance after Mitigation: *Significant and Unavoidable*.** This Project impact would be significant and unavoidable because it is not certain that the measure could be implemented. The City of Sunnyvale, as lead agency, could not implement Measure TR-1 without the approval of Santa Clara County. However, in the event that Mitigation Measure TR-1 could be implemented, the impact would be less than significant.

TABLE 3.4-6
INTERSECTION LEVELS OF SERVICE (LOS) – BACKGROUND PLUS PROJECT CONDITIONS

Intersection		Peak Hour	Regional/ Local	LOS Standard	Traffic Control	Background		Background plus Project	
						LOS[a]	Delay[b]	LOS[a]	Delay[b]
1	North Fair Oaks Avenue/ U.S. 101 NB Ramps	A.M.	Regional	E	Signal	C+	20.2	C+	20.4
		P.M.				C	27.5	C	30.1
2	North Fair Oaks Avenue/ East Ahwanee Avenue	A.M.	Local	D	Signal	B	17.3	B	17.3
		P.M.				B	15.4	B	15.4
3	North Fair Oaks Avenue/ Caliente Drive	A.M.	Local	D	Signal	A	5.5	A	5.5
		P.M.				A	4.7	A	4.7
4	North Fair Oaks Avenue/ East Duane Avenue	A.M.	Local	D	Signal	D	36.4	D	36.4
		P.M.				C	29.4	C	29.4
5	North Fair Oaks Avenue/ North Wolfe Road	A.M.	Local	D	Signal	B	18.6	B	18.6
		P.M.				B	18.0	B	18.0
6	North Fair Oaks Avenue/ Maude Avenue	A.M.	Local	D	Signal	C	26.0	C	26.0
		P.M.				C	29.5	C	29.5
7	North Fair Oaks Avenue/ East Arques Avenue	A.M.	Local	D	Signal	C	28.7	C	28.9
		P.M.				C	32.4	C	32.9
8	North Wolfe Road/ Stewart Drive	A.M.	Local	D	Signal	B	10.3	B	10.3
		P.M.				B	12.1	B	12.1
9	North Wolfe Road/ East Arques Avenue	A.M.	Local	D	Signal	C	23.4	C	25.2
		P.M.				C	29.7	C	30.7
10	North Wolfe Road/Central Expressway WB Ramps	A.M.	Regional	E	Signal	B	15.5	B	16.5
		P.M.				B	17.7	B	17.9
11	North Wolfe Road/Central Expressway EB Ramps	A.M.	Regional	E	Signal	A	9.9	B	12.3
		P.M.				C+	20.6	C+	21.1
12	North Wolfe Road/ Kifer Road	A.M.	Local	D	Signal	B	18.8	B	18.8
		P.M.				C	26.0	C	26.0
13	North Wolfe Road/ Evelyn Avenue	A.M.	Local	D	Signal	C	20.4	C	20.4
		P.M.				B	15.6	B	15.6
14	Lawrence Expressway/ U.S. 101 NB Ramps	A.M.	Regional	E	Signal	B	15.0	B	15.2
		P.M.				B-	18.0	B-	18.0
15	Lawrence Expressway/ U.S. 101 SB Ramps	A.M.	Regional	E	Signal	B+	10.7	B+	10.7
		P.M.				C+	21.7	C+	21.7
16	Lawrence Expressway/ Oakmead Parkway	A.M.	Regional	E	Signal	D+	37.9	D+	37.9
		P.M.				D	40.1	D	40.1
17	Lawrence Expressway/ East Arques Avenue	A.M.	Regional	E	Signal	C	29.6	C	30.0
		P.M.				D	46.0	D	46.9
18	Lawrence Expressway/ Kifer Road	A.M.	Regional	E	Signal	C	28.2	C	28.2
		P.M.				E	74.3	E	74.3
19	Commercial Street/ Central Expressway	A.M.	Regional	E	Two-Way Yield	**F/ 0.50[c]**	**56.6**	**F/ 0.63[c]**	**71.7**
		P.M.				**F/ 0.81[c]**	**61.0**	**F/ 1.10[c]**	**128.8**
20	DeGuigne Drive/ East Arques Avenue	A.M.	Local	D	Signal	B	9.4	B	9.7
		P.M.				B	19.9	B	19.9

[a] Signalized intersections – Delay / LOS is for overall intersection; Unsignalized two-way yield controlled intersections – Delay / LOS is for critical minor stop-controlled approach.
[b] Delay = Average control delay per vehicle
[c] Critical v/c values are reported for the intersection operating at unacceptable LOS.

Bold indicates LOS exceeds applicable jurisdictional standards for operating conditions.

SOURCE: TJKM (Appendix C)

Freeway Level of Service Analysis Results

Impact TR-3: The Project would increase traffic volumes on area freeways, affecting traffic flow conditions. (Less than Significant)

For conservative analysis purposes, Project-generated trips were only assigned to the mixed-flow lanes on area freeways, and none were assigned to the HOV lanes. **Table 3.4-7** shows the estimated number of Project trips added to each study freeway segment, as well as estimated freeway densities and service levels that would result from proposed Project traffic. As shown in the table, the following freeway segments would exceed the VTA operational standard of LOS E or better during specified peak hours, without or with the added Project traffic:

- U.S. 101 Northbound, North Fair Oaks Avenue to Mathilda Avenue (a.m. peak hour)
- U.S. 101 Northbound, Lawrence Expressway to North Fair Oaks Avenue (a.m. peak hour)
- U.S. 101 Northbound, Great America Parkway to Lawrence Expressway (a.m. peak hour)
- U.S. 101 Southbound, North Fair Oaks Avenue to Lawrence Expressway (p.m. peak hour)
- U.S. 101 Southbound, Lawrence Expressway to Great America Parkway (p.m. peak hour)

TABLE 3.4-7
FREEWAY LEVELS OF SERVICE (LOS) – EXISTING PLUS PROJECT CONDITIONS

Freeway Segment	Direction	No. of Lanes[a]	Capacity[b]	Peak Hour	Existing (Year 2012)				Existing plus Project			
					Average Speed[c]	Volume	Density[d]	LOS	Project Trips	Density	LOS	% Impact
U.S. 101, Mathilda Avenue to North Fair Oaks Avenue	NB	3	6,900	A.M.	34	6,020	59.0	F	6	59.1	F	0.1%
				P.M.	64	6,340	33.0	D	27	33.2	D	0.4%
	SB	3	6,900	A.M.	64	6,340	33.0	D	29	33.2	D	0.4%
				P.M.	52	6,560	42.1	D	5	42.1	D	0.1%
U.S. 101, North Fair Oaks Avenue to Lawrence Expwy	NB	3	6,900	A.M.	16	4,470	93.1	F	0	93.1	F	0.0%
				P.M.	65	6,050	31.0	D	0	31.0	D	0.0%
	SB	3	6,900	A.M.	65	5,660	29.0	D	0	29.0	D	0.0%
				P.M.	22	5,150	78.0	F	0	78.0	F	0.0%
U.S. 101, Lawrence Expwy to Great America Parkway	NB	3	6,900	A.M.	22	5,220	79.1	F	25	79.5	F	0.4%
				P.M.	58	6,620	38.0	D	4	38.1	D	0.1%
	SB	3	6,900	A.M.	64	6,340	33.0	D	6	33.1	D	0.1%
				P.M.	10	3,510	117.0	F	24	117.8	F	0.3%

[a] Lanes are shown for mixed-flow only because Project trips are assumed as added to mixed-flow lanes only.
[b] Capacity in vehicles per hour per lane.
[c] Average speed in miles per hour (mph).
[d] Density equal to passenger cars per mile per lane (pcpmpl).

SOURCES: VTA Monitoring and Conformance Report, May 2012, and TJKM (Appendix C)

However, as shown in the table, the proposed Project would not add trips greater than one percent of the capacity of any freeway segment already operating at LOS F under Existing Conditions, which is considered a less-than-significant impact.

Mitigation: None required.

Traffic Safety Evaluation

Impact TR-4: The Project would increase traffic volumes on area roadways and at area intersections, potentially affecting traffic safety. (Significant)

Another reason for signalizing the Commercial Street / Central Expressway intersection (Mitigation Measure TR-1) is the potential safety improvements that could be gained. The most-recent five-year collision history was reviewed at this intersection and the segment of Central Expressway between the North Wolfe Road and Lawrence Expressway interchanges. Collision rates were analyzed and compared with statewide and Santa Clara County average rates.

The annual average collision rate at the intersection of Commercial Street and Central Expressway is less than the statewide average rate; therefore, it is not considered to be a hazardous intersection. However, the collision rate for the Central Expressway segment between North Wolfe Road and Lawrence Expressway that includes the existing Commercial Street ramps is more than double the average rate for Santa Clara County.

Implementation of Mitigation Measure TR-1 (reconstruct/reconfigure the Commercial Street / Central Expressway intersection to a full four-legged signalized intersection, with eastbound and westbound left-turn lanes on Central Expressway, and restriping northbound and southbound Commercial Street for one shared left-turn/through lane and one exclusive right turn lane) would improve local connections and safety for pedestrians. Pedestrians would have a new signalized crossing that connects the neighborhoods served by the north and south legs of Commercial Street (currently separated by a median). This new connection would facilitate walking to the Lawrence Caltrain Station, located approximately 1.3 miles from the Project site by allowing pedestrians to safely access local streets with lower traffic demand than Lawrence Expressway and North Wolfe Road in the Project vicinity.

In terms of the deficient weaving segment, the Santa Clara County Roads Department has identified a Central Expressway Project that would add auxiliary lanes in both directions between North Wolfe Road and Lawrence Expressway. The purpose of the Central Expressway Project is to address the high rate of collisions and weaving maneuvers along this segment. The proposed Project would contribute additional traffic volumes and entering/exiting weaving maneuvers that would exacerbate this existing road segment deficiency.

Mitigation Measure

> **Mitigation Measure TR-4:** The proposed Project would contribute a fair share payment (proportionate to added proposed Project traffic volumes) to the Santa Clara County Roads Department's Central Expressway Project that would add auxiliary lanes in both directions between North Wolfe Road and Lawrence Expressway.

Significance after Mitigation: ***Less than Significant.***

Traffic Hazard Impacts

Impact TR-5: The Project would not substantially increase hazards due to a design feature or incompatible uses. (Less than Significant)

The Project would not alter the roadway network currently serving the Project site (including the access driveways) in any substantial way, and would not introduce traffic that is incompatible with existing traffic. The Project impact on traffic hazards would be less than significant.

Mitigation: None required.

Emergency Access

Impact TR-6: The Project would not result in inadequate emergency access. (Less than Significant)

The roadway network serving the Project site currently accommodates the movements of emergency vehicles that travel in the area. In the event of an emergency, vehicles would access the site similar to existing conditions. The Project's impact to emergency vehicle access, therefore, would be less than significant.

Mitigation: None required.

Transit Impacts

Impact TR-7: The Project would not conflict with existing or planned transit facilities. (Less than Significant)

As discussed in the Setting, the proposed Project has access to five close-in VTA bus routes and the Caltrain service (within 1.3 miles of the Project site, though that is greater than the VTA CMP guideline of 2,000 feet reasonable walking distance to a transit stop). The bus stops and Caltrain station are accessible via sidewalks for pedestrians and roadways for bicyclists on a relatively flat terrain amenable to these transportation modes. In addition, the average commute peak hour load factors on the five VTA bus routes in the Project study area and Caltrain Duane Avenue Shuttle are well below capacity (see **Appendix C**). Therefore, there are no known significant impacts that would occur on these transit lines even if the full VTA TDM reductions were shifted to just these public transit lines and not to carpools, bicyclists, pedestrians, or other transit lines.

Caltrain has an average maximum peak load factor of over 1.0 in the Project vicinity (see **Appendix C**), specifically at Sunnyvale Station during the morning peak, which means more riders than can be accommodated in seats. It is expected that Caltrain would still be able to accommodate additional riders using available standing room capacity. Therefore, no significant impact on existing Caltrain operations is anticipated from the potential addition of transit riders generated by the proposed Project.

Implementation of Mitigation Measure TR-1 (creating an at-grade signalized intersection at Commercial Street and Central Expressway) would allow northbound and southbound through vehicle movements on Commercial Street across Central Expressway. This mitigation measure would not only improve auto operational conditions at Commercial Street and Central Expressway, but also improve non-auto, multimodal access between the Project site and the Lawrence Caltrain Station. To take advantage of the new intersection, it is suggested that new bus stops be added on Commercial Street, and the current Duane Avenue Caltrain Shuttle be rerouted through Commercial Street and Kifer Road. These measures, which are not required to reduce any impact to less-than-significant, would help improve overall transit access and operations in the Project vicinity.

Mitigation: None required.

Site Access Impact

Impact TR-8: The Project could conflict with adopted policies and standards regarding site access by automobiles, pedestrians and bicyclists. (Significant)

This impact examines whether the Project meets City policies and standards regarding site access by automobiles, pedestrians, and bicycles. Not meeting these standards could cause secondary impacts, including traffic congestion, and discouraging site employees from using alternative means of transportation to and from the Project site.

Automobile Access

In terms of external access, the Project conceptual plan shows four access driveways that the proposed Project would use. Two of these driveways access East Arques Avenue from the north edge of the site with full access, while the other two are right-in/right-out-only driveways accessing northbound North Wolfe Road. According to the Project site plan, the proposed site driveways have a width of 25 feet, which would be less than the minimum allowable driveway width for fire access in Sunnyvale (26 feet for buildings over 30 feet tall). Also, given the expected peak-hour volumes at these driveways, particularly outbound during the p.m. peak hour, both driveways should have dedicated lanes for both left and right turns. An exclusive northbound left-turn lane and an exclusive northbound right-turn lane at the two East Arques Avenue driveways would better accommodate the outbound Project trips during the p.m. peak hour. The current site plan, if unchanged, could result in increased congestion on the roadways adjacent to the Project site.

Pedestrian Access

In terms of pedestrian facilities, sidewalks are currently provided along the North Wolfe Road Project frontage. In addition, well-defined pathways would connect the proposed office buildings on site directly to North Wolfe Road and the intersection of North Wolfe Road and East Arques Avenue, where the closest bus stops are located. These internal pathways also connect to the south side of East Arques Avenue east of the Project site, where there is a lack of sidewalk that if provided could take pedestrians to the bus stops at the intersection of Commercial Street and East Arques Avenue. The internal site pathways also connect to a centralized pedestrian pathway system that is separated from vehicles and circulates between all buildings. An issue with the current design with regard to external pedestrian access includes a gap in sidewalk along eastbound East Arques Avenue between the existing and proposed pedestrian amenities at the Project site and the intersection of East Arques Avenue/Commercial Street. The internal pathway on the north side of the Project site would close part of the gap along East Arques Avenue between North Wolfe Road and Commercial Street.

These issues would restrict or inhibit pedestrian access to the site, and thereby decrease the likelihood that site employees would choose to walk to work. This could inhibit achievement of the five-percent TDM trip reduction goal and would be a significant impact.

Bicycle Access

Currently, there are Class II bicycle lanes along the North Wolfe Road Project frontage and west and east of the East Arques Avenue Project frontage. Based on the proposed Project site plan, primary bicycle access to the Project site would be provided at the proposed driveways and non-motorized pathways connecting to the intersection of East Arques Avenue/North Wolfe Road. These bicycle access points and pathways would connect to the Class II bicycle lanes along Wolfe Avenue, East Arques Avenue, and Commercial Street. However, the City's CBCIP calls for bikeways to be established on all City arterial and collector streets, and there is currently a gap in the eastbound bike lane on East Arques Avenue along the Project frontage.

There also is a gap in Class II bicycle lanes along the north-south DeGuigne Drive / Commercial Street bicycle corridor in the Project vicinity. The corridor extends from East Duane Avenue in the north to Kifer Road in the south; however, Commercial Street between Central Expressway and Kifer Road does not include bicycle facilities. Implementation of Mitigation Measure TR-1 (convert the Commercial Street / Central Expressway interchange to an at-grade signalized intersection) would afford an opportunity to close this gap while also enhancing local bicycle facility connectivity and access to the Lawrence Caltrain Station, and help meet City CBCIP and trip reduction goals.

The gaps in bicycle lanes described above would restrict or inhibit bicycles from accessing the Project site, and thereby decrease the likelihood that site employees would choose to bicycle to work. This could inhibit achievement of the five-percent TDM trip reduction goal and would be a significant impact.

Mitigation Measures

Mitigation Measure TR-8a: Design Changes to Improve Vehicle Access.

1. Widen driveway #4 to accommodate three lanes: one inbound and two outbound (one for left turns and one for right turns). This three-lane cross section shall be 36 feet wide to accommodate three 12-foot lanes and be extended for the entire 488-foot length shown in the site plan to accommodate maximum queues. The widened section can be achieved by increasing the pavement width in the direction of the easternmost property line shown in the site plan.

2. The same 36-foot cross section shall be provided at East Arques Avenue Driveway #3 between the Project's auto court and East Arques Avenue to accommodate maximum queues that may result from up to 25 outbound left turns and 50 outbound right turns during the p.m. peak hour. This 36-foot width shall also meet City fire access standards.

Mitigation Measure TR-8b: Design Changes to Improve Pedestrian Access. The Project applicant shall work with the City to provide new sidewalk to close the remaining gap between the east edge of the Project site and the East Arques Avenue / Commercial Street intersection. The resulting continuous sidewalk is expected to increase transit use to the Project site, as well as enhance existing Project pedestrian and bicycle access, thereby helping the Project meet City peak hour vehicle trip reduction goals.

Mitigation Measure TR-8c: Design Changes to Improve Bicycle Access.

1. To meet the City's CBCIP's requirement, the Project applicant shall work with the City to dedicate East Arques Avenue Project frontage to accommodate widening for a Class II bicycle lane to eliminate the existing bike lane gap in the eastbound direction. That improvement is expected to enhance existing Project bicycle access, as well as increase transit use to the Project site, thereby helping the Project meet City peak-hour vehicle trip reduction goals.

2. In conjunction with improvements to the Commercial Street-Central Expressway intersection (Mitigation Measure TR-1), the Project applicant shall work with the City to re-stripe Commercial Street between Central Expressway and Kifer Road to include Class II bicycle lanes in both directions. This can be accommodated within the existing 40-foot curb-to-curb width.

Significance after Mitigation: ***Less than Significant.*** Implementation of the above mitigation measures would ensure that Project impacts relative to site access would be reduced to less than significant.

Air Traffic Impacts

Impact TR-9: The Project would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks. (Less than Significant)

The Project site is located about 2.5 miles away from the Moffett Field Airport. Implementation of the Project would not result in a change in air traffic patterns (neither an increase in traffic

levels nor any building heights that would result in substantial safety risks). The Project impact on air traffic patterns would be less than significant.

Mitigation: None required.

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3.5 Air Quality

Introduction

This section addresses the impacts of the Project on ambient air quality and the exposure of people, especially sensitive individuals, to unhealthful pollutant concentrations. The analysis of Project-related emissions focuses on whether the Project would cause an exceedance of a State or national ambient air quality standard, a health based standard for exposure to toxic air contaminants, or a CEQA threshold considered by the Bay Area Air Quality Management District (BAAQMD).

Environmental Setting

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features that influence pollutant movement and dispersal. Atmospheric conditions such as wind speed, wind direction, atmospheric stability, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants, and consequently affect air quality.

Physical Setting

Climate and Meteorology

Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. The Project site is located in Santa Clara County and is within the boundaries of the San Francisco Bay Area Air Basin. The Bay Area Air Basin encompasses the nine-county region, including all of Alameda, Contra Costa, Santa Clara, San Francisco, San Mateo, Marin and Napa counties, and the southern portions of Solano and Sonoma counties. The climate of the Bay Area Air Basin is determined largely by a high-pressure system that is almost always present over the eastern Pacific Ocean off the West Coast of North America. During winter, the Pacific high-pressure system shifts southward, allowing more storms to pass through the region. During summer and early fall, when few storms pass through the region, emissions generated within the Bay Area can combine with abundant sunshine under the restraining influences of topography and subsidence inversions to create conditions that are conducive to the formation of photochemical pollutants, such as ozone, and secondary particulates, such as nitrates and sulfates.

More specifically, the Project site is located within the Santa Clara Valley climatological subregion of the Bay Area Air Basin, which is bounded by the Santa Cruz Mountains to the west, the Diablo Range (the Eastern Foothills) to the east, the San Francisco Bay to the north and the convergence of the Gabilan Range and the Diablo Range to the south. The wind patterns in the Valley are influenced greatly by the terrain, resulting in a prevailing flow roughly parallel to the Valley's northwest-southeast axis with a north-northwesterly sea breeze extending up the valley during the afternoon and early evening and a light south-southeasterly drainage flow occurring during the late evening and early morning.

At the northern end of the Santa Clara Valley, the San Jose Airport mean maximum temperatures range from the high 70's to the low 80's during the summer to the high 50's-low 60's during the winter, and mean minimum temperatures range from the high 50's during the summer to the low 40's during the winter. Further inland where the moderating effect of the Bay is not as strong, temperature extremes are even greater.

The Santa Clara Valley has a large population and the largest complex of mobile sources of pollution in the Bay Area Air Basin, making it a major source of carbon monoxide, particulate matter (PM) and photochemical air pollution. In addition, photochemical precursors from San Francisco, San Mateo and Alameda counties can be carried along by the prevailing winds to the Santa Clara Valley making it also a major ozone receptor (BAAQMD, 2013). The predominant wind direction in the area is out of the north northwest, as indicated by meteorological data recorded at Moffett Federal Airfield and compiled by the Western Regional Climate Center. The average annual wind speed is 6.0 miles per hour.

Existing Air Quality

The BAAQMD operates a regional monitoring network that measures the ambient concentrations of the six criteria air pollutants within the Bay Area. Existing levels of air quality in the vicinity of the Project site can generally be inferred from ambient air quality measurements conducted by the BAAQMD at its nearby monitoring stations. The station in Santa Clara County most representative of the Project site is the Jackson Street station in San Jose, which measures criteria pollutants, including ozone and fine particulate matter (PM_{10}, and $PM_{2.5}$). Although a closer monitoring station exists in Cupertino, this station is located near the Lehigh Permanente Quarry which is a localized source of particulate emissions that does not impact the area around the Project site. **Table 3.5-1** shows a three-year summary of monitoring data for ozone and particulates at the Jackson Street monitoring station. The table also compares these measured concentrations with State and federal ambient air quality standards (shown in parenthesis) with values in excess of standards indicated in bold.

Criteria Air Pollutants

Ozone (O_3). Short-term exposure to ozone can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NOx). ROG and NOx are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NOx under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone.

TABLE 3.5-1
AIR QUALITY DATA SUMMARY (2010-2012) – JACKSON STREET, SAN JOSE

Pollutant	Monitoring Data by Year		
	2010	**2011**	**2012**
Ozone			
Highest 1 Hour Average (ppm)[b]	**0.126**	0.098	0.101
Days over State Standard (0.09 ppm)[a,b]	**5**	**1**	**1**
Highest 8 Hour Average (ppm)[b]	**0.086**	0.067	0.062
Days over National Standard (0.075 ppm)[a]	**3**	0	0
Days over State Standard (0.07 ppm)[b]	**3**	0	0
Particulate Matter (PM_{10})			
Highest 24 Hour Average – State/National ($\mu g/m^3$)[b]	46.8/44.2	44.3/41.3	**59.6**/56.5
Estimated Days over National Standard (150 $\mu g/m^3$)[a,b,c]	0	0	0
Estimated Days over State Standard (50 $\mu g/m^3$)[a,b,c]	0	0	**1**
State Annual Average (State Standard 20 $\mu g/m^3$)[a,b]	19.5	19.2	18.8
Particulate Matter ($PM_{2.5}$)			
Highest 24 Hour Average ($\mu g/m^3$)[b] – National Measurement	**41.5**	**50.5**	**38.4**
Measured Days over National Standard (35 $\mu g/m^3$)[b,c]	**3**	**3**	**2**
State Annual Average (12 $\mu g/m^3$)[b]	9	9.9	ND

[a] Generally, state standards and national standards are not to be exceeded more than once per year. Consequently, one exceedance of a standard is not necessarily related to a violation of the standard.
[b] ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter.
[c] PM_{10} and $PM_{2.5}$ are not measured every day of the year. Number of estimated days over the standard is based on 365 days per year.

NA = Not Available. Values in **Bold** exceed the respective air quality standard.

SOURCE: California Air Resources Board (CARB), 2013.

Carbon Monoxide (CO). Ambient CO concentrations normally are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. Wind speed and atmospheric mixing also influence CO concentrations. Under inversion conditions, CO concentrations may be distributed more uniformly over an area that may extend some distance from vehicular sources. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia, as well as for fetuses.

CO concentrations have declined dramatically in California due to regulatory controls and programs. Most areas of the state, including the region encompassing the Project site, have no problem meeting the State and federal CO standards. CO measurements and modeling were important in the early 1980s when CO levels were regularly exceeded throughout California. In more recent years, CO measurements and modeling have not been a priority in most California air districts due to the retirement of older polluting vehicles, lower emissions from new vehicles, and improvements in fuels. The clear success in reducing CO levels is evident in the first paragraph of the executive summary of the CARB *2004 Revision to the California State Implementation Plan*

for Carbon Monoxide Updated Maintenance Plan for Ten Federal Planning Areas (CARB, 2004), shown below:

> "The dramatic reduction in carbon monoxide (CO) levels across California is one of the biggest success stories in air pollution control. Air Resources Board (CARB or Board) requirements for cleaner vehicles, equipment and fuels have cut peak CO levels in half since 1980, despite growth. All areas of the state designated as non-attainment for the federal 8-hour CO standard in 1991 now attain the standard, including the Los Angeles urbanized area. Even the Calexico area of Imperial County on the congested Mexican border had no violations of the federal CO standard in 2003. Only the South Coast and Calexico continue to violate the more protective State 8-hour CO standard, with declining levels beginning to approach that standard."

Nitrogen Dioxide (NO_2). NO_2 is a reddish brown gas that is a by-product of combustion processes. Automobiles and industrial operations are the main sources of NO_2. NO_2 may be visible as a coloring component of a brown cloud on high pollution days, especially in conjunction with high ozone levels. Nitrogen dioxide is an air quality concern because it acts as a respiratory irritant and is a precursor of ozone. Nitrogen dioxide is a major component of the group of gaseous nitrogen compounds commonly referred to as nitrogen oxides (NOx) which also includes nitric oxide (NO). Nitrogen oxides are produced by fuel combustion in motor vehicles, industrial stationary sources (such as refineries and cement kilns), ships, aircraft, and rail transit. Typically, NOx emitted from fuel combustion is in the form of NO and NO_2. NO is often converted to NO_2 when it reacts with ozone or undergoes photochemical reactions in the atmosphere. Therefore, emissions of NO_2 from combustion sources are typically evaluated based on the amount of NOx emitted from the source.

Sulfur Dioxide (SO_2). SO_2 is a combustion product of sulfur or sulfur-containing fuels such as coal and diesel. SO_2 is also a precursor to the formation of atmospheric sulfate and particulate matter, and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain.

Particulate Matter. PM_{10} and $PM_{2.5}$ consist of particulate matter that is 10 microns or less in diameter and 2.5 microns[1] or less in diameter, respectively. PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Some sources of particulate matter, such as wood burning in fireplaces, demolition, and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility. Large dust particles (diameter greater than 10 microns) settle out rapidly and are easily filtered by human breathing passages. This large dust is of more concern as a soiling nuisance rather than a health hazard. The remaining fraction, PM_{10} and $PM_{2.5}$, are a health concern particularly at levels above the federal and State ambient air quality standards. $PM_{2.5}$ (including diesel exhaust particles) is thought to have greater effects on health because these particles are so small and thus are able to penetrate to the

[1] A micron is one-millionth of a meter

deepest parts of the lungs. Scientific studies have suggested links between fine particulate matter and numerous health problems including asthma, bronchitis, and acute and chronic respiratory symptoms such as shortness of breath and painful breathing. Recent studies have shown an association between morbidity and mortality and daily concentrations of particulate matter in the air. Children are more susceptible to the health risks of PM_{10} and $PM_{2.5}$ because their immune and respiratory systems are still developing.

Mortality studies since the 1990s have shown a statistically significant direct association between mortality (premature deaths) and daily concentrations of particulate matter in the air. Despite important gaps in scientific knowledge and continued reasons for some skepticism, a comprehensive evaluation of the research findings provides persuasive evidence that exposure to fine particulate air pollution has adverse effects on cardiopulmonary health (Dockery and Pope, 2006).

Lead. Ambient lead concentrations meet both the federal and State standards in the Bay Area Air Basin. Lead has a range of adverse neurotoxin health effects, and was formerly released into the atmosphere primarily via leaded gasoline products. The phase-out of leaded gasoline in California resulted in decreasing levels of atmospheric lead. The Project would not introduce any new sources of lead emissions; consequently, lead emissions are not required to be quantified and are not further evaluated in this analysis.

Toxic Air Contaminants

The ambient background of toxic air contaminants (TACs) is the combined result of many diverse human activities, including gasoline stations, automobiles, dry cleaners, industrial operations, hospital sterilizers, and painting operations. In general, mobile sources contribute more significantly to health risks than do stationary sources. Both BAAQMD and the California Air Resources Board (CARB) operate a network of monitoring stations that measure ambient concentrations of certain TACs that are associated with strong health-related effects and are present in appreciable concentrations in the Bay Area, as in all urban areas. Ambient concentrations of TACs are similar throughout the urbanized areas of the Bay Area.

Growing evidence indicates that exposure to emissions from diesel-fueled engines, about 95% of which come from diesel-fueled mobile sources, may result in cancer risks that exceed those attributed to other measured TACs. In 1998, the Office of Environmental Health Hazard Assessment (OEHHA) issued a health risk assessment that included estimates of the cancer potency of diesel particulate matter (DPM) (OEHHA, 2009). Because DPM cannot be directly monitored in the ambient air, however, estimates of cancer risk resulting from diesel PM exposure must be based on concentration estimates made using indirect methods (e.g., derivation from ambient measurements of a surrogate compound).

Asbestos is also a TAC of concern, particularly in association with demolition of older buildings and structures. Asbestos is a fibrous mineral, which is both naturally occurring in ultramafic rock (a rock type commonly found in California) and used as a processed component of building materials. Because asbestos has been proven to cause serious adverse health effects, including

asbestosis and lung cancer, it is strictly regulated based on its natural widespread occurrence and its former use as a building material.

Sensitive Land Uses

Some persons are considered more sensitive than others to air pollutants. The reasons for heightened sensitivity may include age, health problems, proximity to the emissions source, and duration of exposure to air pollutants. Land uses such as schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because the very young, the old, and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people are often at home for extended periods. Recreational land uses are moderately sensitive to air pollution, because vigorous exercise associated with recreation places a high demand on the human respiratory system.

The Project site is located in a commercial/industrial area. The closest existing residences are located approximately 575 feet northwest of the Project site. An approved but uncompleted potentially sensitive land use is located across North Wolfe Road, where the existing Chung Tai Zen Center of Sunnyvale plans to expand to include eight residences for monks. The existing Zen Center is located about 350 feet west of the Project site and represents the nearest sensitive receptor. The new residences would be located in an adjacent building that is about 150 feet from the Project site, immediately across North Wolfe Road. Other land uses in the area are commercial and industrial, and would not be considered sensitive receptors.

Regulatory Framework

Regulatory Setting for Criteria Pollutants

The United States Environmental Protection Agency (U.S. EPA) is responsible for implementing the programs established under the federal Clean Air Act, such as establishing and reviewing the federal ambient air quality standards and judging the adequacy of State Implementation Plans (SIPs). However, the U.S. EPA has delegated the authority to implement many of the federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented. In California, CARB is responsible for establishing and reviewing the State ambient air quality standards, developing and managing the California SIP, securing approval of this plan from U.S. EPA, identifying TACs, regulating mobile emissions sources in California, and overseeing the activities of air quality management districts, which are organized at the county or regional level. Air quality management districts, such as the BAAQMD, are primarily responsible for regulating stationary emissions sources at facilities within their geographic areas and for preparing the air quality plans that are required under the federal and State Clean Air Acts.

Federal

The Federal Clean Air Act requires the U.S. EPA to identify National Ambient Air Quality Standards (NAAQS or “national standards”) to protect public health and welfare. National standards have been established for O_3, CO, NO_2, sulfur dioxide, respirable particulate matter

(PM_{10} and $PM_{2.5}$), and lead. **Table 3.5-2** shows current national and State ambient air quality standards, as well as the Bay Area attainment status and common sources for each pollutant.

TABLE 3.5-2
AMBIENT AIR QUALITY STANDARDS AND BAY AREA ATTAINMENT STATUS

Pollutant	Averaging Time	State Standard	Bay Area Attainment Status for California Standard	Federal Primary Standard	Bay Area Attainment Status for Federal Standard	Major Pollutant Sources
Ozone	8 hour	0.070 ppm	Non-Attainment	0.075 ppm	Non-Attainment	Formed when ROG and NOx react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial/ industrial mobile equipment.
	1 hour	0.090 ppm	Non-Attainment	---	---	
Carbon Monoxide	8 hour	9.0 ppm	Attainment	9.0 ppm	Attainment	Internal combustion engines, primarily gasoline-powered motor vehicles
	1 Hour	20 ppm	Attainment	35 ppm	Attainment	
Nitrogen Dioxide	Annual Average	0.030 ppm	---	0.053 ppm	Attainment	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads
	1 Hour	0.180 ppm	Attainment	0.100 ppm	Unclassified	
Sulfur Dioxide	Annual Average	---	---	0.03 ppm	Attainment	Fuel combustion, chemical plants, sulfur recovery plants and metal processing
	24 Hour	0.04 ppm	Attainment	0.14 ppm	Attainment	
	1 Hour	0.25 ppm	Attainment	0.075 ppm	Attainment	
Particulate Matter (PM10)	Annual Arithmetic Mean	20 μg/m3	Non-Attainment	---	---	Dust- and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays)
	24 hour	50 μg/m3	Non-Attainment	150 μg/m3	Unclassified	
Particulate Matter (PM2.5)	Annual Arithmetic Mean	12 μg/m3	Non-Attainment	15 μg/m3	Attainment	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.
	24 hour	---	---	35 μg/m3	Non-Attainment	
Lead	Calendar Quarter	---	---	1.5 μg/m3	Attainment	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	30 Day Average	1.5 μg/m3	Attainment	---	---	
Hydrogen Sulfide	1 hour	0.03 ppm	Unclassified	No Federal Standard	---	Geothermal Power Plants, Petroleum Production and refining

SOURCE: BAAQMD, 2012b.

Pursuant to the 1990 Federal Clean Air Act amendments, the U.S. EPA classifies air basins (or portions thereof) as “attainment” or “nonattainment” for each criteria air pollutant, based on whether or not the national standards have been achieved. Table 3.5-2 shows the current attainment status for the State and the Bay Area Air Basin.

The Federal Clean Air Act requires each state to prepare an air quality control plan referred to as the SIP. The Federal Clean Air Act amendments added requirements for states containing areas that violate the national standards to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is a living document that is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The U.S. EPA has responsibility to review all SIPs to determine if they conform to the mandates of the Federal Clean Air Act amendments and will achieve air quality goals when implemented. If the U.S. EPA determines a SIP to be inadequate, it may prepare a Federal Implementation Plan (FIP) for the nonattainment area and may impose additional control measures. Failure to submit an approvable SIP or to implement the plan within mandated timeframes can result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

Regulation of TACs, termed Hazardous Air Pollutants (HAPs) under federal regulations, is achieved through federal, state and local controls on individual sources. The 1977 Federal Clean Air Act amendments required the U.S. EPA to identify National Emission Standards for HAPs to protect public health and welfare. These substances include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals.

State

CARB manages air quality, regulates mobile emissions sources, and oversees the activities of county Air Pollution Control Districts and regional Air Quality Management Districts. CARB establishes State ambient air quality standards and vehicle emissions standards. California has adopted ambient standards that are more stringent than the federal standards for the criteria air pollutants. California has air quality standards for some pollutants for which there is no corresponding national standard. These are shown in Table 3.5-2. Under the California Clean Air Act (which is patterned after the Federal Clean Air Act), areas have been designated as attainment or nonattainment with respect to the State standards. Table 3.5-2 summarizes the Bay Area’s attainment status with regard to California standards.

The Health and Safety Code defines TACs as air pollutants which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health. The State Air Toxics Program was established in 1983 under Assembly Bill (AB) 1807 (Tanner). A total of 243 substances have been designated TACs under California law; they include the 189 (federal) Hazardous Air Pollutants adopted in accordance with AB 2728. The Air Toxics “Hot Spots” Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources; however, AB 2588 does not regulate air toxics emissions. Toxic air contaminant emissions from individual facilities are quantified and prioritized. “High-

priority" facilities are required to perform a health risk assessment and, if specific thresholds are violated, are required to communicate the results to the public in the form of notices and public meetings.

In August of 1998, CARB identified diesel particulate matter (DPM) as a TAC. CARB subsequently developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (CARB, 2000). The document contains proposals to reduce diesel particulate emissions, with the goal of reducing emissions and associated health risks by 75% by 2010 and by 85% by 2020. The program aims to require the use of state-of-the-art catalyzed diesel particulate filters and ultra low sulfur diesel fuel on diesel-fueled engines.

In April 2005, CARB published *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB, 2005). This handbook is intended to give guidance to local governments in the siting of sensitive land uses, such as residences, schools, daycare centers, playgrounds, or medical facilities, near sources of air pollution. In the vicinity of the Project site, there are several TAC sources. Most of these are associated with commercial uses, including gasoline dispensing facilities and dry cleaning operations.

Regional

Air Quality Plans

The 1977 Federal Clean Air Act amendments require that regional planning and air pollution control agencies prepare a regional Air Quality Plan to outline the measures by which both stationary and mobile sources of pollutants can be controlled in order to achieve all standards specified in the Clean Air Act. The 1988 California Clean Air Act also requires development of air quality plans and strategies to meet State air quality standards in areas designated as non-attainment (with the exception of areas designated as non-attainment for the State PM standards). Maintenance plans are required for attainment areas that had previously been designated non-attainment in order to ensure continued attainment of the standards. Air quality plans developed to meet federal requirements are referred to as SIPs, discussed above.

Bay Area plans are prepared with the cooperation of the BAAQMD, Metropolitan Transportation Commission (MTC), and the Association of Bay Area Governments (ABAG). On September 15, 2010, the BAAQMD adopted the most recent revision to the Clean Air Plan - the *Bay Area 2010 Clean Air Plan* (BAAQMD, 2010). The *Bay Area 2010 Clean Air Plan* serves to:

- Update the *Bay Area 2005 Ozone Strategy* in accordance with the requirements of the California Clean Air Act to implement "all feasible measures" to reduce ozone;
- Consider the impacts of ozone control measures on particulate matter, air toxics, and greenhouse gases in a single, integrated plan;
- Review progress in improving air quality in recent years; and
- Establish emission control measures to be adopted or implemented in the 2010 – 2012 timeframe.

BAAQMD Rules, Regulations, and CEQA Guidelines

The BAAQMD is the regional agency responsible for rulemaking, permitting, and enforcement activities affecting stationary sources in the Bay Area. BAAQMD does not have authority to regulate emissions from motor vehicles. Specific rules and regulations adopted by the BAAQMD limit the emissions that can be generated by various stationary sources, and identify specific pollution reduction measures that must be implemented in association with various activities. These rules regulate not only emissions of the six criteria air pollutants, but also TACs Emissions sources subject to these rules are regulated through the BAAQMD's permitting process and standards of operation. Through this permitting process, including an annual permit review, the BAAQMD monitors generation of stationary emissions and uses this information in developing its air quality plans. Any sources of stationary emissions constructed as part of the Project would be subject to the BAAQMD Rules and Regulations. Both federal and State ozone plans rely heavily upon stationary source control measures set forth in BAAQMD's Rules and Regulations.

With respect to construction activities associated with Project development, applicable BAAQMD regulations would relate to portable equipment (e.g., concrete batch plants, and gasoline- or diesel-powered engines used for power generation, pumps, compressors, pile drivers, and cranes), architectural coatings, and paving materials. Equipment used during Project construction would be subject to the requirements of BAAQMD Regulation 2 (Permits), Rule 1 (General Requirements) with respect to portable equipment unless exempt under Rule 2-1-105 (Exemption, Registered Statewide Portable Equipment); BAAQMD Regulation 8 (Organic Compounds), Rule 3 (Architectural Coatings); and BAAQMD Regulation 8 (Organic Compounds), Rule 15 (Emulsified and Liquid Asphalts). In addition, the BAAQMD regulates the demolition of buildings or structures that may contain asbestos through Regulation 11 (Hazardous Pollutants) Rule 2 (Asbestos Demolition, Renovation, and Manufacturing).

BAAQMD adopted updated *CEQA Air Quality Guidelines*, including new thresholds of significance in June 2010, and revised them in May 2011 (BAAQMD, 2012a). The Air Quality Guidelines advise lead agencies on how to evaluate potential air quality impacts, including establishing quantitative and qualitative thresholds of significance. The thresholds BAAQMD adopted were called into question by a minute order issued January 9, 2012 in *California Building Industry Association v. BAAQMD,* Alameda Superior Court Case No. RGI0548693. The minute order states that "The Court finds [BAAQMD's adoption of thresholds] is a CEQA Project, the court makes no further findings or rulings." The claims made in the case concerned the CEQA impacts of adopting the thresholds, particularly, how the thresholds would affect land use development patterns. Petitioners argued that the thresholds for Health Risk Assessments encompassed issues not addressed by CEQA. As a result, the BAAQMD resolutions adopting and revising the significance thresholds in 2011 were set aside by a judicial writ of mandate on March 5, 2012. In May of 2012, BAAQMD updated its CEQA Air Quality Guidelines to continue to provide direction on recommended analysis methodologies, but without recommended quantitative significance thresholds. On August 13, 2013, the First District Court of Appeal ordered the trial court to reverse the judgment and upheld the BAAQMD's CEQA thresholds. *California Building Industry Ass'n v. Bay Area Air Quality Mgmt. Dist*., Case No. A135335 &

A136212 (Court of Appeal, First District, August 13, 2013). BAAQMD has not formally re-instated the thresholds or otherwise responded to this Appellate Court reversal at this time.

The air quality impact analysis in this EIR uses the previously-adopted thresholds and methodologies from the 2011 BAAQMD *CEQA Air Quality Guidelines* to determine the potential impacts of the Project. While the significance thresholds adopted by BAAQMD in 2011 are not currently recommended by the BAAQMD, these thresholds are based on substantial evidence identified in BAAQMD's 2009 *Justification Report* (BAAQMD, 2009) and are therefore used within this document.

Local

Chapter 7 (Environmental Management), of the City of Sunnyvale General Plan (City of Sunnyvale, 2011) includes the following goals and policies that are relevant to air quality in Sunnyvale:

- **Goal EM-11: Improved Air Quality.** Improve Sunnyvale's air quality and reduce the exposure of its citizens to air pollutants.
  - ***Policy EM-11.1*:** The City should actively participate in regional air quality planning.
  - ***Policy EM-11.2*:** Utilize land use strategies to reduce air quality impact, including opportunities for citizens to live and work in close proximity.
  - ***Policy EM-11.3*:** Require all new development to utilize site planning to protect citizens from unnecessary exposure to air pollutants.
  - ***Policy EM-11.4*:** Apply the indirect source rule to new development with significant air quality impacts. Indirect source review would cover commercial and residential projects as well as other land uses that produce or attract motor vehicle traffic.
  - ***Policy EM-11.5*:** Reduce automobile emissions through traffic and transportation improvements.
  - ***Policy EM-11.6*:** Contribute to a reduction in regional vehicle miles travelled.
  - ***Policy EM-11.7*:** Reduce emissions from City of Sunnyvale fleet vehicles.
  - ***Policy EM-11.8*:** Assist employers in meeting requirements of transportation demand management (TDM) plans for existing and future large employers and participate in the development of TDM plans for employment centers in Sunnyvale.

Impacts and Mitigation Measures

This analysis evaluates the Project's impacts related to air quality. The evaluation considered Project plans, current CEQA *Guidelines* Appendix G significance thresholds, conditions at the Project site, and applicable regulations. Potential impacts from greenhouse gas emissions on climate change are evaluated in Section 3.6, *Climate Change and Greenhouse Gas Emissions*.

Significance Criteria

Consistent with Appendix G of the State CEQA *Guidelines*, the impact of the Project on air quality would be considered significant if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or Projected air quality violation;
- Result in a cumulatively significant net increase of any nonattainment pollutant;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

The following Appendix G criterion is not considered relevant to the Project based upon the Project plans and data research; therefore, it will not be evaluated further in this EIR:

> **Creation of objectionable odors.** The Project would not involve the development of the types of land uses typically associated with odor issues, such as wastewater treatment plants, landfills, composting facilities, refineries, or chemical plants. Nor would the Project locate sensitive receptors within proximity of these types of odor-producing sources. Therefore, the following analysis relates to the Project's potential to result in a significant air quality impact based on the other four significance criteria.

Approach to Analysis

Potential impacts are assessed by modeling the estimated daily emissions generated by Project construction and Project operations using the CalEEMod land use emissions model version 2013.2. Project emissions are then compared to the significance criteria in the BAAQMD 2011 *CEQA Air Quality Guidelines*, which include the following:

- Result in total construction emissions of ROG, NOx, or $PM_{2.5}$ (exhaust) of 10 tons per year or greater or 54 pounds per day or greater.
- Exceed a construction emission threshold for PM_{10} (exhaust) of 15 tons per year or greater, or 82 pounds per day or greater.
- For PM_{10} and $PM_{2.5}$ as part of fugitive dust generated during construction, the BAAQMD Guidelines specify compliance with Best Management Practices as the threshold.
- Result in total operational emissions of ROG, NOx, or $PM_{2.5}$ of 10 tons per year or greater, or 54 pounds per day or greater.
- Exceed an operational emission threshold for PM_{10} of 15 tons per year or greater, or 82 pounds per day.
- Result in CO concentrations of 9.0 ppm (8-hour average) and 20.0 ppm (1-hour average) as estimated by roadway vehicle volumes exceeding 44,000 vehicles per hour at any intersection.

A project's contribution to cumulative impacts for criteria pollutants is considered significant if the project's impact individually would be significant (i.e., if it exceeds the BAAQMD's quantitative thresholds).

Impact Analysis

Impact AIR-1: Project construction would result in increased emissions of criteria air pollutants. (Significant)

Construction of the Project would result in emissions of criteria pollutants from the use of heavy-duty construction equipment, haul truck trips, and vehicle trips generated from construction workers traveling to and from the site. In addition, fugitive dust or PM_{10} emissions would result from excavation, trenching, and other construction activities.

Construction-related emissions from the Project were calculated using the California Emissions Estimator Model (CalEEMod), assuming 518,890 square feet of office park, and a total of 847,650 square feet of enclosed parking, over an approximately 17.6 acre site. Demolition of the existing 258,000 square foot structure was assumed to occur over a two month period. Construction was assumed to occur over approximately a 22-month period beginning in 2014. The conceptual grading plan estimates 50,500 cubic yards of total earthwork, with 22,500 cubic yards of export. Off-haul of this material was accounted for in the CalEEMod model run, consistent with the Project description. Construction activities were divided into four phases: demolition, grading, building construction, and architectural coating. All model inputs and outputs are provided in Appendix D.

As can be seen in **Table 3.5-3**, estimated peak-day construction-related exhaust emissions could exceed the thresholds for NOx during 2014 and ROG during 2015. NOx emissions would be predominantly from exhaust from diesel-powered construction equipment. ROG emissions would be predominantly from application of paint and other architectural coatings in the modeling results for 2015. Because estimated emissions are in excess of the daily thresholds for NOx and ROG, this impact is significant.

TABLE 3.5-3
PEAK DAY CONSTRUCTION-RELATED POLLUTANT EMISSIONS
(pounds per day) WITHOUT MITIGATION

Year	ROG	NO_x	Exhaust PM_{10}	Exhaust $PM_{2.5}$
2014	17.2	**73.7**	3.1	2.9
2015	**63.0**	38.2	1.7	1.6
BAAQMD Considered Construction Threshold	54	54	82	54
Potential Significant Impact?	Yes	Yes	No	No

Note: **Bolded** figures indicate values exceed significance threshold.

SOURCE: ESA (Appendix D)

The BAAQMD's approach to analysis of construction-related particulate impacts (other than exhaust PM) is to emphasize implementation of effective and comprehensive dust control measures rather than detailed quantification of emissions. The BAAQMD considers construction-related fugitive dust impacts of projects to be less than significant if a suite of recommended dust-control measures are implemented. Therefore, BAAQMD-identified Best Management Practices for control of fugitive dust are included as a mitigation measure.

Mitigation Measures

Mitigation Measure AIR-1a: Off-Road Equipment Control Measures. All off-road equipment greater than 25 hp and operating for more than 20 total hours over the duration of construction activities shall meet the following requirements:

a. Where access to alternative sources of power are available, portable diesel generators shall be prohibited;

b. All off-road equipment shall have:

   i. Engines that meet or exceed either U.S. EPA Tier 3 off-road emission standards, or

   ii. Engines that are retrofitted with an ARB Level 3 Verified Diesel Emissions Control Strategy (VDECS).

Mitigation Measure AIR-1b: Architectural Coatings. ROG emissions from the use of architectural coatings shall be reduced by implementing either or both of the following measures:

i. Architectural coatings shall be applied over the course of 4 months or longer, in order to reduce daily ROG emissions to below the significance threshold.

ii. A minimum of 67%of exterior building materials shall be prefinished to reduce ROG emissions as a condition of the building permit.

Mitigation Measure AIR-1c: Best Management Practices for Controlling Particulate Emissions. The following BAAQMD Best Management Practices for particulate control will be required for all construction activities within the Project site. These measures will reduce particulate emissions primarily during soil movement, grading and demolition activities by also during vehicle and equipment movement on unpaved project sites

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

3. 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.

4. All vehicle speeds on unpaved roads shall be limited to 15 mph.

5. 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.

6. 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, § 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

Significance after Mitigation: *Less than Significant.* Table 3.5-4 shows construction-related emissions after application of Mitigation Measure AIR-1a and AIR-1b. As shown in the table, Mitigation Measure AIR-1a would reduce NOx emissions to below the threshold level, and Mitigation Measure AIR-1b would reduce ROG emissions below the threshold. Additionally, Best Management Practices for control of fugitive dust are identified in Mitigation Measure AIR-1c to reduce to the extent feasible emissions of construction-related dust. Table 3.5-4 below shows data for emissions after mitigation measures are applied. As shown in the table, with mitigation, emissions would be reduced to below the significance thresholds, and the impact would be less than significant.

TABLE 3.5-4
PEAK DAY CONSTRUCTION-RELATED POLLUTANT EMISSIONS
(pounds per day) WITH MITIGATION

Year	ROG	NO_x	Exhaust PM_{10}[a]	Exhaust $PM_{2.5}$[a]
2014	14.1	49.5	1.6	1.5
2015	51.3[b]	27.7	1.0	0.9
BAAQMD Considered Construction Threshold	54	54	82	54
Significant Impact?	No	No	No	No

[a] BAAQMD's construction-related significance thresholds developed for PM_{10} and $PM_{2.5}$ apply to exhaust emissions only and not to fugitive dust.
[b] Assumes 67% of exterior building materials are prefinished.

SOURCE: ESA (Appendix D), SCAQMD, 2013

Impact AIR-2: Construction of the Project would increase emission of toxic air contaminants (TACs), and increase health risks for nearby residents. (Less than Significant)

As discussed in the Environmental Setting section, above, the only sensitive receptors within 1,000 feet of the Project boundaries are the Parkside Apartment Homes, approximately 575 feet northwest of the proposed Building 1, and the Chung Tai Zen Center of Sunnyvale, about 350 feet west of Project site. Planned new residences for monks at the Zen Center would be in an adjacent building about 150 feet from the Project site. Because the predominant wind direction at the site is from the north-northwest, these residences are generally upwind of the Project site. While diesel-powered construction equipment would generate diesel particulate matter, which has

been identified by the State of California as a TAC, the distance and upwind location of the sensitive receptors in the area would result in low concentrations of DPM and $PM_{2.5}$ concentrations at these locations. Furthermore, construction-related $PM_{2.5}$ exhaust emissions, as presented in Table 3.5-3, which would represent the daily emissions of both DPM and $PM_{2.5}$, total approximately 5% of the threshold for $PM_{2.5}$, indicating a relatively modest emission rate. Moreover, the construction period is relatively short (estimated to be 22 months; most of the heavy equipment use would be during the first year), which would limit long-term (i.e., cancer) health risks, which are a function of pollutant concentration and duration of exposure. Consequently the Project would be expected to have a less-than-significant impact with regard to exposing sensitive receptors to increased health risk.

Mitigation: None required.

Impact AIR-3: Operation of the Project would result in increased emissions of criteria air pollutants. (Significant)

Operational emissions of criteria pollutants were estimated using the CalEEMod version 2013.2.2 emissions inventory model (**Table 3.5-5**). All model inputs and outputs are provided in Appendix D.

TABLE 3.5-5
UNMITIGATED OPERATIONAL CRITERIA POLLUTANT EMISSIONS

Air Pollutant	Estimated Emissions (lbs/day)			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Mobile Sources[a]	11.55	25.23	16.54	4.61
Area Sources[a]	24.42	0.00	0.00	0.00
Natural gas combustion[a]	0.34	3.10	0.24	0.24
Back-up Diesel Generator	0.95	32.16	0.94	0.94
Total	**37.26**	**60.49**	**17.72**	**5.79**
Regional Significance Threshold	54	54	82	54
Significant Impact?	No	Yes	No	No

[a] Mobile sources are motor vehicles and trucks. Area sources include landscape maintenance (equipment used for these activities such as gasoline-powered lawnmowers and blowers), maintenance application of paints and other interior and exterior surface coatings, and increased use of consumer products that result in emissions of ROG. Natural gas combustion is for space and water heating.

SOURCE: ESA (see Appendix D).

One of the major sources of operational emissions would be vehicle emissions from employees commuting to and from the site, deliveries, etc. Traffic volumes used to estimate vehicle-related emissions were derived from the traffic study prepared for the Project (TJKM, 2013). Project operations would generate an estimated 3,023 daily vehicle trips, as described in Section 3.4. *Traffic and Circulation*. In addition to exhaust emissions, vehicles would also generate PM_{10} and $PM_{2.5}$ from entrained road dust and tire and brake wear.

Emissions would also be generated by on-site natural gas combustion, operation of landscape maintenance equipment, maintenance application of paint and other architectural coatings, and testing and operation of an emergency diesel-powered generator.

As shown in Table 3.5-5, without mitigation, operational emissions of NOx would exceed the significance thresholds for these pollutants. Emissions of ROG, PM_{10} and $PM_{2.5}$ would be below threshold levels. Because operational emissions of NOx would be above threshold levels, this impact would be significant.

Mitigation Measures

Mitigation Measure AIR-3: Low Emission Backup Diesel Generator. The engine for the proposed back-up diesel generator shall meet U.S. EPA Tier Level 3 emission requirements.

Significance after Mitigation: ***Less than Significant.*** As indicated in **Table 3.5-6**, the mitigation measures specified above would reduce, operational emissions of NOx to below the significance threshold. The operational air quality impact would therefore be less than significant with mitigation.

TABLE 3.5-6
MITIGATED OPERATIONAL CRITERIA POLLUTANT EMISSIONS

Air Pollutant	Estimated Emissions (lbs/day)			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Mobile Sources[a]	11.55	25.23	16.54	4.61
Area Sources[a]	22.81	0.00	0.00	0.00
Natural gas combustion[a]	0.31	2.79	0.21	0.21
Back-up Diesel Generator	0.59	9.73	0.94	0.94
Total	**35.26**	**37.75**	**17.69**	**5.76**
Regional Significance Threshold	54	54	82	54
Significant Impact?	No	No	No	No

[a] Mobile sources are motor vehicles and trucks. Area sources include landscape maintenance (equipment used for these activities such as gasoline-powered lawnmowers and blowers), maintenance application of paints and other interior and exterior surface coatings, and increased use of consumer products that result in emissions of ROG. Natural gas combustion is for space and water heating.

SOURCE: ESA (see Appendix D).

Impact AIR-4: Project operations would increase emission of toxic air contaminants, and increase health risks for nearby residents. (Less than Significant)

The only source of TACs associated with Project operations would be diesel particulate matter from a one MW diesel backup generator, of approximately 1,340 HP, which would be located on the sixth floor of the parking garage, south of the cooling towers. However, the nearest sensitive receptors, future residential units located at the Chung Tai Zen Center of Sunnyvale, are located

about 650 feet away from the proposed site of the parking garage. Future residents of the Zen Center would be subject to relatively minimal health risk from the generator's diesel emissions, based on BAAQMD's Distance Adjustment Multiplier for diesel engine exhaust, which indicates that the risk at 650 feet would be more than 90% less than the risk at the generator location. (BAAQMD, 2012a). Moreover, the BAAQMD will not issue a permit for a new generator that results in an operational cancer risk greater than 10 in one million, the CEQA threshold of significance. Finally, Mitigation Measure AIR-3, which requires use of a low-emissions generator, would further reduce exposure of nearby sensitive receptors to TAC emissions. Therefore, the impact would be less than significant and no mitigation would be required.

Mitigation: None required.

Impact AIR-5: The Project could conflict with or obstruct implementation of the applicable air quality plan. (Less than Significant)

The most recently adopted air quality plan in the San Francisco Bay Area Air Basin is the BAAQMD's 2010 Clean Air Plan (2010 CAP) (BAAQMD, 2010). The 2010 CAP is a roadmap showing how the San Francisco Bay Area will achieve compliance with the State one-hour ozone standard as expeditiously as practicable, and how the region will reduce transport of ozone and ozone precursors to neighboring air basins. The control strategy includes stationary source control measures to be implemented through BAAQMD regulations; mobile source control measures to be implemented through incentive programs and other activities; and transportation control measures to be implemented through transportation programs in cooperation with the MTC, local governments, transit agencies, and others. The 2010 CAP also represents the Bay Area's most recent triennial assessment of the region's strategy to attain the State one-hour ozone standard.

BAAQMD guidance states that "if approval of a project would not result in significant and unavoidable air quality impacts, after the application of all feasible mitigation, the project would be considered consistent with the 2010 CAP." As indicated in the discussion of the previous impacts, the Project would result in significant and unavoidable air quality impacts. As discussed in **Impact AIR-4**, the proposed Project would have a less than significant operational impact on air quality after implementation of feasible mitigation measures. Consequently, based on BAAQMD guidance, the Project may also be considered consistent with the 2010 CAP (the applicable air quality plan). This would be a less-than-significant impact.

Mitigation: None required.

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3.6 Climate Change and Greenhouse Gas Emissions

Introduction

This section presents an overview of global and local climate change, and examines the potential for the Project to result in increased greenhouse gas (GHG) emissions, which contribute to climate change. The impact analysis also includes an evaluation of the consistency of the Project with statewide and local planning efforts to reduce GHG emissions.

Environmental Setting

"Global warming" and "global climate change" are the terms used to describe the increase in the average temperature of the earth's near-surface air and oceans since the mid-20th century and its projected continuation. Warming of the climate system is now considered to be unequivocal (IPCC, 2007), with global surface temperature increasing approximately 1.33 degrees Fahrenheit (°F) over the last 100 years. Continued warming is projected to increase global average temperature between 2 and 11°F over the next 100 years.

Natural processes and human actions have been identified as the causes of this warming. The International Panel on Climate Change (IPCC) concludes that variations in natural phenomena such as solar radiation and volcanoes produced most of the warming from pre-industrial times to 1950 and had a small cooling effect afterward. After 1950, however, increasing GHG concentrations resulting from human activity such as fossil fuel burning and deforestation have been responsible for most of the observed temperature increase. These basic conclusions have been endorsed by more than 45 scientific societies and academies of science, including all of the national academies of science of the major industrialized countries. Since 2007, no scientific body of national or international standing has maintained a dissenting opinion.

Increases in GHG concentrations in the earth's atmosphere are the main cause of human-induced climate change. GHGs naturally trap heat by impeding the exit of solar radiation that has reached the earth. Some GHGs occur naturally and are necessary for keeping the earth's surface inhabitable. However, increases in the concentrations of these gases in the atmosphere during the last 100 years have decreased the amount of solar radiation that is reflected back into space, intensifying the natural greenhouse effect and resulting in the increase of global average temperature.

Greenhouse Gases

Carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are the principal GHGs. When concentrations of these gases exceed natural concentrations in the atmosphere, the greenhouse effect may be enhanced. CO_2, CH_4, and N_2O occur naturally but are also generated through human activity. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing[1] associated with agricultural practices and landfills. Other human-

[1] Off-gassing is defined as the release of chemicals under normal conditions of temperature and pressure.

generated GHGs, which have much higher heat-absorption potential than CO_2, include fluorinated gases such as hydrofluorocarbons (HFCs), perfluorocarbons (PFC), and sulfur hexafluoride (SF_6), which are byproducts of certain industrial processes.

CO_2 is the reference gas for climate change because it is the predominant GHG emitted. The effect that each of the aforementioned gases can have on global warming is a combination of the mass of their emissions and their global warming potential (GWP). GWP indicates, on a pound-for-pound basis, how much a gas is predicted to contribute to global warming relative to how much warming would be predicted to be caused by the same mass of CO_2, CH_4, and N_2O are substantially more potent GHGs than CO_2, with GWPs of 25 and 310 times that of CO_2, respectively.

In emissions inventories, GHG emissions are typically reported in terms of pounds or metric tons (MTs) of CO_2 equivalents (CO_2e). CO_2e are calculated as the product of the mass emitted of a given GHG and its specific GWP. While CH_4 and N_2O have much higher GWPs than CO_2, CO_2 is emitted in such vastly higher quantities that it accounts for the majority of GHG emissions in CO_2e.

Fossil fuel combustion, especially for the generation of electricity and powering of motor vehicles, has led to substantial increases in CO_2 emissions (and thus substantial increases in atmospheric concentrations of CO_2). In pre-industrial times (c. 1860), concentrations of atmospheric CO_2 were approximately 280 parts per million (ppm) (GRID-Arendal, 2013).By August 2013, atmospheric CO_2 concentrations had increased to 395 ppm, by over 40% above pre-industrial concentrations (ESRL, 2013). There is international scientific consensus that human-caused increases in GHGs have contributed and will continue to contribute to global warming.

Impacts of Climate Change

Impacts in California

Global warming impacts in California include loss in snow pack, rise in sea level, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years. Secondary effects are likely to include the displacement of thousands of coastal businesses and residences, loss of infrastructure, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. Global warming would cause detrimental effects to some of the state's largest industries, including agriculture, winemaking, tourism, skiing, commercial and recreational fishing, forestry, and electrical power generation:"[t]he impacts of global warming are already being felt in California. The Sierra snowpack, an important source of water supply for the state, has shrunk 10% in the last 100 years. It is expected to continue to decrease by as much as 25% by 2050. World-wide changes are causing sea levels to rise – about 8 inches of increase has been recorded at the Golden Gate Bridge over the past 100 years – threatening low coastal areas with inundation and serious damage from storms" (CARB, 2008).

Ecosystem and Biodiversity Impacts

Climate change is expected to have effects on diverse types of ecosystems, from alpine to deep-sea habitat (U.S. EPA, 2008a). As temperatures and precipitation change, seasonal shifts in vegetation would occur; this could affect the distribution of associated flora and fauna species. As the range of species shifts, habitat fragmentation could occur, with acute impacts on the distribution of certain sensitive species. The IPCC states that "20 percent to 30 percent of species assessed may be at risk of extinction from climate change impacts within this century if global mean temperatures exceed 2 to 3°C (3.6 to 5.4°F) relative to pre-industrial levels"(IPCC, 2007). Shifts in existing biomes could also make ecosystems vulnerable to encroachment by invasive species. Wildfires, which are an important control mechanism in many ecosystems, may become more severe and more frequent, making it difficult for native plant species to repeatedly re-germinate. In general terms, climate change is expected to put a number of stressors on ecosystems, with potentially catastrophic effects on biodiversity.

Human Health Impacts

Climate change may increase the risk of vector-borne infectious diseases, particularly those found in tropical areas and spread by insects such as malaria, dengue fever, yellow fever, and encephalitis (U.S. EPA, 2008b). Cholera, which is associated with algal blooms, could also increase (NCBI, 1993). While these health impacts would largely affect tropical areas, effects would also be felt in California. For example, warming of the atmosphere is expected to increase smog and particulate pollution, which will adversely affect individuals with heart and respiratory problems, such as asthma. Extreme heat events are also expected to occur with more frequency. The elderly, children, and the homeless are particularly vulnerable to extreme heat events. Finally, the water supply impacts and seasonal temperature variations expected as a result of climate change could affect the viability of existing agricultural operations, making the food supply more vulnerable.

Greenhouse Gas Emissions Estimates

Global Emissions

Worldwide emissions of GHGs in 2011 were 25 billion tons of CO_2e per year (UNFCCC, 2013). This figure includes ongoing emissions from industrial and agricultural sources, but excludes emissions from land use changes.

U.S. Emissions

In 2009, the United States emitted about 6.7 billion tons of CO_2e or about 21 tons/ person/ year. Of the four major sectors nationwide — residential, commercial, industrial, and transportation — transportation accounts for the highest fraction of GHG emissions (approximately 33%); these emissions are entirely generated from direct fossil fuel combustion (U.S. EPA, 2011).

State of California Emissions

In 2011, California emitted approximately 448 million tons of CO_2e, or about 7% of U.S. emissions. This large number is due primarily to the sheer size of California compared to other states. By contrast, California has one of the lowest per capita GHG emission rates in the country, due to the success of its energy efficiency and renewable energy programs and commitments that have lowered the state's GHG emissions rate of growth by more than half of what it would have been otherwise (CEC, 2007). Another factor that has reduced California's fuel use and GHG emissions is its mild climate compared to that of many other states.

The California Environmental Protection Agency's Climate Action Team stated in its March 2006 report that the composition of gross climate change pollutant emissions in California in 2002 (expressed as CO_2e) were as follows (CalEPA, 2006):

- Carbon dioxide (CO_2) accounted for 83.3%;
- Methane (CH_4) accounted for 6.4%;
- Nitrous oxide (N_2O) accounted for 6.8%; and
- Fluorinated gases (HFCs, PFC, and SF_6) accounted for 3.5%.

The California Energy Commission (CEC) found that transportation is the source of approximately 41% of the state's GHG emissions, followed by electricity generation (both in-state and out-of-state) at 23% and industrial sources at 20%. Agriculture and forestry are the source of approximately 8.3%, as is the source categorized as "other," which includes residential and commercial activities (CEC, 2007).

Bay Area Emissions

In the San Francisco Bay Area, the transportation sector and industrial/commercial sector represent the largest sources of GHG emissions, accounting for 36.4% each of the Bay Area's 95.8 million tons of CO_2e in 2007. Electricity/co-generation sources account for about 15.9% of the Bay Area's GHG emissions, followed by residential fuel usage at about 7.1%. Off-road equipment and agricultural/farming sources currently account for approximately 3% and 1.2% of the total Bay Area GHG emissions, respectively (BAAQMD, 2010).

City of Sunnyvale Emissions

The City of Sunnyvale drafted a Climate Acton Plan in 2011, which includes baseline GHG inventories, future year inventory projections, a GHG reduction goal, and GHG emissions recommendations. The Climate Action Plan is still under review by the City. The current Draft Climate Action Plan proposes to establish a GHG reduction goal of 15% below year 2008 emissions levels by 2020 (under AB32, assumed to be equivalent to 1990 levels) and 80% below 1990 levels by 2050. The City's baseline year (2008) community inventory amounts to 1,270,170 MT CO2e, and is made up of various sources. Of the sources in this total, the largest contributors include commercial/industrial energy, on-road transportation, residential energy, and community waste, which contribute 39%, 35%, 16%, and 6%, respectively (City of Sunnyvale, 2011a).

Regulatory Framework

Federal

U.S. Environmental Protection Agency "Endangerment" and "Cause or Contribute" Findings

In *Massachusetts v. Environmental Protection Agency* et al., 12 states and cities, including California, together with several environmental organizations, sued to require the U.S. EPA to regulate GHGs as pollutants under the Clean Air Act (127 S. Ct. 1438 (2007)). The U.S. Supreme Court ruled that GHGs fit within the Clean Air Act's definition of a pollutant and the U.S. EPA had the authority to regulate GHGs.

On December 7, 2009, the U.S. EPA Administrator signed two findings regarding GHGs under Section 202(a) of the federal Clean Air Act:

- **Endangerment Finding:** The current and projected concentrations of six key GHGs—CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6—in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, the U.S. EPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year (FY) 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), that required the U.S. EPA to develop "…mandatory reporting of GHGs above appropriate thresholds in all sectors of the economy…." The Reporting Rule applies to most entities that emit 25,000 metric tons of CO_2e or more per year. Starting in 2010, facility owners were required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. The Reporting Rule also mandates recordkeeping and administrative requirements in order for the U.S. EPA to verify annual GHG emissions reports.

State

The legal framework for GHG emission reduction in California has come about through Executive Orders, legislation, and regulation. The major components of California's climate change initiative are reviewed below.

Executive Order S-3-05

In 2005, in recognition of California's vulnerability to the effects of climate change, then-Governor Arnold Schwarzenegger established Executive Order S-3-05, which sets forth the following target dates by which statewide GHG emissions would be progressively reduced: by

2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80% below 1990 levels.

Assembly Bill 32 and the California Climate Change Scoping Plan

In 2006, the California legislature passed Assembly Bill 32 (California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32), also known as the Global Warming Solutions Act. AB 32 requires CARB to design and implement feasible and cost-effective emission limits, regulations, and other measures, such that statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25% reduction in emissions). AB 32 anticipates that the GHG reduction goals will be met, in part, through local government actions. CARB has identified a GHG reduction target of 15% from current levels for local governments themselves and notes that successful implementation of the plan relies on local governments' land use planning and urban growth decisions because local governments have primary authority to plan, zone, approve, and permit land development to accommodate population growth and the changing needs of their jurisdictions. Pursuant to AB 32, CARB adopted a Scoping Plan in December 2008 (re-approved by CARB on August 24, 2011 [CARB, 2008]) outlining measures to meet the 2020 GHG reduction goals. In order to meet these goals, California must reduce its GHG emissions by 30% below projected 2020 business-as-usual emissions levels or about 15% from today's levels. The Scoping Plan recommends measures for further study and possible State implementation, such as new fuel regulations. It estimates that a reduction of 174 million metric tons of CO_2e (about 191 million U.S. tons) from the transportation, energy, agriculture, forestry, and other sources could be achieved should the State implement all of the measures in the Scoping Plan. The Scoping Plan relies on the requirements of Senate Bill (SB) 375 (discussed below) to implement the carbon emission reductions anticipated from land use decisions. The Scoping Plan is currently being updated by CARB and is expected to be considered for approval in late spring of 2014.

Cap-and-Trade Program

The Scoping Plan identifies cap-and-trade as a key strategy for helping California reduce its GHG emissions (CARB, 2008). A cap-and-trade program sets the total amount of greenhouse gas emissions allowable for facilities under the cap and allows covered sources, including producers and consumers of energy, to determine the least expensive strategies to comply. AB 32 required CARB to adopt the cap-and-trade regulation by January 1, 2011, and the program itself was to begin in 2012. However, a San Francisco Superior Court judge issued a final order implementing a decision that found flaws in CARB's adoption of the Scoping Plan. CARB appealed the judge's order, which blocked CARB from implementing its recently adopted cap-and-trade program, and has obtained a temporary suspension from the appellate court. The first auction of "carbon offset credits" was held in November 2012.

Carbon offset credits are created through the development of projects, such as renewable energy generation or carbon sequestration projects, that achieve a reduction of emissions or an increase in the removal of carbon from the atmosphere from activities not otherwise regulated, covered under an emissions cap, or resulting from government incentives. Offsets are verified reductions of emissions whose ownership can be transferred to others. As required by AB 32, any reduction of GHG emissions used for compliance purposes must be real, permanent, quantifiable,

verifiable, enforceable, and additional. Offsets used to meet regulatory requirements must be quantified according to CARB-adopted methodologies, and CARB must adopt a regulation to verify and enforce the reductions. The criteria developed will ensure that the reductions are quantified accurately and are not double-counted within the system (CARB, 2008).

Executive Order S-1-07

Executive Order S-1-07, signed by then-Governor Arnold Schwarzenegger in 2007, proclaimed that the transportation sector is the main source of GHG emissions in California, at over 40% of statewide emissions. The order established a goal of reducing the carbon intensity of transportation fuels sold in California by a minimum of 10% by 2020. It also directed CARB to determine whether this Low Carbon Fuel Standard could be adopted as a discrete, early-action measure after meeting the mandates in AB 32. CARB adopted the Low Carbon Fuel Standard on April 23, 2009.

California Environmental Quality Act and Senate Bill 97

The California Environmental Quality Act (CEQA) requires lead agencies to disclose, consider, and mitigate the adverse environmental effects of projects they are considering for approval. GHG emissions have the potential to adversely affect the environment because they contribute to global climate change. Senate Bill 97 and other California regulations address global climate change through revisions to the CEQA *Guidelines* and implementation of GHG emission reduction programs as described below.

SB 97, signed in August 2007, acknowledges that climate change is a prominent environmental issue requiring analysis under CEQA. This bill directed the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Natural Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, no later than July 1, 2009. The California Natural Resources Agency was required to certify or adopt those guidelines by January 1, 2010.

On December 30, 2009, the Natural Resources Agency adopted the State CEQA *Guidelines* amendments, as required by SB 97. These State CEQA *Guidelines* amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in draft CEQA documents. The amendments became effective March 18, 2010.

The CEQA *Guidelines* § 15064.4 specifically address the significance of GHG emissions. Section 15064.4 calls for a "good-faith effort" to "describe, calculate or estimate" GHG emissions in CEQA environmental documents. Section 15064.4 further states that the analysis of GHG impacts should include consideration of (1) the extent to which the project may increase or reduce GHG emissions, (2) whether the project emissions would exceed a locally applicable threshold of significance, and (3) the extent to which the project would comply with "regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions." The revisions also state that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program (including plans or regulations

for the reduction of greenhouse gas emissions) that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located (§ [h]{3}). The CEQA *Guidelines* revisions do not, however, set a numerical threshold of significance for GHG emissions.

The revisions also include the following guidance (§ 15126.4[c]) on measures to mitigate GHG emissions, when such emissions are found to be significant:

> Consistent with § 15126.4(a), lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring or reporting, of mitigating the significant effects of greenhouse gas emissions. Measures to mitigate the significant effects of greenhouse gas emissions may include, among others:
>
> (1) Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision;
>
> (2) Reductions in emissions resulting from a project through implementation of project features, project design, or other measures;
>
> (3) Off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions;
>
> (4) Measures that sequester greenhouse gases; and
>
> (5) In the case of the adoption of a plan, such as a general plan, long range development plan, or plans for the reduction of greenhouse gas emissions, mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.

Assembly Bill 1493 (Pavley Standards)

In 2002, then-Governor Gray Davis signed Assembly Bill (AB) 1493, which required the California Air Resources Board (CARB) to develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the state."

To meet the requirements of AB 1493, CARB approved amendments to the California Code of Regulations (CCR) in 2004, adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to Title 13 CCR, Sections 1900 and 1961 (13 CCR 1900, 1961), and adoption of Section 1961.1 (13 CCR 1961.1), require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight [GVW] rating of less than 10,000 pounds and that is designed primarily for the transportation of persons), beginning with model year 2009. For passenger cars and light-duty trucks with a loaded vehicle weight (LVW) of 3,750 pounds or less,

the GHG emission limits for model year 2016 are approximately 37% lower than the limits for the first year of the regulations, model year 2009. For light-duty trucks with an LVW of 3,751 pounds to a GVW of 8,500 pounds, as well as for medium-duty passenger vehicles, GHG emissions will be reduced approximately 24% between 2009 and 2016.

Because the Pavley standards (named for the bill's author, State Senator Fran Pavley) would impose stricter standards than those under the federal Clean Air Act, California applied to the U.S. EPA for a waiver under the federal Clean Air Act; this waiver was denied in 2008. In 2009, however, the U.S. EPA granted the waiver.

Senate Bills 1078 and 107 and Executive Orders S-14-08 and S-21-09

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20% of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010.

In November 2008, then-Governor Schwarzenegger signed Executive Order S-14-08, which increased the State's Renewable Portfolio Standard to 33% renewable power by 2020. In September 2009, Governor Schwarzenegger continued California's commitment to the Renewable Portfolio Standard by signing Executive Order S-21-09, which directs CARB under its AB 32 authority to enact regulations to help the State meet its Renewable Portfolio Standard goal of 33% renewable energy by 2020.

The 33% by 2020 goal was codified in April 2011 with Senate Bill X1-2, which was signed by Governor Brown. This new Renewable Portfolio Standard preempts the CARB 33% Renewable Electricity Standard and applies to all electricity retailers in the State, including publicly owned utilities (POUs), investor-owned utilities, electricity service providers, and community choice aggregators. All of these entities must adopt the new Renewable Portfolio Standard goals of 20% of retail sales from renewables by the end of 2013 and 25% by the end of 2016, with the 33% requirement being met by the end of 2020.

Senate Bill 1368

SB 1368 is the companion bill of AB 32 and was signed by then-Governor Schwarzenegger in September 2006. SB 1368 requires the California Public Utilities Commission (PUC) to establish a GHG emission performance standard for baseload generation from investor-owned utilities by February 1, 2007. The California Energy Commission was also required to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the PUC and California Energy Commission.

Senate Bill 375

In addition to policy directly guided by AB 32, the legislature in 2008 passed SB 375, which provides for regional coordination in land use and transportation planning and funding to help meet the AB 32 GHG reduction goals. SB 375 aligns regional transportation planning efforts, regional GHG emissions reduction targets, and land use and housing allocations. SB 375 requires Regional Transportation Plans (RTPs) developed by the State's 18 metropolitan planning organizations (MPOs) to incorporate a "sustainable communities strategy" (SCS) that will achieve GHG emission reduction targets set by CARB. SB 375 also includes provisions for streamlined CEQA review for some infill projects, such as transit-oriented development. The Metropolitan Transportation Commission (MTC) is responsible for developing RTPs for the San Francisco Bay Area. MTC's 2013 RTP will be its first plan subject to SB 375.

Regional

In June 2010, the Bay Area Air Quality Management District (BAAQMD) issued its *CEQA Air Quality Guidelines*, replacing former guidelines adopted in December 1999, and adopted new thresholds of significance to assist lead agencies in determining when potential air quality impacts would be considered significant under CEQA. Updated in May 2012, these guidelines include recommendations for analytical methodologies to determine air quality impacts and identify mitigation measures that can be used to avoid or reduce air quality impacts, including impacts of GHGs (BAAQMD, 2012).

In May of 2011 the BAAQMD adopted new Thresholds of Significance (2011 Thresholds) for GHG impacts. Subsequently, the Alameda Superior Court issued a stay and required the BAAQMD to conduct additional environmental review in connection with its adoption of the thresholds. However, in August 2013 the State Court of Appeal issued a full reversal of the Superior Court ruling, although at the time of this analysis, BAAQMD has not formally readopted these thresholds. Notwithstanding formal adoption, the 2011 Thresholds are based on substantial evidence provided by BAAQMD (BAAQMD, 2009), and have been accepted by the City of Sunnyvale for use in this EIR.

The threshold for stationary sources is 10,000 metric tons of CO_2e per year (i.e., emissions above this level may be considered significant). For non-stationary sources, three separate thresholds have been established:

- Compliance with a Qualified Greenhouse Gas Reduction Strategy (i.e., if a project is found to be out of compliance with a Qualified Greenhouse Gas Reduction Strategy, its GHG emissions may be considered significant); or
- 1,100 metric tons of CO_2e per year (i.e., emissions above this level may be considered significant); or
- 4.6 metric tons of CO_2e per service population (SP) per year (i.e., emissions above this level may be considered significant). "Service population" is the sum of residents plus employees expected for a development project.

For quantifying a project's GHG emissions, BAAQMD recommends that all GHG emissions from a project be estimated, including a project's direct and indirect GHG emissions from operations. Direct emissions refer to emissions produced from on-site combustion of energy, such as natural gas used in furnaces and boilers, emissions from industrial processes, and fuel combustion from mobile sources. Indirect emissions are emissions produced offsite from energy production and water conveyance due to a project's energy use and water consumption. BAAQMD has provided guidance on detailed methods for modeling GHG emissions from proposed projects (BAAQMD, 2012). The above stated thresholds apply only to operational emissions. To date, the BAAQMD has not adopted numeric thresholds for the assessment of construction-related emissions.

Local

City of Sunnyvale General Plan

The City of Sunnyvale General Plan sets forth policies and programs to be used by the public, planning staff, and decision makers when reviewing and analyzing proposed developments. Sunnyvale's General Plan consists of a Community Vision and five supporting chapters addressing the physical development of the City. These chapters group related topics together such as Community Character, Safety and Noise, and Environmental Management. The *Housing Element* of the General Plan provides the following applicable strategies and policies to increase building energy efficiency to reduce GHG emissions (City of Sunnyvale, 2011b).

- **Goal HE-6: Sustainable Neighborhoods.** Maintain sustainable neighborhoods with quality housing, infrastructure and open space that fosters neighborhood character and the health of residents.
    - ***Policy HE-6.6*:** Encourage use of sustainable and green building design in new and existing housing.

City of Sunnyvale Draft Climate Action Plan

The City of Sunnyvale Climate Action Plan, currently in draft form, provides a path for creating a more sustainable, healthy, and livable Sunnyvale. The draft CAP outlines transportation, land use, energy, and waste reduction measures to achieve its reduction target and proposes a timeline for implementation. It includes a baseline GHG inventory, GHG inventory projections, and GHG reduction recommendations to help the City achieve the AB 32 goal of a 15% reduction in emissions below baseline year 2005 emissions by 2020 (City of Sunnyvale, 2011a).

The General Plan Land Use and Transportation Element (LUTE) and the Draft CAP are interrelated. The LUTE focuses on land use, transportation, and related items within Sunnyvale, while the CAP is an overarching document focusing on other sectors of sustainable development in addition to transportation and land use. The transportation and land use portion of the CAP includes the applicable goals and policies of the LUTE that affect the Draft CAP. The LUTE includes policies from the Draft CAP that affect land use and transportation. The City is currently preparing an EIR to evaluate the effects of implementing both the LUTE and the Draft CAP.

Impacts and Mitigation Measures

This analysis evaluates the Project's impacts related to greenhouse gases emission and climate change. The evaluation considered Project plans, current CEQA *Guidelines* Appendix G significance thresholds, conditions at the Project site, and applicable regulations and guidelines.

Significance Criteria

Significance criteria used in this analysis are based on Appendix G of the CEQA *Guidelines*, and the BAAQMD's 2011 Thresholds for GHG emissions. Specifically, the Project would have a significant effect on the environment if it were to:

- Generate greenhouse gas emissions in excess of 1,100 metric tons of CO_2e annually or 4.6 MT CO_2e/SP/yr;
- Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases; or
- Fail to implement feasible and applicable best management practices to reduce GHG emissions.

Approach to Analysis

Potential impacts are assessed by modeling the estimated CO_2 emissions generated by Project construction and operations, using the CalEEMod version 2013.2.1 land use emissions model, and comparing modeled emissions to the significance thresholds.

Both BAAQMD and California Air Pollution Control Officers Association (CAPCOA) consider GHG impacts to be exclusively cumulative impacts, in that no single project could, by itself, result in a substantial change in climate. (BAAQMD, 2012 and CAPCOA, 2008). Therefore, the evaluation of GHG impacts evaluates whether the project would make a considerable contribution to cumulative climate change effects.

Impact Analysis

Impact GHG-1: The Project would result in an increase in GHG emissions. (Significant)

The Project would generate GHG emissions from a variety of sources, including Project construction and Project operations.

Construction Emissions

Construction emissions from the Project were estimated using the CalEEMod emissions model. Sources would include fossil fuel combustion by construction vehicles and equipment. Construction-related GHG emissions for each year of the anticipated 22 month construction period are presented in **Table 3.6-1**. All model inputs and output are provided in **Appendix D**. Estimated emissions are 1,415 metric tons of carbon dioxide equivalent greenhouse gases (CO_2e) in 2014

TABLE 3.6-1
ESTIMATED CONSTRUCTION-RELATED GHG EMISSIONS

Emission Source	Total Emissions (MT CO_2e)			
	CO_2	CH_4	N_2O	Total CO_2e
2014	1,412	0.14	<0.01	1,415
2015	956	0.08	<0.01	957
Total	–	–	–	2,371

Source: ESA (Appendix D)

and 957 metric tons CO_2e in 2015. As discussed earlier, BAAQMD has not established a quantitative threshold relative to construction-related emissions. In lieu of any proposed or adopted thresholds relative to construction-related emissions, these emissions are considered significant unless best management practices are implemented to reduce GHG emissions during construction, as feasible. Consequently, **Mitigation Measure GHG-1** is identified to ensure implementation of best management practices during construction.

Operational Emissions

Area, Energy, and Indirect Sources

Operational GHG emissions associated with the Project would result from electrical and natural gas usage, water and wastewater transport (the energy used to pump water and wastewater to and from the Project site), and solid waste generation. GHG emissions from electrical usage are generated when energy consumed on the site is generated by the electrical supplier, PG&E. GHG emissions from natural gas are direct emissions resulting from on-site combustion for heating and other purposes. GHG emissions from water and wastewater transport are also indirect emissions resulting from the energy required to transport water from its source, and the energy required to treat wastewater and transport it to its treated discharge point. Solid waste-related emissions are generated when the increased waste generated by the Project is disposed in a landfill where it decompose, producing methane gas.[2]

GHG emissions from electrical usage, natural gas combustion, mobile transportation, water and wastewater conveyance, and solid waste were estimated using the CalEEMod model, and are presented in **Table 3.6-2**. Energy use (electrical and natural gas) represents approximately 63% of estimated operational GHG emissions. Solid waste represents approximately 3% of operational GHG emissions and water usage represents approximately 4%.

The removal of mature landscape trees during construction would result in an initial release of the carbon stored in the trees, and furthermore would result in the loss of the capacity for these trees to continue to grow and sequester carbon from the atmosphere. As described in Chapter 2, Project Description, approximately 282 trees will be removed. However, these trees will be replaced by

[2] CH_4 from decomposition of municipal solid waste deposited in landfills is counted as an anthropogenic (human-produced) GHG. (USEPA, 2006).

TABLE 3.6-2
PROJECT INCREMENT OPERATIONAL GHG EMISSIONS

Emission Source	Total Emissions (MT CO_2e)/Year			
	CO_2	CH_4	N_2O	Total CO_2e
Area Sources	<1	<1	<1	<1
Energy Sources	4,882	<1	<1	4,902
Mobile Sources	2,252	<1	<1	2,253
Solid Waste	98	5.8	<1	220
Water and Wastewater	232	3	<1	318
Total	**8,985**	**9**	**<1**	**7,693**

Note: Columns may not total precisely due to rounding.

Source: ESA (Appendix D)

200 new trees. As the new trees grow, they will sequester carbon from the atmosphere, and so will approximately offset the loss of sequestered carbon and carbon sequestration potential from the removal of existing trees.

Mobile Emission Sources

Once operational and fully occupied, the proposed development would result in an increase of an estimated 3,023 daily vehicle trips above baseline levels, as described in Section 3.4, *Traffic and Circulation*. GHG emissions from motor vehicle sources were calculated using the CalEEMod. Table 3.6-2 presents the incremental mobile source GHG emissions associated with the Project, which represent approximately 29% of the total operational GHG emissions.

As shown in Table 3.6-2, the sum of both direct and indirect GHG emissions resulting from operation of the Project would result in an estimated 7,693 metric tons per year of CO_2e.[3] This is above the 1,100 metric ton per year threshold established by the BAAQMD. However, emissions would be below the service population threshold of 4.6 MT CO_2e/SP/yr, with Project emissions estimated to be approximately 3.1 MT CO_2e/SP/yr[4]. Operational GHG emissions would therefore be less than significant.

Additionally, as discussed in Chapter 2, Project Description, sustainability features of the Project include LEED Platinum CS certification; “Net-Zero ready” amenities building (i.e., designed to be ready for add-ons to achieve a net-zero energy system), solar photovoltaic array on the parking garage roof, solar photovoltaic-ready roofs, and use of reclaimed water. The solar PV array on the parking garage roof would reduce grid electricity consumption by approximately 856 MWh per year and GHG emissions by 154 MT CO2e per year.[5] These design features would reduce operational GHG emissions of the Project to less than those estimated in Table 3.6-2.

3 CO_2e in all calculations of Project impact include CO_2, CH_4 and N_2O.
4 Total of 7,658 MT CO2e divided by employee occupancy of 2,500.
5 Calculated based on the assumption that the area of the solar PV array on top of the parking structure would be equivalent to 75% of one entire level of the garage, or 52,232 square feet. For every 100 square feet of solar panel area, the electrical generation is expected to be approximately 1.64 MWh/yr. GHG emission factors provided by PG&E for year 2011 (latest emission factor available) is 393 lbs CO2e/MWh (PG&E, 2013).

Consequently, the Project would have a less-than-significant impact with respect to operational greenhouse gas emissions.

Mitigation Measure

Mitigation Measure GHG-1: Construction-Related GHG Reduction Measures. The following BAAQMD-suggested measures shall be implemented during Project construction:

- Use alternative fueled (e.g., biodiesel, electric) construction vehicles/equipment of at least 15% of the fleet;
- Use locally sourced building materials for at least 10% of overall materials brought to site; and
- Recycle or reuse at least 50% of construction waste or demolition materials.

Significance after Mitigation: *Less than Significant.* Implementation of Mitigation Measure GHG-1 would ensure that the applicant employs feasible, effective measures to reduce GHG emissions during Project construction. This mitigation measure would therefore reduce this impact to less than significant.

Impact GHG-2: The Project could conflict with the AB 32 Scoping Plan or City of Sunnyvale Plans and Policies for reducing GHG emissions. (Less than Significant)

The State of California's Climate Change Scoping Plan identifies 39 Recommended Actions (qualitative measures) to address climate change. Of the 39 measures identified, those that would be considered to have the greatest potential applications to the Project would be those actions related to electricity and natural gas use, and green building design (GB).

Scoping Plan Actions E-1 and GB-1 together aim to reduce electricity demand by increased efficiency of Utility Energy Programs and adoption of more stringent building and appliance standards. Elements of this action include encouraging construction of zero net energy buildings and implementation of passive solar design, all of which are proposed as Project elements.

The Project would be designed to meet certain criteria established by the Leadership in Energy and Environmental Design (LEED) certification program, which allots points for various energy-saving and environmentally preferable features. As described above, the applicant has committed to achieving LEED Platinum CS certification, the highest LEED building certification available. Achievement of LEED Platinum CS certification would demonstrate that the Project would be highly energy, waste, and water-efficient. LEED Platinum CS certification would also ensure that the Project addresses GHG reduction measures encapsulated in the proposed City of Sunnyvale Climate Action Plan.

Consequently, as the Project would implement a variety of green building design measures and use renewable energy sources, it would be consistent with the Recommended Actions of the

Climate Change Scoping Plan adopted by CARB to achieve the goals of AB 32, as well as the proposed City Climate Action Plan and General Plan. In addition, Mitigation Measure GHG-1 addresses City of Sunnyvale General Plan GHG reduction goals and policies. Therefore, the Project would not conflict with the GHG reduction measures identified in CARB's AB 32 Scoping Plan or other applicable plan or policy for reducing GHG emissions.

Since the Project would incorporate stringent design features that would reduce GHG emissions to a minimal level, the Project would remain in compliance with CARB's AB 32 Scoping Plan and other applicable plans and policies for reducing GHG emissions, and therefore would ensure that the Project's impact on GHGs is less-than-significant.

Mitigation: None required.

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3.7 Noise

Introduction

This section provides an overview of the existing noise environment at the proposed Project site and surrounding area, the regulatory framework, an analysis of potential noise impacts that would result from implementation of the Project, and mitigation measures where appropriate.

Environmental Setting

Technical Background

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise is defined as unwanted sound. The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. Sound pressure level is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain. Because sound pressure can vary greatly within the range of human hearing, a logarithmic loudness scale is used to keep sound intensity numbers at a convenient and manageable level.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). When all the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequency spanning 20 to 20,000 Hz.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. When assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA).[1] Frequency A-weighting is typically applied to community noise measurements.

Noise Exposure and Community Noise

Noise exposure is a measure of the noise experienced by the individual over a period of time. A noise level is a measure of noise at a given instant in time. However, noise levels rarely persist consistently over a long period of time. Rather, community noise varies continuously with time with respect to the contributing sound sources in the environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and changes in atmospheric conditions. What makes

[1] All noise levels reported herein reflect A-weighted decibels unless otherwise stated.

community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual.

These successive additions of sound to the community noise environment make the community noise level variable from instant to instant, requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

L_{eq}: The equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The L_{eq} is the constant sound level, which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).

L_{max}: The instantaneous maximum noise level measured during the measurement period of interest.

L_x: The sound level that is equaled or exceeded x percent of a specified time period. The L_{50} represents the median sound level.

DNL (or "Ldn"): The energy average of the A-weighted sound levels occurring during a 24-hour period, and which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night ("penalizing" nighttime noises). Noise between 10:00 PM and 7:00 AM is weighted (penalized) by adding 10 dBA to take into account the greater annoyance of nighttime noises. This noise descriptor is referred to by different agencies and references as either DNL or Ldn. The two notations refer to the same noise descriptor.

CNEL: Similar to the DNL, the Community Noise Equivalent Level (CNEL) adds a 5-dBA "penalty" for the evening hours between 7:00 PM and 10:00 PM in addition to a 10-dBA penalty between the hours of 10:00 PM and 7:00 AM.

Effects of Noise on People

The effects of noise on people can be placed into three categories:

- subjective effects of annoyance, nuisance, dissatisfaction;
- interference with activities such as speech, sleep, learning; and
- physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants generally experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation exists in the individual thresholds of annoyance, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so called “ambient noise” level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- outside of the laboratory, a 3-dBA change is considered a just-perceivable difference;
- a change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- a 10-dBA change is subjectively heard as approximately a doubling in loudness, and can cause adverse response.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion; hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, but instead combine logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate of 6 to 7.5 dBA per doubling of distance from the source, depending on the topography of the area and environmental conditions (i.e., atmospheric conditions and noise barriers, either vegetative or manufactured, etc.). Widely distributed noise, such as a large industrial facility spread over many acres or a street with moving vehicles, would typically attenuate at a lower rate, approximately 3 to 4.5 dBA per doubling of distance from the source.

Existing Noise Environment

Transportation sources, such as automobiles, trucks, trains, and aircraft, are the principal sources of noise in most urban environments. Along major transportation corridors, noise levels can reach 80 DNL, while along arterial streets, noise levels typically range from 65 to 70 DNL. The Safety and Noise chapter of the Sunnyvale General Plan provides a 2010 Noise Conditions Map, which shows approximate ambient noise levels throughout the City (City of Sunnyvale, 2011). The map indicates that the portions of the Project site where buildings are proposed are subject to an existing noise level as high as 60 to 64 dBA. The Principal noise source is traffic on the streets adjacent to the Project site.

The Project site is in the City of Sunnyvale, and the major noise source is vehicular traffic on the surrounding street network, including the Central Expressway and East Arques Avenue. There is an airport approximately 2 miles northwest of the Project site (Moffett Air Field). The Comprehensive Land Use Plan for Moffett Federal Airfield indicates that the Project Site is not located within Airport Influence Area or within the noise contours published for the airfield,

indicating that the contribution of aircraft noise from the airfield is less than 60 dBA, CNEL (Santa Clara County ALUC, 2012). The Caltrain rail line is located approximately 1/3 mile to the south of the Project site. The Noise Element of the City of Sunnyvale General Plan indicates that the railroad generates a noise level of up to 74 dBA at a distance of 50 feet. At one third mile, a line source would be attenuated to below 60 dBA.

Sensitive Receptors

Some land uses are considered more sensitive to ambient noise levels than others because of the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residences, schools, rest homes, hospitals, and churches are generally more sensitive to noise than commercial and industrial land uses. Residential uses (apartment buildings) are located approximately 575 feet northwest of the site of proposed Building 1. The Chung Tai Zen Center of Sunnyvale is located at 750 East Arques Avenue, approximately 350 feet west of the Project site, and the Iranian Christian Church is located approximately 600 feet west of the Project site. The Zen Center is planning to expand into an adjacent building and construct residences for monks. This building, on North Wolfe Road, is about 150 feet west of the Project site. These represent the nearest sensitive receptors. Other land uses in the area are commercial, industrial, and service, and are not considered noise sensitive receptors. A dog care and boarding facility exists approximately 350 feet east of the site of the proposed parking structure. Domestic animals are not, however, considered sensitive receptors, for the purpose of this CEQA analysis.

Regulatory Framework

Federal

Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 Code of Federal Regulations (CFR), Part 205, Subpart B. The federal truck pass-by noise standard is 80 dBA at 15 meters from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers.

Noise issues are addressed in Title 24 of the *California Code of Regulations* (for new multifamily residential developments), local general plan policies, and local noise ordinance standards and municipal codes related to noise. Federal, state, and local agencies regulate different aspects of environmental noise.

State of California

State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are collectively known as the California Noise Insulation Standards and are found in *California Code of Regulations*, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. There are no comparable noise standards for office or other commercial structures.

Local

In California, local regulation of noise involves implementation of General Plan policies and Noise Ordinance standards. Local General Plans identify general principles intended to guide and influence development plans, and Noise Ordinances set forth the specific standards and procedures for addressing particular noise sources and activities. General Plans recognize that different types of land uses have different sensitivities toward their noise environment; residential areas are considered to be the most sensitive type of land use to noise and industrial/commercial areas are considered to be the least sensitive.

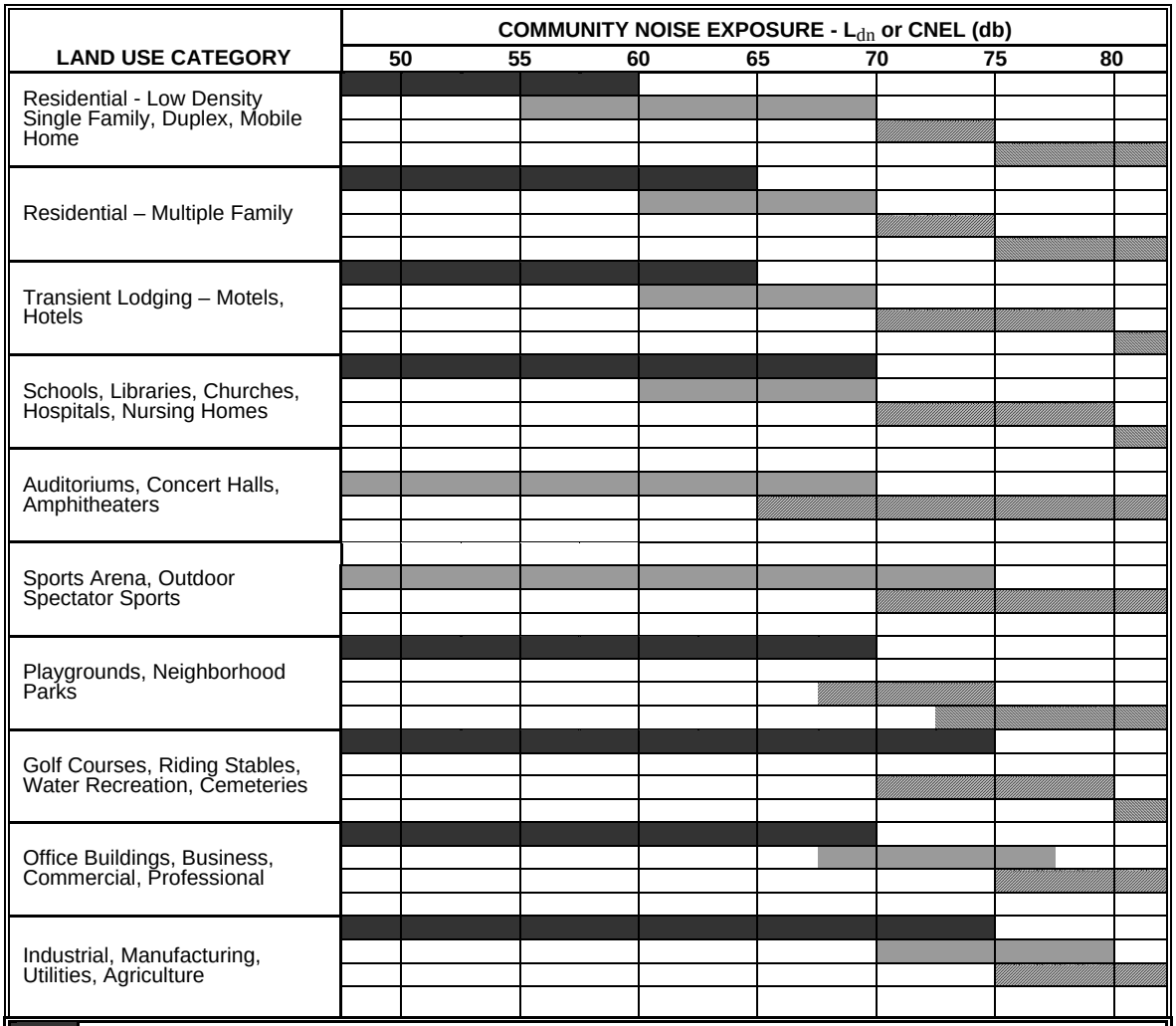
City of Sunnyvale General Plan

The Noise Element of the City of Sunnyvale General Plan, adopted in 1997, identifies noise and land use compatibility standards for various land uses. State of California Acceptable Noise Levels **Table 3.7-1**, which is based on the California Office of Planning and Research, General Plan Guidelines, [2003], indicates that commercial uses such as office buildings are normally acceptable in noise environments up to 70 dBA Ldn (OPR, 2003).

The City of Sunnyvale General Plan also identifies policies and programs that the City shall implement during the environmental review of projects in order to minimize noise throughout the community. Goals and Policies presented in the Noise Element applicable to this Project are as follows:

- **Goal SN-8: Compatible Noise Environment.** Maintain or achieve a compatible noise environment for all land uses in the community.
    - ***Policy SN-8.1*****:** Enforce and supplement state laws regarding interior noise levels of residential units.
    - ***Policy SH-8.2*****:** Apply Title 24 noise insulation requirements to all new single-family detached homes.
    - ***Policy SN-8.3*****:** Attempt to achieve a maximum instantaneous noise level of 50 DBA in bedrooms and 55 DBA in other areas of residential units exposed to train or aircraft noise, where the exterior LDN exceeds 55 DBA.
    - ***Policy SN-8.4*****:** Prevent significant noise impacts from new development by applying state noise guidelines and Sunnyvale Municipal Code Noise Regulations in the evaluation of land use issues and proposals.
    - ***Policy SN-8.5*****:** Comply with "State of California Noise Guidelines for Land Use Planning" for the compatibility of land uses with their noise environments, except where the City determines that there are prevailing circumstances of a unique of special nature.
    - ***Policy SN-8.6*****:** Use Figure 6-6 (EIR **Table 3.7-2**) "Significant Noise Impacts from New Development on Existing Land Use" to determine if proposed development results in a "significant noise impact" on existing development.
    - ***Policy SN-8.9*****:** Consider techniques which block the path of noise and insulate people from noise.

TABLE 3.7-1
ACCEPTABLE NOISE LEVELS



	Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
	Normally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
	Clearly Unacceptable	New construction or development generally should not be undertaken.

SOURCE: California Office of Planning and Research, 2003. General Plan Guidelines.

TABLE 3.7-2
SIGNIFICANT NOISE IMPACTS FROM NEW DEVELOPMENT ON EXISTING LAND USE

Ldn Category of Existing Land Use (per Table 3.7-1)	Noise Increase from New Development that is Considered "Significant"
Normally Acceptable	An increase of more than 3 dBA if the resulting Ldn exceeds the "normally acceptable" category
Normally Acceptable	An increase of more than 5 dBA
Conditionally Acceptable	An increase of more than 3 dBA
Unacceptable	An increase of more than 3 dBA

SOURCE: City of Sunnyvale, 2011.

- **Goal SN-9: Acceptable Limits for Community Noise.** Maintain or achieve limits for the levels of noise generated by land use operations and single-events.
  - ***Policy SN-9.1*:** Regulate land use operation noise.
  - ***Policy SN-9.2*:** Regulate select single-event noises and periodically monitor the effectiveness of the regulations.
  - ***Policy SN-9.3*:** Apply conditions to discretionary land use permits which limit hours of operations, hours of delivery and other factors which affect noise.
- **Goal SN-10: Maintained or Reduced Transportation Noise.** Preserve and enhance the quality of neighborhoods by maintaining or reducing the levels of noise generated by transportation facilities.
  - ***Policy SN-10.1*:** Refrain from increasing or reduce the noise impacts of major roadways.

City of Sunnyvale Municipal Code

Section 16.08.030 of the City of Sunnyvale Municipal Code establish allowable hours of operation for construction-related activities. Section 9.48.010 limits amplified noise.

16.08.030. Hours of Construction—Time and Noise Limitations.

Construction activity shall be permitted between the hours of seven a.m. and six p.m. daily Monday through Friday. Saturday hours of operation shall be between eight a.m. and five p.m. There shall be no construction activity on Sunday or national holidays when city offices are closed.

No loud environmentally disruptive noises, such as air compressors without mufflers, continuously running motors or generators, loud playing musical instruments, radios, etc., will be allowed where such noises may be a nuisance to adjacent residential neighborhoods.

Exceptions:

a. Construction activity is permitted for detached single-family residential properties when the work is being performed by the owner of the property, provided

no construction activity is conducted prior to seven a.m. or after seven p.m. Monday through Friday, prior to eight a.m. or after seven p.m. on Saturday and prior to nine a.m. or after six p.m. on Sunday and national holidays when city offices are closed. It is permissible for up to two persons to assist the owner of the property so long as they are not hired by the owner to perform the work. For purposes of this section, "detached single-family residential property" refers only to housing that stands completely alone with no adjoining roof, foundation or sides.

b. As determined by the chief building official:

1. No loud environmentally disruptive noises, such as air compressors without mufflers, continuously running motors or generators, loud playing musical instruments, radios, etc., will be allowed where such noises may be a nuisance to adjacent properties.

2. Where emergency conditions exist, construction activity may be permitted at any hour or day of the week. Such emergencies shall be completed as rapidly as possible to prevent any disruption to other properties.

3. Where additional construction activity will not be a nuisance to surrounding properties, based on location and type of construction, a waiver may be granted to allow hours of construction other than as stated in this section. (Ord. 2930-10 § 2).

9.48.010. Operation During Certain Hours—Permit required.

No person shall operate any loudspeaker or sound amplifier or instrument, in such a manner as to cause any sound to be projected outside of any building, or out-of-doors, in any part of the city between the hours of ten p.m. and ten a.m., except during public events and affairs of interest to the general public, and then only on permit from the chief of the department of public safety. Such permit shall be granted upon application therefore, but shall be revocable by the chief of public safety whenever any such loudspeaker or sound amplifier or instrument is objectionable to, or disturbs the public peace, and in the event of the revocation of any such permit the same shall not be renewed without satisfactory proof to the chief of public safety that the public peace will no longer be disturbed.

Impacts and Mitigation Measures

Significance Criteria

Based on the *CEQA Guidelines,* Appendix G, a project would have a significant effect on the environment with respect to noise and/or ground-borne vibration if it would result in:

1. Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies;

2. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;

3. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;

4. Exposure of people residing or working in the area around the project site to excessive noise levels (for a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport);

5. Exposure of people residing or working in the area around the project site to excessive noise levels (for a project within the vicinity of a private airstrip); or

6. Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.

Approach to Analysis

Noise impacts are assessed based on a comparative analysis of the noise levels resulting from the Project and the noise levels under existing conditions. Analysis of temporary construction noise effects is based on: typical construction phases and equipment noise levels; attenuation of those noise levels due to distances; and any barriers between the construction activity and the sensitive receptors near the sources of construction noise. Operational impacts are analyzed using reference noise levels and attenuation for operational equipment.

The Project site is more than two miles distant from the nearest public or private airport or airstrip (Moffett Federal Airfield), and is not within the area of the Airport Land Use Plan for Moffett Federal Airfield or Mineta San Jose International Airport (see Section 3.1, Land Use and Planning). Moreover, as noted, the Project site is not within the noise contours for Moffett Federal Airfield. Therefore, criteria 4 and 5 do not apply to this Project, and will not be discussed further.

Impact Analysis

Impact NOI-1: Construction of the Project would result in a temporary increase in ambient noise levels. (Significant)

As noted above in the Setting section, the days and hours that construction activity noise can occur is restricted by Section 16.08.030 of the Sunnyvale Municipal Code. Construction is permitted to occur on weekdays between 7:00 AM and 6:00 PM or between 8:00 AM and 5:00 PM on Saturdays. Commercial construction activity is not permitted on Sundays or holidays. Construction of the Project would only occur during these permitted hours.

A substantial temporary noise level increase would occur where noise from construction activities exceeds 60 dBA Leq and the ambient noise environment increases by at least 5.0 dBA Leq at noise-sensitive uses in the vicinity of the Project site for a period of one year or more. In the Bay Area, construction can normally occur year-round, except for brief periods when rainy weather makes construction activities impossible or impractical. The 60 dBA Leq noise level limit is receiver-based, and this noise level is the level at which speech interference begins to occur outdoors. One construction season is considered a reasonable duration that allows most construction projects to be built, recognizing that noise from construction activities will be short-term and there is a definitive

end date to the construction activities. Construction of the Project, however, is expected to occur over a period an approximately 20 to 24 months, beginning in 2014 and completed by 2015.

Construction activity noise levels at and near the Project site would fluctuate depending on the particular type, number, and duration of uses of various pieces of construction equipment. Construction activities associated with the Project would involve excavation, grading, demolition and earth movement. **Table 3.7-3** shows typical noise levels during different construction stages. **Table 3.7-4** shows typical noise levels produced by various types of construction equipment.

TABLE 3.7-3
TYPICAL NOISE LEVELS FROM CONSTRUCTION ACTIVITY

Construction Phase	Noise Level[a] (dBA, Leq) at 50 feet	Noise Level[a] (dBA, Leq) at 350 feet	Noise Level[a] (dBA, Leq) at 575 feet
Ground clearing	84	66	60
Excavation	89	71	65
Foundations	78	60	54
Erection	85	67	61
Finishing	89	71	65

[a] Average noise levels correspond to the indicated distance from the noisiest piece of equipment associated with a given phase of construction and an additional 200 feet from the rest of the equipment associated with that phase.

SOURCE: Bolt, Baranek, and Newman, 1971; Cunniff, 1977.

TABLE 3.7-4
TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Level (dBA, Leq at 50 Feet)	Noise Level (dBA, Leq at 350 Feet)	Noise Level (dBA, Leq at 575 Feet)
Dump truck	88	70	64
Portable air compressor	81	63	57
Concrete mixer (truck)	85	67	61
Scraper	88	70	64
Jackhammer	88	70	64
Dozer	87	69	63
Paver	89	71	65
Generator	76	64	58
Backhoe	85	67	61
Pile driver	101	89	83

SOURCE: Federal Transit Administration, 2006 and FHWA, 2006.

The nearest existing sensitive residential receptors to the Project site are apartments located approximately 575 feet northwest of the proposed Building 1. There is an Iranian Christian church approximately 600 feet west of the Project site and an existing Zen Center approximately 350 feet west of the Project site. The Zen Center is planning to expand into an adjacent building, which is about 150 feet from the Project site. New residences for monks are planned at this site but not yet built. Other land uses surrounding the Project site are not considered noise sensitive. The closest existing residential receptors and the Iranian Christian church would be exposed to approximately

65 dBA Leq during excavation and finishing activities. The 2010 Noise Conditions Map of the Sunnyvale General Plan Noise Element indicates existing noise levels near the closest residential receptors to the Project site are in the range of 60 to 64 Ldn. Construction noise levels would be roughly equivalent to the ambient noise during the short-term duration of construction. Resultant noise levels would increase by approximately 3 dBA over existing conditions which would not be considered a significant construction noise impact. The Zen Center would be exposed to approximately 71 dBA Leq during excavation and finishing activities. Resultant noise levels would increase by approximately 8 dBA over existing conditions which would be considered a significant construction noise impact.

The proposed new buildings may be founded on driven, precast concrete piles. According to the construction schedule provided by the applicant, pile driving would take one to one and a half months, and would occur between the hours of 8:00 a.m. and 6:00 p.m. Monday through Friday. Pile driving can generate noise levels of 101 dBA at 50 feet (FHWA, 2006), which would be attenuated to 83 dBA at the nearest existing residence and 89 dBA at the Zen Center. Noise levels from pile driving could be as high as 95 dBA at the planned Zen Center residence, which would be located about 150 feet from the Project site. Over the approximately one-month period when pile driving would be taking place, Project noise would be more than 5 dBA above ambient conditions each time the pile driver strikes a pile, resulting in a significant noise impact. It is noted, however, that pile driving noise is not continuous and typically has a duration of several minutes while one pile is being driven, followed by a break of several more minutes while the machinery is moved and the subsequent pile is readied for installation, at which point the cycle begins again.

Pile driving would also elevate the ambient noise levels at the dog care and boarding facility, approximately 350 feet to the east of the proposed parking structure. Pile driving could generate noise up to 84 dBA at this dog care facility. Noise is a physical stressor on animals that can lead to behavioral, physiological, and anatomical responses. The hearing of animals differs from that of humans; dogs have much better hearing and can hear sounds up to four times quieter than can the human ear. There are currently no policies in the City's General Plan Noise Element or noise ordinance regulating noise levels in dog kennels. Studies have shown that dogs within kennels are exposed to noise levels exceeding 80 dBA between 30% and 60% of the time, largely as a result of combined barking within a kennel (Coppola, 2006). Furthermore, the facility is located adjacent to the Central Expressway. Therefore, the existing noise environment within the dog care and boarding facility may already be quite noisy. Pile driving could increase noise levels at this facility during Project construction. However, adverse affects of noise on domestic animals is not considered a significant impact under CEQA. Consequently, while the Project may be expected to cause adverse impacts to dogs at the dog care and boarding facility, this does not contribute to the significance conclusion for this impact.

Mitigation Measures

Mitigation Measure NOI-1a: Construction Noise Control Measures. The applicant shall employ site-specific noise attenuation measures during Project construction to reduce the generation of construction noise. These measures shall be included in a Noise Control Plan that shall be submitted for review and approval by the City of Sunnyvale Building Services

Division to ensure that construction noise is consistent with the standards set forth in the City's Noise ordinance. Measures specified in the Noise Control Plan and implemented during Project construction shall include, at a minimum, the following noise control strategies:

- Equipment and trucks used for construction shall use the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds;
- Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves shall be used where feasible; this could achieve a reduction of 5 dBA. Quieter procedures, such as use of drills rather than impact tools, shall be used;
- Stationary noise sources shall be located as far from adjacent receptors as possible, and they shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or include other measures.

Mitigation Measure NOI-1b: Pile Driving Noise-Reducing Techniques and Muffling Devices. Noise-reducing pile-driving techniques shall be employed during Project construction. These techniques shall include:

- Installing intake and exhaust mufflers on pile-driving equipment;
- Vibrating piles into place when feasible, and installing shrouds around the pile-driving hammer where feasible;
- Implement "quiet" pile-driving technology (such as pre-drilling of piles and the use of more than one pile driver to shorten the total pile driving duration), where feasible, in consideration of geotechnical and structural requirements and conditions;
- Use cushion blocks to dampen impact noise, if feasible based on soil conditions. Cushion blocks are blocks of material that are used with impact hammer pile drivers. They consist of blocks of material placed atop a piling during installation to minimize noise generated when driving the pile. Materials typically used for cushion blocks include wood, nylon and micarta (a composite material);
- At least 48 hours prior to pile-driving activities, the applicant shall notify building owners and occupants within 600 feet of the Project site of the dates, hours, and expected duration of such activities.

Significance After Mitigation: *Significant and Unavoidable*. The above measures would reduce the severity of noise generated by construction and pile driving activities and reduce the potential annoyance to nearby residents and others who could be disturbed by pile driving to the extent feasible. Although pile driving noise would be intermittent and would occur over a short duration (up to about six weeks in total), even after mitigation the noise level would likely exceed 5 dBA during pile driving activities and this impact would be significant and unavoidable.

Impact NOI-2: Project Construction could generate groundborne vibration. (Less than significant)

The types of construction activities associated with propagation of ground-borne vibration include pile driving, use of hoe-rams for demolishing large concrete structures and caisson drilling. It is possible that all of this equipment could be used during some portion of Project demolition and construction. The proposed new buildings may be founded on driven, precast concrete piles. Pile driving would take one to one and a half months, and would occur between the hours of 8:00 a.m. and 6:00 p.m. Monday through Friday.

Of the construction equipment likely to be used for Project demolition and construction, pile driving has the potential to result in the highest levels of groundborne vibration. Pile driving can result in peak particle velocities (PPV) of up to 1.5 inches per second (in/sec) at a distance of 25 feet (FTA, 2006), but typically results in an average of about 0.644 PPV at that distance. The Caltrans measure of the threshold of architectural damage for conventional sensitive structures is 0.5 in/sec PPV for new residential structures and modern commercial buildings and 0.25 in/sec PPV for historic and older buildings.

The nearest existing off-site structure is approximately 140 feet away from the site of the proposed buildings, where pile driving may occur. At this distance, vibration from pile driving would be expected to be reduced to 0.05 inches per second. Therefore, vibration from pile driving would not exceed the criterion published by Caltrans of 0.25 in/sec for the protection of fragile older buildings, or the 0.5 in/sec PPV criterion for newer buildings. Vibration levels would be slightly less at the nearest residential receptors (the planned residences at the Zen Center, about 150 feet away).

Consequently, the Project would have a less-than-significant impact with regard to groundborne vibration.

Mitigation: None required.

Impact NOI-3: Occupants of the proposed new buildings could be exposed to high noise levels. (Less than Significant)

As discussed above in the Setting section, the City of Sunnyvale General Plan establishes land use compatibility standards for new development within Sunnyvale. These standards are intended to ensure that occupants of new developments are not exposed to inappropriately loud noise. Ambient noise levels around new office buildings are “normally acceptable” if below 70 CNEL, and “conditionally acceptable” between 70 and 80 CNEL (City of Sunnyvale, 2011).

As stated in the setting, the Sunnyvale General Plan 2010 Noise Conditions Map indicates that the portions of the Project site where buildings are proposed are subject to an existing noise level as high as 64 dBA. This existing noise environment would be considered to be normally

acceptable for the proposed land use. Noise level exposure for occupants of the proposed new buildings would therefore be less than significant.

Mitigation: None required.

Impact NOI-4: Project operations could cause a long-term increase in ambient noise levels in the Project vicinity. (Less than significant)

Long-term noise sources associated with Project operations would include automobile traffic and an emergency power back-up generator, which would be located on the sixth floor of the parking garage. The generator would be tested regularly, and operated occasionally. Typically, the BAAQMD permits emergency backup generators to operate for up to 50 hours per year, or on average about one hour per week. The nearest sensitive receptors to the Project site include the residents of the Parkside Apartment Homes located more than 1,000 feet from the proposed generator location and the Zen Center, located approximately 720 feet from the proposed generator location.

Typical noise emissions from a 1,000 kW generator are 94 dBA at 23 feet (ASHRAE, 2005). At the nearest existing sensitive receptor (the Zen Center), this noise level would attenuate to 62 dBA, and at the future residences associated with the Zen Center, to about 63 dBA, after accounting for the presence of intervening structures. This would be similar to existing noise levels along a 100 foot setback from North Wolfe Road (City of Sunnyvale, 2011). Consequently, generator noise would result in a less than 3 dBA increase in the noise environment at the nearest sensitive receptor and would have a less-than-significant impact. Noise levels from the generator at the dog care and boarding facility, approximately 350 feet to the east of the proposed parking structure location, would be 70 dBA. This noise level would be up to approximately 5 dBA greater than existing noise levels along a 50 foot setback from Central Expressway, as indicated in the Noise Element of the City of Sunnyvale General Plan. This degree of noise increase for one hour or less per week would not be expected to have a substantial adverse impact on visitors or occupants of the dog care facility, including dogs. As previously stated, noise impacts on domestic animals, including dogs, are not considered a potential impact under CEQA.

The Project may include construction of a new amphitheater, to be located within the proposed central quad. The applicant has stated that the central quad is intended to provide an opportunity for social interaction and individual respite. The current Project plans do not show a formal amphitheater and there are no stated plans to use an amphitheater for concerts or other performances. Once the Project is constructed however, there is the possibility that the amphitheater could be used for private or public concerts or other performances. This would not, however, be expected to result in a significant noise impact since the central quad would be located at the center of the Project site and surrounded by tall buildings, so noise would tend to attenuate or to be blocked before it reached sensitive receptors. Furthermore, any use of amplified sound would be subject to City of Sunnyvale Municipal Code Section 9.48.010, which limits the use of amplified sound outdoors, and which requires a separate permit for amplified sound. The

Municipal Code would limit any future use of the amphitheater to uses that did not result in a substantial increase in ambient noise at the location of nearby sensitive receptors.

The Project would also generate additional vehicle traffic in and around the Project site. Increased traffic would primarily be on the local roadway network, including North Wolfe Road and East Arques Avenue. Based on the City of Sunnyvale's definition of significant noise increases (see Table 3.7-2), a project would be considered to generate a significant impact if it resulted in a permanent increase in ambient noise levels greater than 3 dBA in the project vicinity above levels existing without the project for areas already impacted by noise.

Noise levels were determined for this analysis using the Federal Highway Administration (FHWA) Traffic Noise Prediction Model and the turning movements in the traffic section for Existing (2013), Existing Plus Project, and Cumulative Plus Project conditions (**Appendix E**). Peak hour intersection turning data from the traffic study were analyzed to evaluate increases and resulting traffic-generated noise increases on roadway links most affected by Project-related traffic. The roadway segments analyzed and the results of the noise increases resulting from modeling are shown in **Table 3.7-5**, below.

TABLE 3.7-5
PEAK-HOUR TRAFFIC NOISE LEVELS IN THE VICINITY OF THE PROJECT

Roadway Segment[a,b]	Existing	Existing Plus Project	Difference between Existing Plus Project and Existing	Cumulative No Project (2023)	Cumulative Plus Project (2023)	Difference between Cumulative Plus Project and Existing
North Wolfe Road north of East Arques Avenue	66.8	67.0	0.2	67.7	67.9	1.1
North Wolfe Road south of East Arques Avenue	67.6	67.9	0.3	68.5	68.7	1.1
East Arques Avenue west of North Wolfe Road	62.0	62.7	0.7	62.9	63.5	1.5
East Arques Avenue east of North Wolfe Road	65.8	66.4	0.6	66.7	67.2	1.4

[a] Road center to receptor distance is 15 meters (approximately 50 feet) for all roadway segments. Noise levels were determined using the Federal Highway Administration (FHWA) Traffic Noise Prediction Model.
[b] The analysis considered the vehicle mix based on – cars 97%, medium trucks two percent, and heavy trucks one percent. Traffic speeds for all vehicle classes were set at 35 mph.

SOURCE: ESA (Appendix E)

As shown in Table 3.7-5, the increase in traffic noise from the Existing Plus Project and Cumulative Plus Project scenarios compared to the Existing scenario would increase peak hour noise levels by less than 3 dBA at all roadway segments. Overall, traffic noise impacts associated with the Project at all analyzed roadway segments in the vicinity of the Project site would be less than significant.

Mitigation: None required.

References

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3.8 Biological Resources

Introduction

This section provides an assessment of potential impacts of the Project on biological resources. Biological resources include special status plant and wildlife species, riparian habitat and other sensitive natural communities, wetlands, and wildlife movement corridors.

Environmental Setting

General Setting

The Project site is located in a highly urbanized area of Sunnyvale, and is distant from natural areas. Approximately 85% of the site is paved or developed, and therefore covered by impervious surfaces. The remainder consists of a combination of landscaped and ornamental vegetated areas.

Habitat and Vegetation

An ESA biologist conducted a reconnaissance survey of the Project site on August 15, 2013. Habitat on the Project site was observed to be very limited. Almost all of the vegetation is planted or ornamental. Many large, mature trees and shrubs exist in strips along buildings, along Santa Ana Court, and scattered throughout parking lots. Mature trees observed on site consist of coast redwood (*Sequoia sempervirens*), Shamel ash (*Fraxinus uhdei*), red ironbark (*Eucalyptus sideroxylon*), Monterey pine (*Pinus radiata*), Fremont cottonwood (*Populus fremontti*), and sweetgum (*Liquidambar styraciflua*). Smaller planted trees and shrubs include European white birch (*Betula pendula*), olive (*Olea europea*), and oleander (*Nerium oldeander*). English ivy (*Hedera helix*) is also common across the site. Other common non-native species such as annual grasses were not observed.

The closest riparian habitat is the Stevens Creek corridor, located 3.25 miles west of the Project site; and the Guadalupe River located 3.99 miles east of the Project site. The other closest natural habitats to the Project site are the tidal sloughs adjacent to the San Francisco Bay. Guadalupe Slough is located 2.65 miles north of the Project site. No wetlands, streams, ponds, vernal pools, marshes, or grasslands were observed on site or in the immediate vicinity.

Wildlife

Wildlife habitat within the Project site consists mainly of landscaped vegetation described above. However, the trees, shrubs, and grassy areas provide foraging, roosting, and nesting habitat for common, urban-adapted bird species such as house finch (*Haemorhous mexicanus*), California towhee (*Melozone crissalis*), spotted towhee (*Pipilo maculates*), Western scrub-jay (*Aphelocoma californica*), chesnut-backed chickadee (*Poecile rufescens*), dark-eyed junco (*Junco hyemalis*), American crow (*Corvus brachyrhynchos*), acorn woodpecker (*Melanerpes formicivorus*) and hummingbirds (*Calypte* species), which were all observed on site. Other avian species that might be present are raptors, which include red-tailed hawk (*Buteo jamaicensis)*, red-shouldered hawk

(*Buteo lineatus)*, Cooper's hawk (*Accipiter cooperii)*, osprey (*Pandion haliaetus*), and American kestrel (*Falco sparverius*). However, it is unlikely that raptors would be nesting on site due to various forms of disturbance including human activity, in addition to a general lack of nearby foraging habitat.

Even though the existing buildings are not abandoned, it is possible that bat species could use human-made structures attached to buildings for roosting sites. During the site reconnaissance, several awnings were observed, as well as crevices in between façade structures and the building to which they are attached. These features have the potential to provide roosting habitat for common bat species such as pallid bat (*Antrozous pallidus)*, hoary bat (*Lasiurus cinereus)*, big brown bat (*Eptesicus fuscus*), Yuma myotis (*Myotis yumanensis*), and Mexican free-tailed bat (*Tadarida brasiliensis*). However, these features are not considered ideal for roosting habitat as they are located adjacent to buildings that are in use and have regular human activity. Foliage of some of the mature trees on site might also provide roosting habitat for bats. Despite the fact that guano, staining, and other evidence of bat presence were not observed, an official survey conducted at the appropriate time of day is necessary to make a more concrete determination regarding bat presence.

Special-Status Wildlife and Plant Species

Sensitive wildlife species identified in the California Natural Diversity Database (CNDDB) as occurring in the Mountain View U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle, were considered to potentially occur on or near the Project site (see **Table 3.8-1**). The wildlife species identified in the CNDDB are pallid bat (*Antrozous pallidus)*, burrowing owl (*Athene cunicularia)*, western snowy plover (*Charadrius alexandrinus nivosus)*, northern harrier (*Circus cyaneus)*, snowy egret (*Egretta thula)*, saltmarsh common yellowthroat (*Geothlypis trichas sinuosa)*, hoary bat *(Lasiurus cinereus)*, California black rail *(Laterallus jamaicensis coturniculus)*, Alameda song sparrow (*Melospiza melodia pusillula*), California clapper rail (*Rallus longirostris*), salt marsh harvest mouse (*Reithrodontomys raviventris)*, salt marsh wandering shrew *(Sorex vagrans halicoetes)*, California least tern *(Sternula antillarum browni)*, and California brackishwater snail (*Tryonia imitator*) (CDFW, 2013). The documented occurrences for all of these wildlife species were located outside of the Project site in a variety of areas including sloughs of the South Bay, the Palo Alto Baylands Preserve, the former Moffett Field Naval Air Station, and the Palo Alto Municipal Airport, which are not in the immediate vicinity of the Project site. The only species that occurred in the City of Sunnyvale were California clapper rail and burrowing owl, and these sitings were located at least a mile away from the Project site. The closest siting to the Project area for California clapper rail was located approximately 5 miles north of the Project site and burrowing owls were located approximately 1.5 and 2 miles from the Project site (CDFW, 2013). The lack of habitat for these species precludes California clapper rail and burrowing owl (and all other CNDDB identified species) from occurring on the Project site, and unsuitable habitat in the vicinity combined with the lack of recent observations indicates these species are unlikely to occur near the Project site.

TABLE 3.8-1
POTENTIAL FOR SPECIAL-STATUS SPECIES OCCURRENCE

Name	Listing Status	Habitat Requirements	Occurrence	Potential for Species Occurrence Within the Survey Area
Birds				
Burrowing owl *(Athene cunicularia)*	CSC CDFW §3503.5	Open annual grasslands, desert, or scrublands with low vegetation. Relies on mammal burrows for nesting.	Western North America. In California they occur year round in the Central Valley, San Francisco Bay region, Carrizo Plain, and Imperial Valley.	**Absent**. Habitat not present on Project site.
Western snowy plover *(Charadrius alexandrinus nivosus)*	FT/CSC	Sandy beaches, salt pond levees and shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	California coast south to Baja California and Gulf coast.	**Absent**. Habitat not present on Project site.
Alameda song sparrow *(Melospiza melodia pusillula)*	CSC	Saline emergent wetlands in the south San Francisco Bay.	Endemic to California, specifically salt marshes around south San Francisco Bay.	**Absent**. Habitat not present on Project site.
Northern harrier (*Circus cyaneus*)	CSC CDFW §3503.5	Nests in salt or freshwater wetlands, forages over wetlands, annual grasslands.	Northern Alaska and Canada south to Baja California. Occurs locally in northwestern and northeastern California, as well as in the Central Valley, Central and southern coast, and southern deserts.	**Absent**. Habitat not present on Project site.
Snowy egret (Egretta thula)	*	Marshes, tidal-flats, streams, wet meadows, lake edges. Nests colonially usually near foraging sites. Rookeries protected.	Common egret across United States. Breeds and occurs year round in California.	**Absent**. Habitat not present on Project site.
Saltmarsh (San Francisco) common yellowthroat (*Geothlypis trichas sinuosa*)	FSC/CSC	Inhabits tidal salt and brackish marshes in winter, but breeds in freshwater brackish marshes and riparian woodlands during spring to early summer.	Endemic to California. Occurs specifically in coastal riparian zones and wetlands of western Marin County and San Mateo County and tidal marshes of San Pablo Bay and South San Francisco Bay.	**Absent**. Habitat not present on Project site.
California clapper rail (*Rallus longirostris obsoletus*)	FE/CE	Salt-water and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay. Associated with abundant growths of pickleweed, but feeds away from cover on invertebrates from mud-bottomed sloughs.	Endemic to San Francisco estuary.	**Absent**. Habitat not present on Project site.
California black rail (*Laterallus jamaicensis coturniculus*)	CT	Tidally influenced, heavily vegetated, high-elevation marshlands.	Occurs in the Sacramento-San Joaquin River delta, San Francisco Bay Area, Bolinas Lagoon, Tomales Bay, Morro Bay, White Slough in San Joaquin County, Salton Sea area.	**Absent**. Habitat not present on Project site.
California least tern *(Sternula antillarum* browni*)*	FE/CE	Colonial breeder on bare or sparsely vegetated flat substrates, including sand beaches, alkali flats, landfills, or paved areas.	Nesting range is from Southern Baja north to San Francisco Bay.	**Absent**. Habitat not present on Project site.
Red-shouldered hawk (*Buteo lineatus*)	CDFW §3503.5	Riparian and oak woodlands. Also found in eucalyptus groves and sometimes developed areas. Also found in suburban areas with mosaic of buildings and woodlands. Nest in broad-leaved trees near ponds or streams.	Widespread across western California and the United States.	**Low to moderate potential**. Common raptor. Could potentially be present because it is known to use developed areas, and eucalyptus trees are on site. However, the site and surrounding areas are highly urbanized and unlikely to support nesting birds.

TABLE 3.8-1 (Continued)
POTENTIAL FOR SPECIAL-STATUS SPECIES OCCURRENCE

Name	Listing Status	Habitat Requirements	Occurrence	Potential for Species Occurrence Within the Survey Area
Birds (cont.)				
Red-tailed hawk (*Buteo jamaicensis*)	CDFW §3503.5	Desert, scrublands, grasslands, roadsides, fields and pastures. Commonly found at field edges and perched on fences, poles, and trees.	Widespread across California and the United States.	**Low to moderate potential.** Common raptor. Open habitat exists on Project site and patches of open areas are in vicinity. Site and surrounding area is highly urbanized and unlikely to support nesting birds.
Cooper's hawk (*Accipiter cooperii*)	CDFW §3503.5	Forests, woodlands, and fields. Will also inhabit trees in suburban areas in parks and neighborhoods.	Widespread across California and the United States.	**Low to moderate potential.** Common raptor. Could potentially be present because it is known to use trees in parks and neighborhoods. On site habitat is unlikely to support nesting birds.
American kestrel (*Falco sparverius*)	CDFW §3503.5	Open areas such as meadows, grasslands, and open woodlands. Also utilize human modified habitat such as parks and fields.	Widespread across California and the United States.	**Low to moderate potential.** Common raptor. Specific habitat doesn't exist on site, but it could be present as there are parks nearby.
Mammals				
Pallid bat *(Antrozous pallidus)*	WBWG High	Grasslands, shrublands, woodlands, and forests. Common in arid regions with rocky outcroppings, particularly near water. Roosts in rock crevices, buildings, and under bridges and bark. Forages in open lowland areas, and forms large maternity colonies in the spring.	British Colombia to west Texas, Baja, and Central Mexico.	**Low to moderate potential.** Could potentially be present because it is known to roost in buildings and under bridges. Natural habitat doesn't exist on site and the existing building is not abandoned, however.
Hoary bat (*Lasiurus cinereus)*	WBWG Medium	Roosts in tree/shrub foliage. Prefers open habitat and habitat edges for foraging.	Has the most widespread distribution in North America. Common from Canada south to Central America.	**Low to moderate potential.** Could potentially be present because it uses buildings and other human-made structures as roosts. Could be present on site, but existing building is not abandoned.
Salt marsh wandering shrew (*Sorex vagrans halicoetes)*	CSC	Inhabits tidal salt marshes dense with pickleweed.	South San Francisco Bay.	**Absent.** Habitat not present on Project site
Salt marsh harvest mouse *(Reithrodontomys raviventris)*	FE/CE	Saline emergent marshlands with dense pickleweed.	Salt marshes along San Francisco Bay	**Absent.** Habitat not present on Project site.
Other Special-Status Species- Invertebrates				
Mimic Tryonia (California brackishwater snail) *(Tryonia imitator)*	*	Coastal lagoons, estuaries, and salt marshes.	Endemic to California. Occurs from Sonoma County south to San Diego County.	**Absent.** Habitat not present on Project site.
Plants				
Point Reyes bird's-beak *(Chloropyron maritimum* ssp. *palustre)*	CRPR 1B.2	Coastal salt marshes and swamps.	Occurs in California and Oregon.	**Absent.** Habitat not present on Project site.

TABLE 3.8-1 (Continued)
POTENTIAL FOR SPECIAL-STATUS SPECIES OCCURRENCE

Name	Listing Status	Habitat Requirements	Occurrence	Potential for Species Occurrence Within the Survey Area
Plants (cont.)				
Alkali milk-vetch (*Astragalus tener* var. *tener*)	CRPR 1B.2	Alkali playa, valley and foothill grassland, vernal pools.	Endemic to California. Occurs in Alameda, Solano, Napa, Yolo, and Merced County. Presumed extirpated from Contra Costa, San Francisco, Sonoma, Monterey, San Benito, Santa Clara, San Joaquin, and Stanislaus County.	**Absent.** Habitat not present on Project site.
Congdon's tarplant (*Centromadia parryi* ssp. *congdonii)*	CRPR 1B.1	Valley and foothill grassland.	Endemic to California. Occurs in Alameda, Contra Costa, San Mateo, Santa Clara, Monterey and San Luis Obispo County. Presumed extirpated from Santa Cruz and Solano County.	**Absent.** Habitat not present on Project site.
Hoover's button-celery (*Eryngium aristulatum* var. *hooveri)*	CRPR 1B.1	Vernal pools, wetland, roadside ditches, and wet areas near coast.	Endemic to California. Occurs in Alameda, Santa Clara, San Benito, San Luis Obispo, and San Diego County.	**Absent.** Habitat not present on Project site.
California seablite *(Suaeda californica)*	FE/ CRPR 1B.1	Coastal salt marshes and swamps.	Endemic to California; occurs only in Morro Bay and near Cayucos Point.	**Absent.** Habitat not present on Project site.

STATUS CODES:

FEDERAL: (U.S. Fish and Wildlife Service)
FT = Listed as Threatened (likely to become Endangered within the foreseeable future) by the Federal Government.
FSC = Federal Species of Concern

STATE: (California Department of Fish and Wildlife [CDFW])
CT = Listed as Threatened by the State of California
CSC = California Species of Special Concern
§3503.5 = California Fish and Game Code Section §3503.5
This code protects nesting raptors and birds of prey
*=Species listed on Special Animals list, CDFG, 2011

OTHER:

WBWG = Western Bat Working Group:
Low = Stable population
Medium = Need more information about the species, possible threats, and protective actions to implement.
High= Imperiled or at high risk of imperilment.

California Native Plant Society (CNPS) California Rare Plant Ranks (CRPR):
1A = Presumed extirpated in California; Rare or extinct in other parts of its range.
1B = Rare, threatened, or endangered throughout range; Most species in this rank are endemic to California.
2A = Extirpated in California, but common in other parts of its range.
2B = Rare, threatened, or endangered in California but common in other parts of its range.
3 = Need more information about species to assign it a ranking.
4 = Limited distribution and therefore warrants monitoring of status.
.1 = Seriously endangered in California
.2 = Fairly endangered in California

SOURCES: Bat Conservation International 2013; CDFW 2013; CNPS 2013; Cornell Lab of Ornithology 2013; Parsons and Master, 2000; Shuford and Gardali, 2008; Western Bat Working Group, 2013.

Sensitive plant species identified in the CNDDB as occurring in the Mountain View USGS 7.5-minute topographic quadrangle were considered to have the potential to occur on or near the Project site (see Table 3.8-1). These species are Hoover's button-celery (*Eryngium aristulatum* var. *hooveri)*, California seablite *(Suaeda californica)*, Point Reyes bird's-beak (*Chloropyron maritimum* ssp. *palustre*), alkali milk-vetch (*Astragalus tener* var. *tener*), and Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*) (CDFW, 2013). All siting locations occurred outside of the Project site, mainly in Palo Alto, Mountain View, and Cooley's Landing. As specific habitat requirements for these species, which includes coastal salt marshes, swamps, vernal pools, and wetlands, do not exist on the site, and suitable habitat in the immediate vicinity is non-existent. Therefore, these species are not likely to occur on or near the Project site.

Regulatory Setting

Federal

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) (16 USC, Sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs. For projects that would not result in the direct mortality of birds, the Migratory Bird Treaty Act is generally interpreted in CEQA analyses as protecting active nests of all species of birds that are included in the "List of Migratory Birds" published in the Federal Register in 1995.

State

California Fish and Game Code

Birds of prey are protected in California under the State Fish and Game Code, Section 3503.5 (1992). This code states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the California Department of Fish and Wildlife (CDFW). Typically CDFW recommends a 250-foot exclusion zone (buffer) around active passerine nests, and a 500-foot exclusion zone around active raptor nests. Any loss of fertile eggs, nesting raptors, or any activities resulting in nest abandonment would constitute a significant impact. Project impacts to these species would not be considered significant unless they are known or have a high potential to nest in the Project area or to rely on it for primary foraging.

All bat species are protected under the California Fish and Game Code Section 4150, which states that all non-game mammals or parts thereof may not be taken or possessed except as otherwise provided in the code or in accordance with regulations adopted by the commission.

Local

Sunnyvale General Plan

City-wide Vision Goals

III. *Environmental Sustainability*: To promote environmental sustainability and remediation in the planning and development of the City, in the design and operation of public and private buildings, in the transportation system, in the use of potable water and in the recycling of waste.

- **Policy LT-6.4:** Encourage sustainable industries that emphasize resource efficiency, environmental responsibility, and the prevention of pollution and waste.
- **Goal CC-3:** Well-designed sites and buildings - Private Development: Ensure that buildings and related site improvements for private development are well designed and compatible with surrounding properties and districts.
- **Policy CC-3.2:** Ensure site design is compatible with the natural and surrounding built environment.
- **Goal SN-l:** Acceptable Levels of Risk for Natural and Human-Caused Hazards - ensure that natural and human-caused hazards are recognized and considered in decisions affecting the community, and that land uses reflect acceptable levels of risk based on identified hazards and occupancy.

City of Sunnyvale Tree Ordinance

The City of Sunnyvale Tree Preservation Ordinance (Sunnyvale Municipal Code Chapter 19.94) states that it is unlawful to damage or remove any protected tree without a protected tree removal permit. Protected/significant trees are defined as:

- trees with a trunk size of 38 inches or larger in circumference that is 4.5 feet above ground (single trunk trees),
- or a multi-trunk tree with any trunk that is 38 inches or greater in circumference that is 4.5 feet above ground, or
- any multi-trunk tree with a cumulative trunk measurement of 113 inches or greater.

Other Regulated Resources

Wetland and aquatic habitats (rivers, streams, ponds, seasonal wetlands) are regulated by the U.S. Army Corps of Engineers and the Regional Water Quality Control Board. However, marshes, wetlands and aquatic habitat are not present on the Project site and therefore regulations regarding these biological resources do not apply.

Impacts and Mitigation Measures

Thresholds of Significance

For the purposes of this EIR, and based on Appendix G of the CEQA *Guidelines*, an impact related to biological resources is considered significant if implementation would:

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

Approach to Analysis

The following sources were reviewed for this analysis:

- CDFW, California Natural Diversity Database, data request for U.S. Geological Survey Mountain View 7.5-minute topographic quadrangle, information accessed August, 2013.
- City of Sunnyvale Municipal Code, Chapter 19.94
- Sunnyvale Landbank Technology Campus Biological Resources Report (H.T. Harvey and Associates, 2013)

As noted above, the Project site is currently developed and vegetation on-site consists of landscape trees and shrubs and other plants. The Project site thus provides limited habitat for wildlife and plant species. Special-status species and their associated habitats were not observed on-site during a reconnaissance survey performed by ESA on August 15, 2013. Therefore, the presence of candidate, sensitive, or special-status species is not expected and the Project is not expected to impact such species.

Potential impacts to nesting birds and roosting bats are identified and assessed based on the potential for such species to occur on site and proposed Project-related disturbance.

Based on the Project site and its geographical location, the Project would not result in impacts related to the following criteria. No impact discussion is provided for these topics for the following reasons:

- **Substantial Adverse Effect on Riparian habitat**. The Project area does not include riparian or sensitive natural communities as defined by the CDFW and the USFWS.
- **Substantial Adverse Effect on Federally Protected Wetlands**. The Project area does not contain any wetlands as defined by Section 404 of the Clean Water Act.
- **Interfere Substantially with the Movement of any Native Resident or Migratory Fish or Wildlife Species.** The Project area does not provide or connect to substantial wildlife habitat, and therefore migratory wildlife corridors do not occur within the site.
- **Conflict with the Provisions of an Adopted Habitat Conservation Plan**. The Project does not fall within any local, regional, or state habitat conservation plans or natural community conservation plans.

Impact Analysis

Impact BIO-1: Project construction could kill or injure special status birds at the Project site. (Significant)

Initial vegetation clearing activity associated with Project development, including tree removal, could result in the mortality of individual birds, including special-status birds such as red-shouldered hawk, red-tailed hawk, Cooper's hawk, or American kestrel, and/or destruction of nests and nestlings, if nests are present and occupied. This would be a significant impact because it could directly harm individuals and could threaten reproductive success. Therefore, the potential for the Project to result in bird mortality during Project development is considered a significant impact.

Mitigation Measures

Mitigation Measure BIO-1a: Avoidance. Initial site development activities, including vegetation clearing, shall be scheduled to avoid the nesting season. If Project activities are scheduled to take place outside the nesting season, all impacts to nesting birds would be avoided. The nesting season is considered to be from February 1 through August 31.

Mitigation Measure BIO-1b: Pre-construction/Pre-disturbance Surveys. If it is not possible to schedule vegetation clearing outside of the breeding season (between 1 September and 31 January), then pre-construction surveys for nesting birds shall be conducted by a qualified ornithologist to ensure that no nests will be disturbed or destroyed during Project implementation. Surveys shall be conducted no more than ten days prior to the initiation of Project activities. During the survey, the ornithologist will inspect all trees and other potential nesting habitats (e.g., trees, shrubs, and buildings) within and immediately adjacent to the impact areas for nests. If an active nest is found sufficiently

close to work areas to be disturbed by Project activities, the ornithologist will determine the extent of a work-free buffer zone to be established around the nest (typically 300-500 feet for raptors [i.e., hawks and owls] and 100-250 feet for songbirds) to ensure that no nests of species protected by the MBTA and California Fish and Game Code will be disturbed during Project implementation. The extent of the work-free buffer zone shall be determined by the ornithologist based on the species' sensitivity to disturbance (which can vary among species); the level of noise or construction disturbance; line of sight between the nest and disturbance; ambient noise levels; and consideration of other topographical or artificial barriers. Work-free buffer zones shall be maintained until after the breeding season or until after the qualified ornithologist determines the young have fledged (usually late June through mid-July).

Mitigation Measure BIO-1c: Inhibition of Nesting. If Project activities will not be initiated until after the start of the nesting season, then all potential nesting substrates (e.g., bushes, trees, grasses, and other vegetation, as well as buildings) that are scheduled to be removed shall be removed prior to the start of the nesting season (i.e., prior to 1 February). This will preclude the initiation of nests on these substrates, and minimize the potential for delay of the Project due to the presence of active nests.

Significance after Mitigation: *Less than Significant.* Mitigation Measure BIO-1a would itself mitigate this impact to a less-than-significant level. If it is not possible to implement Mitigation Measure BIO-1a comprehensively, then Mitigation Measures BIO-1b and BIO-1c would together ensure that direct impacts to nesting birds would be less than significant.

Impact BIO-2: The Project could result in increased bird collisions with buildings. (Significant)

Bird collisions with buildings has recently become a topic of concern. In 2014, the Sunnyvale City Council reviewed available information on possible causes of bird collisions and possible options to reduce the number of collisions. Throughout this process the City has worked to achieve a balance between the concern for bird-safe designs and the community goals. This balance is challenging given the relative lack of proven evidence of the impacts and causes for bird collisions with buildings and the principles of modern building design.

It is speculated that daytime collisions occur most often when birds fail to recognize window glass as a barrier. Regardless of overall height, the ground floor and first few stories (estimated to be the first 60 feet) of buildings present the greatest hazards to most birds. Reflections of attractive ground-level features like vegetation draw birds toward glass surfaces and which may result in collisions. Transparent features – especially buildings where birds can see through two glass surfaces to vegetation on the other side – also attract birds and cause collisions. The increased use of glass surfaces to provide more natural light to building interiors has exacerbated the problem to such an extent that some scientists believe bird mortality from building collisions can affect the viability of bird populations (Brown et al., 2007).

Some collisions appear to be induced by artificial night lighting, particularly from large buildings, which can be especially problematic for migrating songbirds since many are nocturnal migrants (Ogden, 1996). There is a concern that birds tend to move towards lights at night when migrating and then are reluctant to leave the sphere of light's influence. It has been suggested that structures located at key points along migratory routes may present a greater hazard than those at other locations (Ogden, 1996). Other research suggests that weather often plays an important part in increasing the risk of collisions, and that nights with heavy cloud cover and/or precipitation present the conditions most likely to result in high numbers of collisions (Ogden, 2002). The type of light used may affect its influence on the birds: for example, studies have indicated that blinking lights or strobe lights affect birds significantly less than non-blinking lights (Gauthreaux and Belser, 2006).

In order to address bird safety concerns, the City Council has adopted the Bird Safe Building Design Guidelines. The intent of the Guidelines is to reduce the risk of bird collisions in new construction. The Guidelines focus on building design issues based upon the location of the proposed building, and provide a set of tiered design requirements. A more stringent set of design requirements apply to sites within 300 feet of a body of water or that are adjacent to an open space or park area larger than one acre in size. A simpler set of requirements apply to other areas of the City considered to be lower risk for bird collisions. Both sets require developers to minimize reflective surfaces and glass walls, reduce night time lighting, discourage the placement of larger water features, and avoid landscape designs that emphasize tall landscaping adjacent to reflective surfaces.

Compliance with the City's Bird Safe Building Design Guidelines, which would be required for the Project, would reduce the potential for bird collisions; as a result, this impact would be less than significant.

Mitigation: None required.

Impact BIO-3: Project operations could have indirect adverse impacts on nesting special-status birds on site. (Less than Significant)

Project operations, including noise and activity associated with the proposed more intensive use of the Project site, could cause disturbance to nesting birds. Biologically, the disturbance of nesting birds is potentially significant because it could cause nest abandonment by special-status birds, which leaves nestlings vulnerable to predation and may lead to death, ultimately causing reproductive failure among breeding pairs within the Project site. However, birds choosing to nest within or adjacent to the Project site after the commencement of Project-related activities are considered to be habituated to such Project-related disturbance, and the impacts of Project operation would be less than significant.

Mitigation: None required.

Impact BIO-4: Project construction could kill or injure roosting and breeding bats. (Significant)

Although no bats or evidence of their presence was observed on the Project site, this does not rule out the possibility that bats occupy the site. Initial vegetation clearing activity associated with Project development could kill and/or injure, roosting and breeding special-status bats if roost sites occur in vegetation or buildings that will be removed. Direct impacts include the mortality of individual bats and/or destruction of maternal roosts and pups. These impacts would be significant because they could kill or injure adult and juvenile bats. The potential for the Project to result in bat mortality during Project construction is considered a significant impact.

Mitigation Measure

> **Mitigation Measure BIO-4: Pre-Construction Bat Surveys.** No more than two weeks in advance of tree removal or demolition of underutilized or vacant buildings on-site, a qualified bat biologist shall conduct pre-construction surveys for bat roosts. If a bat colony is located within the Project site during pre-construction surveys, the Project shall be redesigned to avoid impacts. A no-disturbance buffer of 100 feet shall be established around active bat roosts being used for maternity or hibernation purposes. If there is a maternity colony present and the Project cannot be redesigned to avoid removal of the tree or structure inhabited by the bats, demolition of that tree or structure shall not commence until after young are flying (i.e., after July 31, confirmed by a qualified bat biologist) or before maternity colonies form the following year (i.e. prior to March 1). Bat roosts initiated during construction are presumed to be unaffected, and no buffer would be necessary. However, the “take” of individuals is prohibited.
>
> **Significance after Mitigation:** ***Less than Significant.*** Mitigation Measure BIO-4 would ensure that direct impacts to bats would be less than significant.

Impact BIO-5: Project operations could have indirect adverse impacts on roosting and breeding bats on site. (Less than Significant)

Project operations would result in an intensification of use of the Project site, including likely increases in noise, traffic, and human activity, which could cause disturbance to bats. While it is uncertain that special-status bats are currently using the Project site, bats could establish roosts, including maternity roosts, in site trees and buildings during any stage of the Project in the future. If roosts are established on site after Project operations have begun, operation activity could disturb roosting bats. Disturbance to maternity roosts is particularly harmful if adults abandon their pups, which makes young vulnerable to predation and may lead to death, ultimately causing reproductive failure of colonies within the Project site. However, bats choosing to roost within or adjacent to the Project site after the commencement of Project-related activities are considered to be habituated to such Project-related disturbance, and thus impacts from Project operations would be less than significant.

Mitigation: None required.

Impact BIO-6: Project operations could have indirect adverse impacts on serpentine soils and associated special status species, through the process of nitrogen deposition. (Less than Significant)

Nitrogen deposition refers to the complex chemical process by which atmosphere-borne nitrogen compounds (such as nitrogen oxides, ammonia, and their reaction products) are added to the ground surface. Exhaust from the combustion of coal and petroleum products (such as diesel and gasoline) contributes nitrogen compounds to the atmosphere. When these compounds fall to the ground surface, they can enter the soil and affect the soil ecosystem (and overlying vegetation) by increasing soil acidity (which also causes a relative loss of other important plant nutrients from the soil) and by increasing nitrogen in the soil which favors those species of plants capable of surviving in a nitrogen-rich environment (Brooks, 1987).

Of particular concern in the Santa Clara Valley are soils derived from serpentinite, or serpentine soils, which tend to be deficient in plant nutrients and high in heavy metals. Certain native California plants, including many species considered rare, threatened or endangered, as well as host plants for endangered species of butterflies, have evolved to tolerate these soils. It has been observed that plants that occur predominantly on serpentine soils are unable to compete with other more nitrogen-responsive plants, including invasive non-native species. Other land cover types that occur in the region are also affected or potentially affected by nitrogen deposition.[1]

With increased nitrogen deposition in serpentine soils, it is possible that certain California native plants could be outcompeted by the growth of non-native nitrogen-responsive plants (Brooks, 1987). Furthermore, when non-native grasses outcompete native plants dependent on these serpentine soils, populations of larval host plants utilized by the rare Bay checkerspot butterfly (*Euphydryaa editha bayensis)* may be substantially reduced. Thus, nitrogen deposition on serpentine soils not only is detrimental to native plant species, but it also negatively affects the survival of rare animal species that rely on such native serpentine-associated plants (Weiss, 1999).

The Project site does not contain serpentine soils. The closest areas of serpentine soils are approximately 10 miles southeast of the Project site, as mapped in the Santa Clara Valley Habitat Plan. In Appendix E of the Habitat Plan, the simulations of nitrogen deposition indicate that nearly one-third (30%) of the nitrogen deposition is derived from mobile sources within about two miles of the habitat areas, 16% of the nitrogen deposition comes from other sources within about 12 miles of the habitat areas, and 17% of the deposition comes from the remainder of Santa

[1] According to the Santa Clara Valley Habitat Plan, land cover types known to be sensitive to nitrogen deposition are northern mixed and serpentine chaparral, northern coastal scrub, mixed oak woodland, foothill pine-oak woodland, mixed evergreen forest, and redwood forest. Land cover types that may be sensitive to nitrogen deposition are California annual grassland, valley oak woodland, blue oak woodland, coast live oak forest and woodland, freshwater marsh, seasonal wetland, and pond (Santa Clara County et al, 2012).

Clara County (Santa Clara County et al., 2012). The complete breakdown of simulated nitrogen deposition sources is shown in Figure E-27 of Appendix E of the Habitat Plan.

Project construction and operation are both expected to result in increased emissions of oxides of nitrogen (NOx), as described in Impacts AIR-1 and AIR-3 in Section 3.5, Air Quality. NOx emissions are associated with fossil fuel combustion, primarily from diesel-powered construction equipment used during Project construction and from passenger vehicles used by employees during Project operation. Thus, emissions would be concentrated at and proximate to the Project site, particularly during Project construction, although emissions would also occur throughout the Santa Clara Valley and the Bay region, associated with commuter trips during Project operation. However, these operational emissions would not be concentrated at any single location beyond the immediate Project vicinity. Accordingly, concentrated emissions of NOx from Project construction and operation would not occur in proximity to serpentine grasslands. It is expected that Project emissions, by themselves, would be too diffuse to have a substantial adverse impact on serpentine soils, and therefore the impact would be less than significant. The contribution of the Project to cumulative nitrogen deposition impacts on serpentine soils in the Santa Clara Valley is examined in the Cumulative Impact discussion in Chapter 4, Cumulative and Growth-Inducing Impacts.

Mitigation: None required.

Impact BIO-7: The Project could result in the removal of protected trees. (Less than Significant)

The City of Sunnyvale requires that a permit be obtained prior to any removal of protected trees. Protected trees are considered trees with a trunk size of 38 inches or larger in circumference that are 4.5 feet above ground, or a multi-trunk tree with any trunk that is 38 inches or greater in circumference that is 4.5 feet above ground (City of Sunnyvale, 2013). As stated in Chapter 2, Project Description, of the 210 protected “heritage” trees on site, the applicant proposes to remove 158 and retain 52. The applicant would need to submit an application for tree removal and comply with all applicable permit conditions, including replacement plantings, if required.

With adherence to the requirements of the City Municipal Code cited above, the Project would have a less-than-significant effect related to conflicts with local policies or ordinances protecting biological resources.

Mitigation: None required.

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3.9 Geology and Soils

Introduction

This section evaluates whether any element of the Project would result in increased exposure of people, structures, and/or the surrounding environment to geologic and seismic hazards, such as ground shaking, liquefaction, and accelerated erosion. This section describes the existing geologic setting; provides an overview of the applicable federal, State, and local regulatory framework; and presents an analysis of potential environmental impacts.

Environmental Setting

Regional and Site Geology

The Project site is located in the southern portion of the Coast Ranges geomorphic province, a series of northwest trending mountain ranges and valleys that stretch along the California coast from Santa Barbara north to the Oregon border (CGS, 2002). Topography in this province generally ranges from sea level along the shoreline to 6,000 feet above sea level at the highest peaks. Folding and faulting resulting from motion along the San Andreas Fault system is responsible for creating these mountain ranges.

Sunnyvale is located in the northwestern part of the Santa Clara Valley, at the south end of San Francisco Bay, on gravel, sand, silt and clay deposited by water over the last 1.6 million years or Quaternary time. These sediments were eroded from the older deformed sedimentary and metamorphic rocks which compose the Santa Cruz Mountains, to the west of Sunnyvale, which reach an elevation of nearly 3,300 feet above mean sea level (amsl) at the highest point. Rocks exposed in the Santa Cruz Mountains near Sunnyvale include Miocene-age marine shale (Monterey formation) and sandstone (Santa Clara formation) juxtaposed by the Adobe Creek Fault against lightly metamorphosed late Jurassic and Cretaceous seafloor basalt and sediments of the Franciscan complex (Dibblee and Minch, 2007; PES Environmental Inc., 2013).

The Quaternary-age deposits underlying Sunnyvale and the Project site are unconsolidated gravel, sand, silt, and clay emplaced by the action of streams flowing from the Santa Cruz Mountains into San Francisco Bay. According to the United States Geological Survey (USGS) *Mountain View, California* Quadrangle 7.5-minute series topographic map from 2012, the site is situated at approximately 50 feet amsl. The site is relatively flat, but the vicinity gently slopes to the north-northeast. The shoreline of San Francisco Bay is located approximately three miles north of the Project site.

Soils

The description of Project area soils is based on a review of soil surveys prepared by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) and the soil information collected as part of the geotechnical feasibility investigation report prepared for the

site. Soils in the vicinity of the Project area are called Urban Land (NRCS, 2013a). Soils classified as Urban Land units are paved areas or areas of highly disturbed land which display varying degrees of similarity to the soils that would form in those areas under undisturbed conditions. In this case, the soils within about 5 feet of the soil surface are disturbed fill with some similarity to soils that would be expected to form on unconsolidated alluvium (loose gravel, sand, silt, and clay deposited by the action of water).

Agricultural orchards were grown on the site from 1939 through 1956; by 1968 all the orchards had been cleared, and the current buildings were constructed on the site starting in 1976 (PES Environmental, 2013). Due to this construction the soils are likely highly disturbed. The soil in the Project vicinity is not prime farmland or farmland of statewide importance (NRCS, 2013b). Prime farmland is land which has the best combination of physical and chemical characteristics for the production of crops (Division of Land Resource Protection, undated). Farmland of statewide importance is land other than prime farmland which has a good combination of physical and chemical characteristics for the production of crops.

Because the surface soils consist of fill or highly disturbed soil, the NRCS did not assess the potential for concrete or steel corrosion characteristics for the soils underlying the Project site.

Seismicity

This section characterizes the region's existing faults, describes historic earthquakes, estimates the likelihood of future earthquakes, and describes the potential ground shaking effects. The primary sources of information for this section were publications prepared by the California Geological Survey (CGS) and the USGS.

Earthquake Terminology and Concepts

Earthquake Mechanisms and Fault Activity

Faults are planar features within the earth's crust that have formed to release strain caused by the dynamic movements of the earth's major tectonic plates. An earthquake on a fault is produced when these strains overcome the inherent strength of the earth's crust, and the rock ruptures. The rupture causes seismic waves to propagate through the earth's crust, producing the ground shaking effect known as an earthquake. The rupture also causes variable amounts of slip along the fault, which may or may not be visible at the earth's surface.

Geologists commonly use the age of offset rocks as evidence of fault activity—the younger the displaced rocks, the more recently earthquakes have occurred. To evaluate the likelihood that a fault would produce an earthquake, geologists examine the magnitude and frequency of recorded earthquakes and evidence of past displacement along a fault. An active fault is defined by the State of California as a fault that has had surface displacement within Holocene time (the last 11,000 years). A potentially active fault is defined as a fault that has shown evidence of surface displacement during the Quaternary period (the last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not mean that a fault lacking evidence of surface displacement is necessarily inactive. The term "sufficiently

active"[1] is also used to describe a fault if there is some evidence that Holocene displacement has occurred on one or more of its segments or branches (Bryant and Hart, 2007).

For the purpose of delineating fault rupture zones, the CGS historically sought to zone faults defined as potentially active, which are faults that have shown evidence of surface displacement during the Quaternary period (the last 1.6 million years). However, usage of that term under the Alquist-Priolo Earthquake Fault Zoning Act was discontinued when it became apparent that the sheer number of Quaternary-age faults in the state made it meaningless to zone all of them (Bryant and Hart, 2007). In late 1975, the State geologist made a policy decision to zone only those faults that had a relatively high potential for ground rupture, determining that a fault should be considered for zoning as active only if it was sufficiently active and "well defined."[2] Blind faults do not show surface evidence of past earthquakes, even if they occurred in the recent past; and faults that are confined to pre-Quaternary rocks (more than 1.6 million years old) are considered inactive and incapable of generating an earthquake.

Although it is difficult to quantify the probability that an earthquake will occur on a specific fault, this classification is based on the assumption that if a fault has moved during the last 11,000 years, it is likely to produce earthquakes in the future. As noted above, the term Potentially Active, previously used to describe faults that show geologic evidence of movement between 11,000 and 1.6 million years ago, is no longer used by the CGS, but the term does still appear on older reports and maps. In addition, potentially active faults are sometimes referred to as Quaternary faults.

Earthquake Magnitude

When an earthquake occurs along a fault, its size can be determined by measuring the energy released during the event. A network of seismographs records the amplitude and frequency of the seismic waves that an earthquake generates. The Richter Magnitude (M) of an earthquake represents the highest amplitude measured by the seismograph at a distance of 100 kilometers from the epicenter. Richter magnitudes vary logarithmically with each whole number step representing a ten-fold increase in the amplitude of the recorded seismic waves and 32 times the amount of energy released. While Richter Magnitude was historically the primary measure of earthquake magnitude, seismologists now use Moment Magnitude as the preferred way to express the size of an earthquake. The Moment Magnitude scale (Mw) is related to the physical characteristics of a fault, including the rigidity of the rock, the size of fault rupture, and the style of movement or displacement across the fault. Although the formulae of the scales are different, they both contain a similar continuum of magnitude values, except that Mw can reliably measure larger earthquakes and do so from greater distances.

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1 A fault is deemed sufficiently active if there is evidence of Holocene surface displacement along one or more of its segments or branches.

2 A fault is considered well defined if its trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The fault may be identified by direct observation or by indirect methods (e.g., geomorphic and geophysical evidence). The critical consideration is that the fault, or some part of it, can be located in the field with sufficient precision and confidence to indicate that the required site-specific investigations would meet with some success.

Peak Ground Acceleration

A common measure of ground motion at any particular site during an earthquake is the peak ground acceleration (PGA). The PGA for a given component of motion is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g), which is approximately 980 centimeters per second squared. In terms of automobile accelerations, one "g" of acceleration is equivalent to the motion of a car traveling 328 feet from rest in 4.5 seconds. For comparison purposes, the maximum PGA value recorded during the Loma Prieta earthquake was in the vicinity of the epicenter, near Santa Cruz, and was 0.64g. Unlike measures of magnitude, which provide a single measure of earthquake energy, PGA varies from place to place, and is dependent on the distance from the epicenter and the character of the underlying geology (e.g., hard bedrock, soft sediments, or artificial fills).

The Modified Mercalli Intensity Scale

The Modified Mercalli Intensity Scale (MMI) (**Table 3.9-1**) assigns an intensity value based on the observed effects of ground shaking produced by an earthquake. Unlike measures of earthquake magnitude and PGA, the Modified Mercalli (MM) intensity scale is qualitative in nature, which means that it is based on actual observed effects rather than measured values. Similar to PGA, MM intensity values for an earthquake at any one place can vary depending on its magnitude, the distance from its epicenter, the focus its energy, and the type of geologic material. The MM values for intensity range from I (earthquake not felt) to XII (damage nearly total), and intensities ranging from IV to X could cause moderate to major structural damage. Because the MM is a measure of ground shaking effects, intensity values can be related to a range of average PGA values, also shown in Table 3.9-1.

Seismic Context

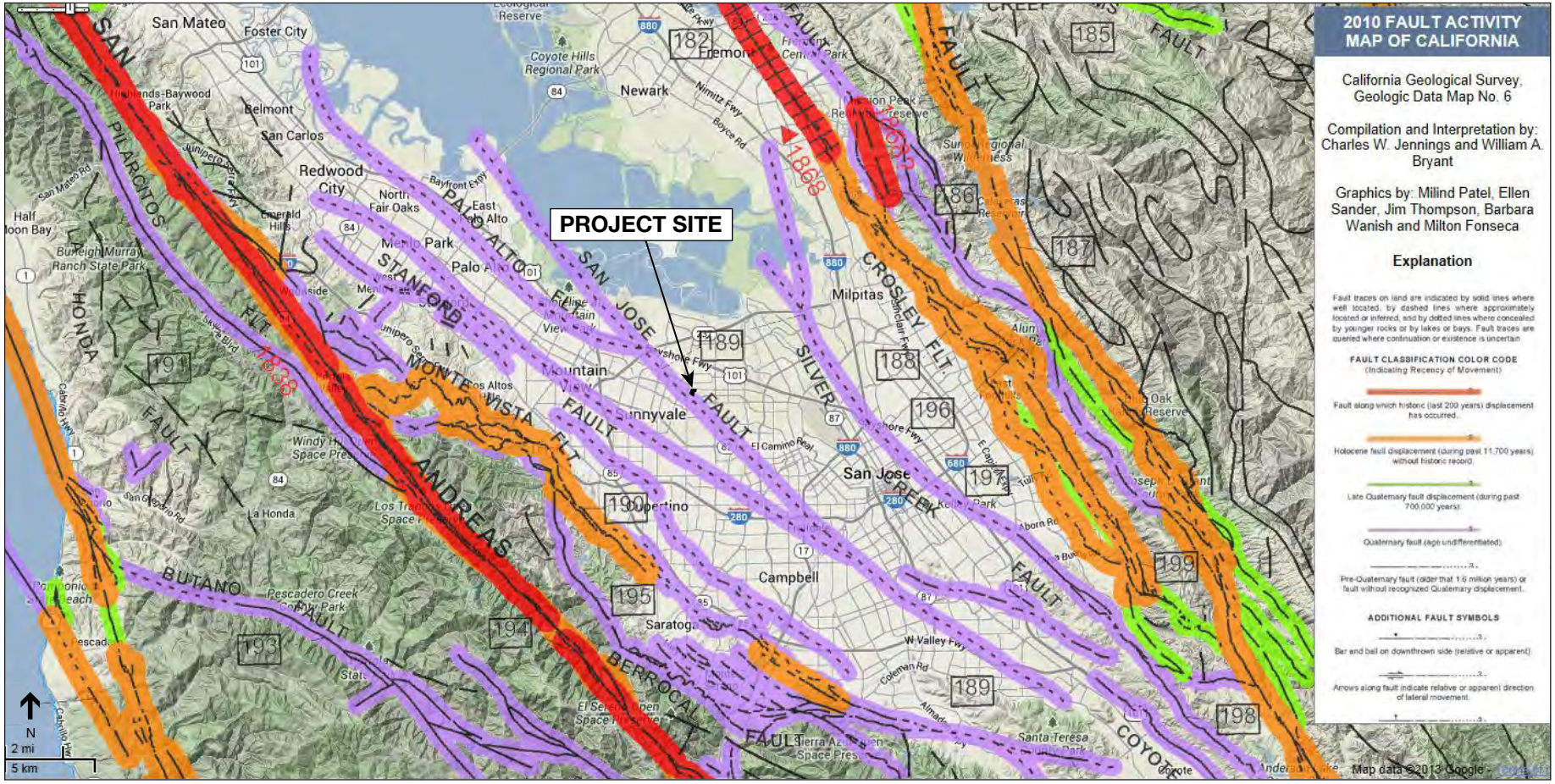
The Project Area lies within a region of California that contains many active and potentially active faults and is considered an area of high seismic activity (**Figure 3.9-1**). The USGS, the CGS, and the Southern California Earthquake Center formed the 2007 Working Group on California Earthquake Probabilities to summarize the probability of one or more earthquakes of magnitude 6.7 or higher occurring in the state of California over the next 30 years. Accounting for the wide range of possible earthquake sources, it is estimated that the Bay Area as a whole has a 63% chance of experiencing an earthquake of magnitude 6.7 or higher before 2036 (USGS, 2008a). According to the working group, the individual faults posing the greatest threat to the Bay Area are the Hayward-Rodger's Creek Fault and the San Andreas Fault. Other principal faults capable of producing large earthquakes in the Bay Area include the Calaveras, Concord–Green Valley, Marsh Creek–Greenville, and the San Gregorio faults. **Table 3.9-2** lists active faults located within 30 miles of the Project Area, their distance and direction from the Project Area, their maximum moment magnitude earthquake, and the probability that they will generate a major earthquake.

TABLE 3.9-1
MODIFIED MERCALLI INTENSITY SCALE

Intensity Value	Intensity Description	Average Peak Acceleration[1]
I	Not felt except by a very few under especially favorable circumstances.	<0.0017g
II	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.	<0.014g
III	Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration like passing of truck. Duration estimated.	<0.014g
IV	During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.	0.014-0.039g
V	Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.	0.039-0.092g
VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.	0.092-0.18g
VII	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.	0.18-0.34g
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.	0.34-0.65g
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.	0.65-1.24g
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.	>1.24g
XI	Few, if any, (masonry) structures remain standing. Bridges destroyed. Board fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	>1.24g
XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.	>1.24g

NOTE:
[1] g (gravity) = 580 centimeters per second squared. 1.0 g of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

SOURCE: USGS, 2011; ABAG, 2013.



SOURCE: Jennings and Bryant, 2010

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Figure 3.9-1
Fault Activity

TABLE 3.9-2
FAULTS IN THE PROJECT SITE VICINITY

Fault	Minimum Distance and Direction from Project site	Most Recent Deformation	Fault Classification	Historic Earthquakes > M 6.5[a]	Maximum Moment Magnitude Earthquake (Mw)[b]	Future Earthquake Probability[c]
Monte Vista-Shannon Fault	5.7 miles southwest	Holocene (<11,700 years)	Quaternary	None	-	9%
Hayward Fault (Southern Section)	8.2 miles northeast	Historic (<150 years)	Active	M 6.8, 1868 M 6.75, 1838	6.7	31 %
San Andreas Fault (Peninsula Section)	9 miles southwest	Historic (<150 years)	Active	M 7.1, 1989 M 8.25, 1906 M 6.5, 1865 M 7.0, 1838	7.1	21%
Calaveras Fault (Central Section)	17.2 miles east-northeast	Historic (<150 years)	Active	M 6.5, 1911	6.2	7 %
San Gregorio Fault (San Gregorio Section)	23.4 miles southwest	Latest Quaternary (<15,000 years)	Active	None	7.2	6 %
Greenville Fault (Arroyo Mocho Section)	27.2 miles east-northeast	Latest Quaternary (<15,000 years)	Quaternary	None	-	9%

[a] From Bryant and Cluett, 2002. Historic earthquakes listed may have occurred along any portion of the fault (and not necessarily the fault section closest to the Project area).
[b] The Maximum Moment Magnitude Earthquake is derived from the joint California Division of Mines and Geology (CDMG) / USGS Probabilistic Seismic Hazard Assessment for the State of California (Peterson et al., 1996) and associated updates (Cao *et al*,. 2003)
[c] Probability of one or more earthquakes of magnitude 6.7 or greater from 2007 to 2036 provided by the USGS (2008a). The Working Group estimates the probability of a "background" earthquake not from one of the seven major faults studied to be 9%.

SOURCES: Bryant and Cluett, 2002; USGS, 2008b; Peterson et al., 1996.

Local Faults

The active faults in the vicinity of the Project Area with the greatest probability of generating a large earthquake before 2036 are the northwest-trending San Andreas and Hayward Faults, located approximately 9 miles southwest and 8 miles northeast of the Project Area, respectively (Figure 3.9-1).

The faults shown in Figure 3.9-1 are categorized by age, which is used as a proxy for potential fault activity. Faults that display evidence of surface rupture (fault activity) within the Holocene are considered active for public safety purposes in California; older faults are also shown on the map but have much lower potential for surface rupture. Red and orange lines on the map highlight active faults, green lines indicate faults which have not moved within the last 700,000 years, and purple lines indicate faults which have not moved since before 700,000 years ago. Green and purple faults have a very low potential for surface rupture, and are not analyzed in this report because the threat they pose to public safety is considered minimal.

The San Andreas Fault juxtaposes the Mindego Hill assemblage[3] on the southwest against the Woodside assemblage (which includes the bedrock units underlying the Project Area), on the northeast. The San Andreas Fault is a right-lateral strike-slip[4] fault with an estimated displacement of about 22 miles over the last 8 million years (CGS, 2002). The San Andreas Fault includes many individual fault strands in a zone that ranges in width from several hundred to more than 1,000 feet. The San Andreas Fault has experienced several large earthquakes in historic time, including the Great 1906 San Francisco Earthquake (Mw 7.9) and the 1989 Loma Prieta Earthquake (Mw 6.9). The USGS estimates a 21% chance that the San Andreas Fault could generate a Mw 6.7 earthquake or greater before 2036 (USGS, 2008a).

The Hayward Fault, part of the San Andreas Fault System, is also a right-lateral strike-slip fault, and is located along the eastern margin of the San Francisco Bay extending from eastern San Jose north to San Pablo Bay. The northern portion of the fault probably connects with the Rodgers Creek Fault in Sonoma County (Bryant and Cluett, 2002). The fault blocks on either side of the Hayward Fault move past each other at a nearly-steady rate of approximately 5 mm per year (USGS, 2008b). This fault creep[5] has historically been punctuated by earthquakes, however, such as the powerful M 6.8 earthquake in 1868. The USGS estimates a 31% chance that the Hayward-Rogers Creek Fault could generate an earthquake of Mw 6.7 or greater before 2036 (USGS, 2008a).

Geologic Hazards

This section discusses the hazards and/or adverse conditions that are associated with the geologic setting of the site.

Areas that are most susceptible to landslides are steep slopes in poorly cemented or highly fractured rocks, areas underlain by loose, weak soils, and areas on or adjacent to existing landslide deposits (CGS, 2006). There are no records of landslides, either induced by earthquakes or by sudden soil saturation, occurring on the Project site. For this reason, the hazard posed by landslides to the Project is not further discussed here.

Expansive Soils

Expansive soils exhibit “shrink-swell” behavior, also called linear extensibility. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained sediments or soils from the process of wetting and drying. Expansive soils can undergo substantial volume change if the moisture content of the soil changes. This shrink-swell action can damage building foundations, roads, and other structures. Moderately to highly expansive soils generally cover the entire Project site, and are present in subterranean soil layers as well (Cornerstone Earth Group, 2013).

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3 An assemblage is a group of rocks that are closely related on a regional and/or stratigraphic basis. Neighboring assemblages contain grouped bedrock units that differ in terms of their depositional and deformational history.

4 Rocks on either side of a strike-slip fault move parallel to the fault’s trace (i.e., side-by-side). When movement along a strike-slip fault is right-lateral, displacement along the fault is such that, in plan view, the side opposite the observer appears displaced to the right.

5 Creep is steady fault movement, varying from continuous to episodic with creep events lasting minutes to days.

Seismic Hazards

The hazards and/or adverse conditions that are often associated with the seismic setting of the Project sites in the Bay Area are discussed in this section.

Surface Fault Rupture

Seismically-induced surface fault rupture is defined as the rapid physical displacement of surface deposits in response to movement of the ground on one side of a fault relative to the other side, in conjunction with an earthquake. The magnitude, sense, and nature of fault rupture can vary for different faults or even along different strands of the same fault. Ground rupture is considered more likely along active faults. (Active faults within the vicinity of the Project Area are referenced in Figure 3.9-1 and Table 3.9-2.) The Project site is not within an Alquist-Priolo Fault Rupture Hazard Zone, as designated by the California Alquist-Priolo Earthquake Fault Zoning Act (Bryant and Hart, 2007).

Ground Shaking

As discussed above, a major earthquake is likely to produce strong ground shaking effects anywhere within the region at some time during the next 30 years. Earthquakes on active or potentially active faults, depending on their magnitude and distance from the Project Area, could produce a wide range of ground shaking intensities in the Project Area. Historically, earthquakes have caused strong ground shaking and damage in the San Francisco Bay Area, the most recent being the moment magnitude 6.9 Loma Prieta earthquake in October 1989. The Loma Prieta earthquake is estimated to have caused strong (MMI-VII) shaking intensities at the site with the epicenter located approximately 18 miles to the south (ABAG, 2010). The areas that experienced higher ground shaking intensities were those underlain by thick sequences of alluvium or colluvium on valley floors, which tend to amplify the longer wavelengths of ground shaking.

A future worst-case scenario for a regional earthquake in the vicinity of the Project site would be a large seismic event originating on the Peninsula segment of the San Andreas Fault. It is estimated that a characteristic earthquake[6] (M 7.2) that the Peninsula segment of the San Andreas Fault would produce would result in very strong (MMI-VIII) ground shaking intensities, depending on the nature of the underlying soil (ABAG, 2010). Representative intensity descriptions used to illustrate the extent of damage possible under various ground shaking intensities are provided in Table 3.9-1.

The primary tool that seismologists use to describe ground shaking hazard is a Probabilistic Seismic Hazard Assessment (PSHA). The PSHA for the State of California takes into consideration the range of possible earthquake sources (including such worse-case scenarios as described above) and estimates their characteristic magnitudes to generate a probability map for ground shaking. The PSHA maps depict values of PGA that have a 10% probability of being exceeded in 50 years. Use of this probability level allows engineers to design structures to

6 The concept of “characteristic” earthquakes means that we can anticipate, with reasonable certainty, the actual damaging earthquakes that will occur on a fault segment (Peterson et al., 1996).

withstand ground motions that have a 90% chance of not occurring in the next 50 years, making buildings safer than if they were merely designed for the most probable events. The PSHA indicates that at the Project site, there is a 10% chance of exceeding PGA values of approximately 0.55g over the next 50 years (a 1 in 475 chance of occurring) (CGS, 2006).

The composition of underlying soils, even those relatively distant from faults, can intensify ground shaking. One contributor to the site amplification is the velocity at which the soil transmits shear waves. Shaking is stronger where the shear wave velocity is lower. The National Earthquake Hazards Reduction Program (NEHRP) has defined five soil types based on their shear wave velocity, which the USGS has modified slightly based on studies of earthquake damage in the Bay Area (USGS, 2012) (**Table 3.9-3**).

TABLE 3.9-3
MODIFIED NATIONAL EARTHQUAKE HAZARD REDUCTION PROGRAM (NEHRP) SOIL CLASSIFICATIONS

Soil Classification	Shear-Wave Velocity (Vs)	Soil Description
Soil Type A	Vs > 1500 meters/second	Includes unweathered intrusive igneous rock. Occurs infrequently in the Bay Area. Considered with Type B. Soil types A and B do not contribute greatly to shaking amplification.
Soil Type B	1500 meters/second > Vs > 750 meters/second	Includes volcanic, mostly Mesozoic bedrock, and some Franciscan bedrock. (Mesozoic rocks are between 245 and 64 million years old. The Franciscan Complex is a Mesozoic unit that is common in the Bay Area.)
Soil Type C	750 meters/second > Vs > 350 meters/second	Includes some Quaternary (less than 1.8 million years old) sands, sandstones, and mudstones; some Upper Tertiary (1.8 to 24 million years old) sandstones, mudstones, and limestones; some Lower Tertiary (24 to 64 million years old) mudstones, and sandstones; and Franciscan mélange and serpentinite.
Soil Type D[a]	350 meters/second > Vs > 200 meters/second	Includes some Quaternary muds, sands, gravels, silts, and other muds. Significant amplification of shaking by these soils is generally expected.
Soil Type E	200 meters/second > Vs	Includes water-saturated mud and artificial fill. The strongest amplification of shaking is expected for this soil type.

NOTE:
[a] As described in the text, the soil underlying the Project site is modified NEHRP Soil Type D.

SOURCE: USGS, 2012

The geotechnical feasibility investigation determined that the shear wave velocities for soils under the Project site fall within the range classified as Soil Type D on the modified NEHRP scale (Cornerstone Earth Group, 2013). Soils of Type D are expected to substantially amplify shaking.

Liquefaction

Liquefaction is a transformation of soil from a solid to a liquefied state during which saturated soil temporarily loses strength resulting from the buildup of excess pore water pressure, especially during earthquake-induced cyclic loading caused by the arrivals of seismic waves. Soils that are

susceptible to liquefaction include loose to medium dense sand and gravel, low-plasticity silt, and some low-plasticity clay deposits. Ground failure can occur when liquefaction occurs in layers of sediment underlying a site. Soil liquefaction and associated ground failure can damage roads, pipelines, underground cables, and buildings with shallow foundations. Liquefaction can occur in areas characterized by water-saturated, cohesionless, granular materials at depths less than 40 feet. Soil that liquefies can manifest a number of failures, including lateral spreading, rapid settlement and flow slides. Mapping by the USGS has determined that the Project Area is moderately susceptible to liquefaction (Witter et al., 2006). The site is also in a Santa Clara County Liquefaction Hazard Zone (Cornerstone Earth Group, 2013). Several saturated sand layers were encountered during the geotechnical feasibility investigation, indicating these layers could experience liquefaction (Cornerstone Earth Group, 2013).

Seismically-Induced Landslides

No previous seismically-induced landslides have been observed near the Project area (CGS, 2006). Due to the low-relief topography and type of material present at the Project site, lateral spreading is the primary type of landslide that could occur during or after an earthquake. Lateral spreading is horizontal/lateral ground movement of relatively flat-lying soil deposits towards a free face such as an excavation, channel, or open body of water, and is usually associated with liquefaction of subsurface layers (Cornerstone Earth Group, 2013). Potential for lateral spreading at the Project site is low, as there are no open faces within a sufficient distance of the site where lateral spreading would occur (Cornerstone Earth Group, 2013).

Earthquake-Induced Settlement

The Project site could experience liquefaction-induced settlement in the event of an earthquake because liquefiable layers were identified below the site in the geotechnical feasibility investigation. Differential settlement on the order of 0.5 to 1 inch could occur across the site if the identified layers do liquefy during an earthquake (Cornerstone Earth Group, 2013). However, earthquake-induced settlement of the unsaturated soil at the Project site is not expected due to the high clay content and dense sand in the soils (Cornerstone Earth Group, 2013).

Regulatory Framework

The following section provides a brief summary of the State and local regulations, goals and policies that apply to the Project.

State Regulations

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to protect structures for human occupancy from the hazard of surface faulting. In accordance with this act, the State Geologist established regulatory zones - called earthquake fault zones - around the surface traces of active faults, and has published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. Each earthquake

fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace because many active faults are complex and consist of more than one branch that may experience ground surface rupture. The Alquist-Priolo Act does not apply to the Project because no active faults cross the Project components.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was passed in 1990 following the Loma Prieta earthquake to reduce threats to public health and safety and to minimize property damage caused by earthquakes. The act directs the Department of Conservation to identify and map areas prone to the earthquake hazards of liquefaction, earthquake-induced landslides, and amplified groundshaking. For structures intended for human occupancy, the act requires site-specific geotechnical investigations to identify potential seismic hazards and formulate mitigation measures prior to permitting most developments designed for human occupancy within the Zones of Required Investigation. The Project lies within a designated Zone of Required Investigation and includes construction of buildings intended for human occupancy, which means that a site-specific investigation of the potential seismic hazard must be performed.

California Building Code

The California Building Code (CBC) has been codified in the California Code of Regulations (CCR) as Title 24, Part 2. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under State law, all building standards must be centralized in Title 24 to be enforceable. The purpose of the CBC is to establish minimum standards to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction.

The CBC is a compilation of three types of build standards from three different origins:

- Building standards that have been adopted by state agencies without change from building standards contained in national model codes
- Building standards that have been adopted and adapted from the national model code standards to meet California conditions
- Building standards, authorized by the California legislature, that constitute extensive additions not covered by the model codes that have been adopted to address particular California concerns.

The 2013 edition of the CBC is based on the 2012 International Building Code (IBC) published by the International Code Council. The 2013 edition of the CBC was published by the California Building Standards Commission in July, 2013, and will take effect starting January 1, 2014. The 2013 CBC contains California amendments based on the American Society of Civil Engineers (ASCE) Minimum Design Standard 7. ASCE 7, *Minimum Design Loads for Buildings and Other Structures*, provides requirements for general structural design and includes means for

determining earthquake loads as well as other loads (such as wind loads) for inclusion into building codes. The provisions of the CBC apply to the construction, alteration, use and occupancy, location, maintenance, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

California Occupational Safety and Health Administration Regulations

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the work place. In California, the California Division of Occupational Safety and Health (Cal/OSHA) and the federal OSHA are the agencies responsible for ensuring worker safety in the workplace.

The OSHA Excavation and Trenching standard (29 CFR 1926.650) covers requirements for excavation and trenching operations, which are among the most hazardous construction activities. OSHA requires that all excavations in which employees could potentially be exposed to cave-ins be protected by sloping or benching the sides of the excavation, supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area. Cal/OSHA is the implementing agency for both state and federal OSHA standards.

NPDES Construction General Stormwater Permit

The Regional Water Quality Control Board (RWQCB) administers the National Pollutant Discharge Elimination System (NPDES) stormwater permitting program in the Central Coast region. Construction activities disturbing one acre or more of land are subject to the permitting requirements of the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (Construction General Permit) and must apply for Construction General Permit coverage. For all new projects, applicants must electronically file permit registration documents using the Stormwater Multiple Applications and Report Tracking Systems (SMARTS), and must include a Notice of Intent, risk assessment, site map, and Storm Water Pollution Prevention Plan (SWPPP) to be covered by the General Construction Permit prior to beginning construction. The risk assessment and SWPPP must be prepared by a State-qualified SWPPP Developer.

The Construction General Permit requires that the site be assigned a risk level of 1 (low), 2 (medium), or 3 (high) based on sediment and receiving waters risk. The sediment risk level is the relative amount of sediment that can be discharged given the project and location details. The receiving waters risk level reflects the risk sediment discharges poses to the receiving waters. A construction analysis provides a preliminary risk level assessment.

The Construction General Permit requires the preparation and implementation of a SWPPP, which must be prepared before construction begins. The SWPPP provides specific construction-related best management practices (BMPs) to prevent soil erosion and loss of topsoil. BMPs implemented could include, but would not be limited to, physical barriers to prevent erosion and sedimentation, construction of sedimentation basins, limitations on work periods during storm events, use of swales, protection of stockpiled materials, and a variety of other measures that would substantially reduce or prevent erosion from occurring during construction.

Local Plans and Policies

City of Sunnyvale General Plan

The City of Sunnyvale General Plan includes the following policy related to seismic hazards:

- ***Policy SN-1.1*:** Evaluate and consider existing and potential hazards in developing land use policies. Make land use decisions based on an awareness of the hazards and potential hazards for the specific parcel of land.

The General Plan also states that geotechnical reports are required for all developments in the City of Sunnyvale.

Impacts and Mitigation Measures

Significance Criteria

Consistent with Appendix G of the CEQA *Guidelines*, the Project would have a significant impact to geology, soils, and seismicity if it would:

- Expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
  - Strong seismic ground shaking;
  - Seismic-related ground failure, including liquefaction; and/or
  - Landslides;
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

Approach to Analysis

This section identifies the geologic and seismic impacts associated with the proposed Project. The Project was evaluated against existing (2013) conditions to determine whether geologic or seismic effects would trigger any significant impacts based on the identified significance criteria. This section also identifies impacts that are less than significant.

The geotechnical feasibility investigation completed for this Project provides enough information about the geologic and seismic hazards present on site for purposes of analyzing impacts in the EIR, but is not intended for site-specific construction design. The foundation system for each of the three buildings and parking structure at the Project site must be designed in accordance with the site-specific engineering properties of the materials beneath the proposed structures, combined with the intended loading (weight) of the proposed structures. These design criteria can only be developed with information obtained from a site-specific geotechnical investigation conducted according to the requirements defined in the relevant regulations. Once appropriately designed and subsequently constructed in accordance with local and State building code requirements, the structures would have the structural fortitude to withstand anticipated seismic hazards without substantial damage.

Based on the location and characteristics of the Project, the following significance criteria are not considered potential impacts and are not addressed further for the reasons described below:

- **Septic Tanks or Alternative Wastewater Disposal Systems**: The Project does not include the installation of septic tanks or the use of alternative wastewater disposal systems. For this reason, the ability of site soils to support the use of septic tanks or alternative water disposal systems is not further evaluated in this EIR.
- **Landslides:** The Project site is essentially flat, and is therefore not subject to landslides.

Impact Analysis

Impact GEO-1: Surface rupture during an earthquake fault could expose people or structures at the Project site to loss, injury, or death. (Less than Significant)

Surface rupture occurs when movement along a fault breaks through the ground surface, and generally occurs along preexisting faults, which are zones of weakness in the earth's crust. Not all earthquakes result in surface rupture. To prevent the construction of buildings used for human occupancy in places where surface rupture poses a threat the structures, the Alquist-Priolo Earthquake Fault Zoning Act was passed in California, which requires the State Geologist to establish regulatory zones around surface traces of active faults. These zones vary in width, but average about one-quarter mile wide.

While it is possible that surface rupture could occur outside of these zones, the risk of occurrence is not substantial. The Project site is not within a mapped Alquist-Priolo Earthquake Fault Zone, therefore the extent to which the Project would expose people or structures to impacts involving rupture of a known earthquake fault is less than significant.

Mitigation: None required.

Impact GEO-2: Large earthquakes could damage the proposed buildings, impairing and/or disrupting their intended operations. (Less than Significant)

The Project site, like the Bay Area as a whole, will likely experience at least one major earthquake (M 6.7 or higher) within the next 20 years. The intensity of such an event would depend on the causative fault and the distance to the epicenter, the depth of the rupture below ground surface, the composition of underlying soils, and the duration of shaking. As seen with damage in San Francisco and Oakland due to the 1989 Loma Prieta earthquake, centered about 50 miles south of San Francisco, extensive damage can occur at considerable distances to the epicenter of a large earthquake. Higher levels of shaking damage would be expected for earthquakes occurring at closer distances. In addition, the soil type at the Project site could amplify waves generated at these nearby faults. Seismic hazard mapping for the site indicates that very strong (MMI VIII) ground shaking and peak ground accelerations of 0.55g would potentially occur at the Project site.

The Project could increase the exposure of people and structures to adverse effects of seismic ground shaking because the Project would result in new, multi-story buildings on the site. Currently the Project site is occupied by several single-story buildings. The Project would develop three six-story buildings and a parking garage on the Project site, which would increase the number of people potentially on site during strong seismic ground shaking. However, as described below, the Project would be developed in compliance with current seismic standards, which are more stringent than those governing the existing buildings on the site, thereby minimizing risk of seismically induced damage.

Modern standard engineering and construction practices include design criteria to mitigate potential damage from an earthquake. As a part of the Project, a California licensed geotechnical engineer or engineering geologist would conduct geotechnical investigations for all Project components prior to the final design and prepare recommendations applicable to foundation design, earthwork, backfill and site preparation prior to or during the Project design phase. The investigations would specify seismic and geologic hazards including potential ground movements and co-seismic effects (e.g., liquefaction). The recommendations of the geotechnical engineer would be incorporated into the design and specifications in accordance with California Geological Survey Special Publication 117A and would be implemented by the construction contractor. The construction manager would conduct inspections and certify that all design criteria have been met in accordance with the California Building Code, as well as applicable City ordinances. While these practices would not completely eliminate the potential for damage to the facilities, they would ensure that the resultant improvements would have the structural fortitude to withstand anticipated ground shaking and seismically induced ground failures without significant damage.

With compliance with applicable construction requirements in the CBC, City codes, and the design criteria from the geotechnical engineer or engineering geologist, effects of earthquake-caused damage on the proposed Project and Project occupants would be reduced to the maximum feasible degree, and this impact would be less than significant.

Mitigation: None required.

Impact GEO-3: Project construction could cause substantial soil erosion or the loss of topsoil. (Less than Significant)

Construction activities required for Project site development, such as excavation, backfilling, grading, and placement of fill material for surcharging purposes can expose areas of loose soil. The conceptual grading plan estimates 50,500 cubic yards of total earthwork. If not properly stabilized or protected, these soils could be subjected to soils loss and erosion by wind and storm water runoff. Concentrated water erosion, if not managed or controlled, can eventually result in significant soils loss. Excessive soil erosion can also eventually lead to damage of building foundations and roadways.

At the Project site, areas that are susceptible to erosion are those that would be exposed during the 22 month construction phase. However, construction contractors for Project site development are required by law to obtain a NPDES Permit from the RWQCB, and to obtain coverage under the Construction General Permit Order established by the California State Water Resources Control Board (SWRCB). The SWRCB established the General Construction Permit program to reduce surface water impacts from construction activities. The applicant would be required to file Permit Registration Documents, which include a Notice of Intent, SWPPP, and other compliance-related documents required by this General Permit.

As part of the SWPPP, the applicant would include specifications for BMPs that would need to be implemented during Project construction. Examples of BMPs that may be described in the SWPPP to limit soil erosion include, but are not limited to, scheduling or limiting activities to certain times of year and installing sediment barriers such as silt fence and fiber rolls (see also the discussion in Section 3.10, *Hydrology and Water Quality*).

Once construction is completed, the interior areas of the Project site would be developed, except for permeable landscaped areas. As a result, few locations would be created that would be exposed to the forces that cause erosion. With implementation of the requirements of the NPDES permit and associated SWPPP, the impact of erosion and loss of topsoil would be less than significant.

Mitigation: None required.

Impact GEO-4: Liquefaction and lateral spreading could damage the proposed new buildings, impairing and/or disrupting their intended operations. (Less than Significant)

As discussed in the setting, potentially liquefiable soils were identified at the site. The presence of liquefiable soils was determined in the geotechnical feasibility investigation through on-site cone

penetration testing and laboratory evaluation and stress testing of soil samples. Unconfined groundwater is present at 7 feet below ground surface. The quantitative measurements conducted for the geotechnical feasibility investigation are corroborated by the fact that the site is within a Santa Clara County liquefaction hazard zone.

The geotechnical feasibility investigation suggested potential measures to address the liquefaction hazard; however, these measures are only preliminary because a site-specific hazard investigation, which will gather more detailed site information, is required under the Seismic Hazards Mapping Act once the final structure configuration is determined. With the results of this investigation, it will be possible to choose which engineering practices to use to mitigate the liquefaction hazard. Possible practices include reduced allowable bearing pressures, over-excavation of potentially liquefiable layers, or the use of deep foundations.

As discussed above in Impact GEO-2, the applicant must engage an engineering geologist to conduct a site-specific hazard investigation. The recommendations of that investigation must become part of the Project. Foundations must be designed to tolerate anticipated total and differential settlements that could occur due to liquefaction of subterranean soil layers. A site-specific investigation report must be prepared and submitted to the City of Sunnyvale Building Division. With compliance with applicable construction requirements in the California Building Code and City code, and the design criteria from the geotechnical engineer or engineering geologist, this impact would be less than significant.

Mitigation: None required.

Impact GEO-5: The proposed new buildings could be subject to damage if placed on problematic soils. (Less than Significant)

Surficial soils at the Project site were identified as moderately to extremely expansive in the geotechnical feasibility investigation. Subsurface samples collected during the geotechnical feasibility investigation were also considered expansive based on the criteria in the California Building Code due to their plasticity index. As discussed in the setting, above, expansive soils can damage overlying structures as they are wetted and dried. The expansive soils present at the Project site could create substantial risks to the structures planned for the Project site.

As discussed above in Impact GEO-2, the California Building Code includes building permit requirements that mitigate the hazard posed by expansive soils. When a geotechnical investigation is required by a local agency, the California Building Code stipulates that a geotechnical report containing recommended provisions to mitigate the effects of expansive soils and special design and construction provisions for foundations of structures founded on expansive soils must be prepared and submitted to the issuer of the building permit. The geotechnical report also must include soil moisture content requirements for the site. The City of Sunnyvale General Plan states that geotechnical investigations are required for all development projects in Sunnyvale.

Development elements would be designed and constructed in accordance with requirements of the final design-level geotechnical report which include moisture content requirements along with minimum standards for expansion potential and would be submitted to the City for review and approval prior to the issuance of building permits. With compliance with applicable construction requirements in the California Building Code and City code, and the design criteria from the geotechnical engineer or engineering geologist, this impact would be reduced to a less-than-significant level.

Mitigation: None required.

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3.10 Hydrology and Water Quality

Introduction

This section addresses potential changes in hydrology, water quality, groundwater, and flooding conditions that could result from implementation of the Project. This section describes the existing hydrologic setting; provides an overview of the applicable federal, State, and local regulatory framework; and presents an analysis of potential environmental impacts. Information sources used to prepare this section include documents from various local, State, and federal agencies, the City of Sunnyvale General Plan, and published documents and maps related to the topic.

Environmental Setting

Regional Hydrology

The Project area is characterized by a Mediterranean climate with mild, wet winters and dry, warm summers. Both summer and winter temperatures are moderated by proximity to the San Francisco Bay and the Pacific Ocean; summer temperatures rarely reach those characteristic of inland valleys, and winter temperatures rarely reach freezing. Temperatures in the Santa Clara Valley typically range from 35 to 60 degrees Fahrenheit in the winter and 50 to 100 degrees Fahrenheit during the summer. Rainfall in the vicinity of the Project occurs mainly during the October through April rainy season, with an average annual rainfall of approximately 14 inches (Santa Clara County, 2007).

The Project site is located approximately three miles south from the shore of the Bay within the West Valley Watershed (SCVWD, 2013a). The West Valley Watershed covers an 85-square-mile area and consists of multiple small-creek watersheds. Creeks within the West Valley Watershed are generally characterized as channelized creeks on the valley floor and more natural streams in the hillsides (SCVWD, 2013b). Streams within the West Valley Watershed within the vicinity of the Project include Sunnyvale West Channel and Sunnyvale East Channel to the west of the Project site and Calabazas Creek and San Tomas Aquino Creek to the east of the Project site (SCVWD, 2013c). These creeks flow in a northerly direction and drain into the southern San Francisco Bay, either into or in the vicinity of the former Cargil Salt Ponds, which are undergoing wetland restoration.

Local Hydrology

The Project site is located within the Calabazas Creek Watershed (a sub-watershed within the West Valley Watershed). The Calabazas Creek Watershed covers 20 square miles and originates in the Santa Cruz Mountains terminating at Guadalupe Slough in south San Francisco Bay (SCVWD, 2013c). Major tributaries to Calabazas Creek include Prospect, Rodeo, and Regnart Creeks. Additional sources of water to Calabazas Creek include the El Camino storm drain (and the Junipero Serra Channel). The Calabazas Creek watershed is highly urbanized, predominantly

with high-density residential neighborhoods. Areas of heavy industry exist between the Highway 101 and Central Expressway corridors. Commercial development is focused along El Camino Real, Wolfe Road, and Saratoga-Sunnyvale Road (SCVURPPP, 2013).

Calabazas Creek traverses through a small portion of unincorporated County land, and flows through the cities of Saratoga, Cupertino, Sunnyvale, San Jose, and Santa Clara. The upper reaches of Calabazas Creek, where it passes through unincorporated County jurisdiction, and into Saratoga, are rural and the creek is relatively untouched. Beneficial uses outlined in the Basin Plan (Regional Water Quality Control Board [RWQCB], 2011) include Cold Freshwater Habitat (COLD), Warm Freshwater Habitat (WARM), Wildlife Habitat (WILD), Water Contact Recreation (REC-1), and Noncontact Water Recreation (REC-2). Water quality impairments are listed on the 303(d) list for Diazinon (pesticide).

The Project site is currently developed. The area surrounding the Project Site consists of urbanized land, sloping toward the north, towards San Francisco Bay. The topography of the Project site is generally flat with a slight slope from south to north. Elevations range from about 50 feet at the northern boundary, sloping up slightly to about 55 feet at the southern boundary. There are no natural surface drainages on the Project site. Streams in the vicinity of the Project site include an engineered channelized section of Calabazas Creek, located 1.4 miles to the east, and the Sunnyvale East Channel (engineered channel), located 0.1 miles to the west (SCVWD, 2013c).

Surface water at the Project site is mainly generated by precipitation that cannot be absorbed into the ground in the period following a storm. The amount of surface water runoff is a factor of precipitation, ground saturation, and available permeable or pervious ground surfaces. Permeability is a measure of how quickly water can penetrate a surface area. When there is limited amount of permeable area (such as developed land with compacted or paved ground), water runoff increases as compared to undeveloped land. The majority of the Project site is currently characterized as impervious surface. Storm runoff drains down gradient into the City of Sunnyvale stormwater conveyance system. The stormwater conveyance system collects and concentrates runoff through a network of impervious gutters, drainage structures, and underground pipes. The City of Sunnyvale owns and operates approximately 3,200 storm drain inlets, two pump stations and 150 miles of storm drains. Storm drain systems in Sunnyvale are designed to transport storm runoff to the San Francisco Bay or nearby creeks or channels (City of Sunnyvale, 2011a). Surface runoff from paved areas enters the storm drain system through storm drain inlets, which discharge directly to the Bay. The two pump stations collect runoff from low lying urban areas and discharge the runoff to creeks and sloughs. An underground 27-inch storm drain runs east-west along East Arques Avenue at the northern boundary of the Project site and conveys storm flow to Calabazas Creek (SCVWD, 2013c; BKF Engineers, 2013a). The Project site is currently served by an 18-inch main on Santa Ana Court which runs north and connects to the 27-inch main at East Arques Avenue (BKF Engineers, 2013a).

Water Quality

During periods of wet weather, rain carries pollutants and sediments from all parts of a watershed into surface water bodies such as storm drains, streams, rivers, reservoirs, or marshes. In an urban

setting, natural drainage patterns have been altered and stormwater runoff, as well as non-storm discharges (irrigation water, accidental spills, washdown water, etc.), pick up sediments and contaminants from land surfaces, and transport these pollutants into surface and ground water. These diffuse sources of pollutants include parking lots, bare earth at construction sites, agricultural sites, and a host of many other sources. Stormwater discharges from municipal storm sewer systems in urbanized areas such as in Sunnyvale are a concern because of the high concentration of pollutants typically found in these discharges.

Storm runoff is a nonpoint source of pollutants in the watershed, and is influenced by the surrounding land uses including developed lands and roadways. The Project site is currently developed and contains existing paved surfaces, existing buildings, and a parking lot. Common pollutants of concern from stormwater runoff can include pesticides, fertilizers, oils, litter and other debris, and sediment. Uncontrolled runoff from inadequately protected construction sites is a water quality concern due to the sediment and other pollutants such as petroleum products, construction chemicals, and asphalts.

Groundwater

Within the San Francisco Bay Hydrologic Region, the Project site is underlain by the Santa Clara Subbasin (Basin 2-9.02) within the larger Santa Clara Valley Basin (DWR, 2003). The Santa Clara Subbasin covers approximately 240 square miles (City of Sunnyvale, 2003) and is bound on the west by the Diablo Range and the Santa Cruz Mountains form the basin boundary on the east (DWR, 2003). It extends from the northern border of Santa Clara County to a groundwater divide near the town of Morgan Hill. Natural recharge occurs principally as infiltration from streambeds that exit the upland areas and drain to the north toward San Francisco Bay within the drainage basin and from direct percolation of precipitation that falls on the basin floor (DWR, 2004). Groundwater movement generally follows surface water patterns, flowing towards the interior of the subbasin and northerly towards San Francisco Bay. The Santa Clara Valley Water District (District) is the groundwater management agency for the Santa Clara Subbasins in Santa Clara County (SCVWD, 2012). Due to different land use and management characteristics, the District further delineates the Santa Clara Subbasin into two groundwater management areas: the Santa Clara Plain and the Coyote Valley. The thickness of the aquifer materials ranges from about 150 feet near the Coyote Valley to more than 1,500 feet in the interior of the subbasin (the Santa Clara Plain). The groundwater subbasin provides some natural filtration of surface water as it percolates through the soil and rock. Additionally, the groundwater subbasin provides water storage, allowing supply water to be carried over from the wet season to the dry season and even from wet years to dry years (SCVWD, 2012).

The water bearing formations of the Santa Clara subbasin include Pliocene to Holocene age continental deposits of unconsolidated to semi-consolidated gravel, sand, silt and clay. Within the formations making up the subbasin, Pleistocene to Holocene alluvium is the most important water bearing unit. The permeability of the valley alluvium is generally high and principally all large production wells derive their water from it. Comprised generally of unconsolidated gravel, sand, silt, and clay, it becomes progressively finer-grained at the central portions of the valley. A confined zone is created in the northern portion of the subbasin where overlain by a clay layer of

low permeability (SCVWD, 2012). The southern portion of the subbasin is generally unconfined and contains no thick clay layers (DWR, 2004). The District manages the subbasin as confined and recharge areas (SCVWD, 2012). Recharge areas, comprising the southern and eastern areas of the subbasin, are primarily comprised of high permeability aquifer materials like sands and gravels that allow surface water to infiltrate into the aquifers. Most groundwater recharge occurs in these areas through the infiltration of precipitation and managed recharge by the District to augment groundwater supplies. The confined areas, comprising the northern and western portions of the subbasin (underlying the Project site), impede the vertical flow of groundwater, causing principal aquifers to be under pressure and restricting the movement of contaminants, providing some natural water quality protection to principal aquifers (SCVWD, 2012). Historically, since the early 1900's through the mid-1960's, water level declines from groundwater pumpage induced subsidence in the Santa Clara subbasin and caused degradation of the aquifer adjacent to the bay from saltwater intrusion.

Depth to groundwater ranges from less than 10 feet to more than 1,000 feet below ground surface within the Subbasin (City of Sunnyvale, 2003). Groundwater levels have generally increased since 1965 as a result of an increase in recharge and decreases in groundwater pumping (DWR, 2004). Shallow ground water was measured at depths ranging from approximately 7 to 9 feet below the existing ground surface during geotechnical investigations conducted at the Project site (Cornerstone Earth Group, 2013). All measurements were taken at the time of drilling for geotechnical analysis and may not represent the stabilized groundwater levels, which may be seasonally higher than the initial levels encountered. The depth to groundwater at the nearby Philips Semiconductor cleanup site at 811 East Arques Avenue, located about 1,000 feet northeast of the Project site, was about 10 feet below the ground surface in 1999 (RWQCB, 1999), indicating the presence of shallow groundwater in the vicinity of the Project.

Water Quality

The Santa Clara Valley groundwater basin is used as an important source of municipal and domestic water, industrial process water, industrial service water, and agricultural supply (City of Sunnyvale, 2003; SCVWD, 2012). The groundwater in the major producing aquifers within the basin is generally of good to excellent quality and mineral composition and suitable for most uses. Overall, water is moderately hard to hard bicarbonate. Unlike surface water, most groundwater in the county can be used for drinking water without additional treatment and drinking water standards are met at public supply wells. Also, many of the sub-aquifers within the subbasin are slowly becoming contaminated as a result of factors such as industrial land uses, waste disposal sites, agricultural practices, and saltwater intrusion as a result of historic overdraught (City of Sunnyvale, 2003; City of Sunnyvale, 2011a). Areas with somewhat elevated mineral levels, perhaps associated with historical saltwater intrusion, have been observed in the northern basin in the vicinity of the Project site (DWR, 2004). Most drinking water is now pumped from depths of greater than 200 feet to avoid polluted groundwater in the upper aquifers. Additionally, shallow groundwater quality in urban environments can be affected by releases of hazardous materials to the subsurface soil and/or groundwater from industrial practices. As discussed in detail in Section 3.11, *Hazards and Hazardous Material,* there are a number of sites

within 0.25 miles of the Project site which may have the potential to affect groundwater quality at the Project if the associated contaminants migrate to the Project site.

Flooding

The three types of flood hazards in Sunnyvale are: 1) flooding from heavy rains overloading the drainage system, 2) potential inundation from the breakdown of local dams, and 3) tidal or tsunami related flooding. At the Project site and surrounding urban area, the storm drain system is designed to prevent flooding by channeling stormwater runoff northward via channels and culverts for eventual discharge to San Francisco Bay. Santa Clara Valley is classified as an active flood plain that has been severely altered by human activity. Approximately 1,800 acres of Sunnyvale has been designated by the Federal Emergency Management Agency (FEMA) as Special Flood Hazard Areas (SFHA). In Sunnyvale, SFHAs are generally located in the northeast portion of the City. Flood events are generally caused by a creek topping its banks, clogged catch basins or storm drains. The District maintains Calabazas Creek and the Sunnyvale East and West flood control channels. These channels, coupled with the City's storm drains take the majority of surface run-off to San Francisco Bay. The East and West Channels and Calabazas Creek were built to contain a 1% annual chance flood. According to the dam inundation area map for Sunnyvale (ABAG, 2013), there is the potential for portions of Sunnyvale to be inundated as a result of the breakdown of Stevens Creek Reservoir Dam, Lexington Dam, and Anderson Dam. These areas do not, however, include the Project site. A tsunami off the San Francisco coast could cause Bay water to top local levees, especially if it arrived at high tide. Tidal flooding could occur if the system of dikes and levees failed or their banks overflowed. Local earthquakes could cause failure in parts of the levee system which would create flood hazards if a tsunami were to occur also (City of Sunnyvale, 2011a).

The proposed Project would be located on a developed land parcel that does not lie in a mapped 100-year SFHA (City of Sunnyvale, 2011a) or in an area with flood risks associated with dam failure, tsunami, or tidal flooding (ABAG, 2013; CalEMA, 2009). The Project site is within an area subject to shallow flooding as a result of a 500-year flood event (FEMA, 2013).

Regulatory Framework

Federal

Clean Water Act

The federal Clean Water Act (CWA) (33 U.S.C. 1251 – 1376) establishes the basic structure for regulating discharges of pollutants into the waters of the U.S. and gives the U.S. EPA the authority to implement pollution control programs such as setting wastewater standards for industry. The CWA sets water quality standards for all contaminants in surface waters. The statute employs a variety of regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. The U.S. Army Corps of Engineers has jurisdiction over all waters of the U.S. including, but not limited to, perennial and intermittent streams, lakes, and ponds, as well as

wetlands in marshes, wet meadows, and side hill seeps. Under Section 401 of the CWA every applicant for a federal permit or license for any activity which may result in a discharge to a water body must obtain State Water Quality Certification that the proposed activity will comply with State water quality standards.

The National Pollutant Discharge Elimination System (NPDES) permit program under the CWA controls water pollution by regulating point and nonpoint sources that discharge pollutants into "waters of the U.S." California has an approved State NPDES program. The U.S. EPA has delegated authority for NPDES permitting to the California State Water Resources Control Board (SWRCB), which has nine regional boards. The San Francisco Bay RWQCB regulates water quality in the Project site and surroundings.

Section 303(d) of the CWA requires that each state identify water bodies or segments of water bodies that are "impaired" (i.e., not meeting one or more of the water quality standards established by the state). These waters are identified in the Section 303(d) list as waters that are polluted and need further attention to support their beneficial uses. Once the water body or segment is listed, the state is required to establish Total Maximum Daily Load (TMDL) for the pollutant causing the conditions of impairment. TMDL is the maximum amount of a pollutant that a water body can receive and still meet water quality standards. Generally, TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The intent of the Section 303(d) list is to identify water bodies that require future development of a TMDL to maintain water quality.

State

Porter-Cologne Water Quality Control Act and California's Water Boards

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides the basis for water quality regulation within California. This Act establishes the authority of the SWRCB and the nine RWQCBs. The SWRCB administers water rights, water pollution control, and water quality functions throughout the State, while the RWQCBs conduct planning, permitting, and enforcement activities. The Project site lies within the jurisdiction of the RWQCB, San Francisco Bay region.

The Porter-Cologne Water Quality Control Act requires the SWRCB to adopt statewide water quality control plans, the purpose for which is to establish water quality objectives for specific water bodies. In the San Francisco Bay region, the Water Quality Control Plan, known as the Basin Plan, is the RWQCB's master policy document. The Basin Plan contains descriptions of the legal, technical, and programmatic basis of water quality regulation in the region (RWQCB, 2011). The Act also authorizes the NPDES program, which establishes effluent limitations and quality requirements for discharges to waters of the State. In the San Francisco Bay region, the RWQCB has included permit requirements for stormwater runoff under the NPDES program since 1991.

Regional Water Quality Control Board Basin Plan

The San Francisco Bay RWQCB prepared the *San Francisco Bay Basin Water Quality Control Plan* (Basin Plan) for the San Francisco Bay region. The Basin Plan contains descriptions of the legal, technical, and programmatic bases of water quality regulation in the region and describes beneficial uses of major surface waters and their tributaries. For development under the Project, located within the Santa Clara Basin Hydrologic Planning Area, the RWQCB is responsible for regulating construction activities to ensure the protection of the beneficial uses of any receiving waters.

Construction Activity Permitting

The Project would be required to comply with the current NPDES permit requirements to control stormwater discharges from the construction site. Stormwater discharges from construction activities on one acre or more are regulated by the RWQCB and are subject to the permitting requirements of the NPDES General Permit for Discharges of Stormwater Runoff Associated with Construction Activity (General Construction Permit, 99-08-DWQ). Effective July 1, 2010, all dischargers have been required to obtain coverage under the Construction General Permit Order 2009-0009-DWQ[1] adopted on September 2, 2009. The SWRCB established the General Construction Permit program to reduce surface water impacts from construction activities. The Project applicant would be required to obtain coverage under the General Permit. The applicant would be required to file the Permit Registration Documents (PRDs), which includes a Notice of Intent (NOI), Storm Water Pollution Prevention Plan (SWPPP), and other compliance-related documents required by this General Permit and pay the appropriate permit fee to the SWRCB.

The construction general permit requires that the landowner and/or contractor file PRDs prior to commencing construction and pay an annual fee. These PRDs include a risk assessment, site map, SWPPP, and signed certification statement. The permit specifies a risk-based approach that includes requirements specific to three overall levels of risk, determined based on the potential for the Project to cause sedimentation as well as the sensitivity of the receiving water to sedimentation. The three risk levels are used to determine specific numeric action levels, as well as requirements for a rain event action plan, implementation of best management practices (BMPs), monitoring, and reporting.

The General Construction Permit requires the preparation and implementation of a SWPPP for construction activities and specifies minimum qualifications for a qualified SWPPP developer and a qualified SWPPP practitioner.The SWPPP must be prepared before the construction begins, and in certain cases, before demolition begins. The SWPPP must include specifications for BMPs that would need to be implemented during Project construction. BMPs are measures that are undertaken to control degradation of surface water by preventing soil erosion or the discharge of pollutants from the construction area. The SWPPP must describe measures to prevent or control runoff after construction is complete and identify procedures for inspecting and maintaining facilities or other project elements. Required elements of a SWPPP include:

[1] As amended by 2010-0014-DWQ and 2012-006-DWQ.

1. Site description addressing the elements and characteristics specific to the site;
2. Descriptions of BMPs for erosion and sediment controls;
3. BMPs for construction waste handling and disposal;
4. Implementation of approved local plans;
5. Proposed post-construction controls; and
6. Non-stormwater management.

Examples of typical construction BMPs include scheduling or limiting activities to certain times of year, installing sediment barriers such as silt fence and fiber rolls, maintaining equipment and vehicles used for construction, tracking controls such as stabilizing entrances to the construction site, and developing and implementing a spill prevention and cleanup plan. Non-stormwater management measures include installing specific discharge controls during certain activities, such as paving operations, and vehicle and equipment washing and fueling. The California Stormwater Quality Association established BMPs for the State of California in the *California Storm Water Best Management Practice Handbook* (2003) to effectively reduce degradation of surface waters to an acceptable level.

Dewatering Permit

Construction activities such as excavation and trenching in areas with shallow groundwater would require dewatering, which would be subject to the SWRCB construction dewatering permit requirements. Dewatering operations are regulated under State requirements for stormwater pollution prevention and control. Discharge of non-stormwater from a trench or excavation that contains sediments or other pollutants to sanitary sewer, storm drain systems, creek bed (even if dry), or receiving waters is prohibited. Discharge of uncontaminated groundwater from dewatering is a conditionally exempted discharge by the RWQCB. However, the removed water could potentially be contaminated with chemicals released from construction equipment or sediments from excavation. Therefore, disposal of dewatering discharge would require permits either from the RWQCB for discharge to surface creeks and groundwater or from local agencies for discharge to storm or sanitary sewers. The SWRCB lists non-stormwater discharge controls specifically for dewatering operations. The control measures would be implemented by the Project applicant during construction activities at the Project site. Discharge of water resulting from dewatering operations would require an NPDES Permit, or a waiver (exemption) from the RWQCB, which would establish discharge limitations for specific chemicals (if they occur in the dewatering flows).

Local

City of Sunnyvale General Plan

The City of Sunnyvale General Plan (City of Sunnyvale, 2011a) contains the following relevant goals, policies, and actions in Chapter 6, Safety and Noise, and Chapter 7, Environmental Management, related to hydrology, water quality, and flooding in the Project Site and surroundings:

- **Goal EM-10:** Reduce runoff and pollutant discharge.
  - ***Policy EM-8.3*:** Ensure that stormwater control measures and Best Management Practices (BMPs) are implemented to reduce the discharge of pollutants in storm water to the maximum extent practicable.

- **Goal SN-1:** Acceptable levels of risk for natural and human-caused hazards.
  - ***Policy SN-1.3*:** Operate and maintain the storm drainage system at a level to minimize damages and ensure public safety.

Municipal Code

The City of Sunnyvale Municipal Code includes requirements to manage water flows and improve the quality of stormwater runoff (Chapter 12.60). These measures are intended to decrease flooding, protect the environment and conserve water. The applicant would be required to prepare a Stormwater Management Plan (SWMP) for submission with the building permit application to the City. Chapter 12.60 sets forth BMPs for erosion control and stormwater management, such as soil/stock pile stabilization, for major projects to achieve measurable reduction in stormwater runoff and manage stormwater quality. These mandatory measures are detailed in SWMPs, which are technical documents that determine the appropriate BMPs to be used for a particular project (City of Sunnyvale, 2011b). Chapter 12.60 includes requirements for Low Impact Design, the goal of which is "to reduce runoff and mimic a site's predevelopment hydrology by implementing specific practices to control sources of potential pollution and site design strategies to treat stormwater" (Sunnyvale Municipal Code Section 12.60.155). Section 12.60.155 requires, among other things, that all projects that create or replace 10,000 square feet or more of impervious surfaces provide stormwater treatment through stormwater harvesting and re-use, infiltration, evapotranspiration, or biotreatment; biotreatment is permitted only if the other three approaches are shown to be infeasible. The amount of a site's stormwater runoff that must be treated is based on volume or flow rate criteria set forth in Section 12.60.150.

Santa Clara Valley Urban Runoff Pollution Prevention Program

The Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP), previously called the Santa Clara Valley Non-point Source Program, was developed in response to the Federal Clean Water Act, in accordance with the requirements of the 1986 Basin Plan. The purpose of the program is to reduce water pollution associated with urban stormwater runoff.

In 1990, the RWQCB issued (and reissued in 2009) an area-wide Municipal Permit to the SCVURPPP member agencies. This common permit allows each of the SCVURPPP's 15 co-permittees, including the City of Sunnyvale, to discharge stormwater from their storm drain systems to San Francisco Bay. Under the provisions of the Municipal Permit, the City is required to take steps within its area of authority to reduce or eliminate pollutants in stormwater to the maximum extent practical.

An amendment to Provision C.3 of the SCVURPPP NPDES permit requires new and redevelopment projects that result in the addition or replacement of impervious surfaces totaling 10,000 square feet or more to include specific construction and post-construction stormwater

treatment measures. According to Provision C.3, applicable projects must implement BMPs for reducing the volume of runoff and treating all runoff on-site prior to outfall into the drainage system. Under the SCVURPPP, property owners and contractors share ultimate responsibility for the activities that occur on a construction site. Owners and contractors may be held responsible for any water quality degradation caused by subcontractors or employees (City of Sunnyvale, 2003).

Impacts and Mitigation Measures

Significance Criteria

Based on Appendix G of the CEQA *Guidelines*, the proposed Project would result in significant hydrology or water quality impacts if the project would:

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

Approach to Analysis

The impact analysis for the proposed Project is based on a review of the existing conditions at the site and assessment of the changes that would occur due to the Project. The changes in the

hydrological conditions at the Project site are assessed to determine if the Project would have a significant adverse effect. The level of significance is based on the CEQA significance criteria listed above and the regulatory requirements and standards that are discussed in the regulatory framework.

In many cases, compliance with laws, regulations, and mandatory regulatory permits prescribe actions that reduce the adverse effects of Project implementation. Should Project impacts remain potentially significant under CEQA even after such actions are implemented, mitigation measures to reduce Project impacts to less-than-significant levels are proposed.

Due to the location and characteristics of the Project site, certain hydrologic conditions are not associated with the Project and therefore, are not considered potential impacts. These hydrologic conditions are addressed briefly below and are not discussed further in this document.

100-Year Flood Zone: The Project site is not located within a 100-year flood zone as indicated in maps compiled by FEMA. The site is already developed and would not increase flood flows or place within a 100-year flood hazard area structures that would impede or redirect flood flows. Therefore, based on Project plans and site location, there would be no impact related to placement in a 100-year flood hazard area.

Seiche, Tsunami, or Mudflow: The Project site is located approximately three miles south of the South San Francisco Bay shoreline, and is not susceptible to coastal hazards (tsunami, extreme high tides, or sea level rise). Tsunami waves would have to travel from the Pacific Ocean through the Golden Gate to finally reach the shoreline nearest the Project site. Due to natural attenuation, the probability of significant tsunami waves impacting the Project site are very low. Seiches are large waves on an enclosed or semi-enclosed body of water that can be caused by seismic activity. San Francisco Bay is partially enclosed, with outlets to San Pablo Bay, as well as the Pacific Ocean via the Golden Gate. Geologic-induced seiche events have not been documented in San Francisco Bay. There are no other large open bodies of water near the Project site; therefore the site is not susceptible to damage from a seiche. The proposed Project site is relatively flat and not subject to mudflows. Therefore, there is no impact associated with these hazards.

Impact Analysis

Impact HYD-1: The Project could violate water quality standards or violate waste discharge requirements. (Less than Significant)

Stormwater runoff generated from the Project site is currently collected on-site and delivered to existing storm sewer facilities which direct flows to the north of the site, ultimately emptying into San Francisco Bay. Stormwater runoff from soil disturbance associated with construction activities is a common source of pollutants to receiving waters. Activities that disturb the ground could make soils and sediments more susceptible to erosion by altering their existing structure or state. Depending on the distance and ground slope, some portion of the eroded material could eventually be delivered to a receiving stream channel or other type of waterway over a relatively short time period (e.g., during the next rain event). In this case, increased erosion rates would likely

lead to increased sediment concentrations and turbidity levels in the receiving stream channel and have a potentially adverse impact on the beneficial uses identified in the Basin Plan.

Hazardous materials associated with construction activities would likely involve paint, solvents, oil and grease, and petroleum hydrocarbons. If improperly handled during demolition activities, these materials could degrade water quality. Storage and use of hazardous materials at the Project site during construction activities would comply with BMPs as specified in the required SWPPP, described above. Adherence to BMPs would effectively reduce potential impacts to groundwater quality associated with spills or leaks of hazardous materials and stormwater quality during construction to a less-than-significant level.

It is possible that subsurface excavation during Project construction could intercept shallow groundwater tables. Dewatering activities would involve pumping of the water from the excavated area (non-stormwater discharge) and would be subject to the SWRCB construction dewatering permit requirements. The SWRCB lists non-stormwater discharge controls specifically for dewatering operations. Discharge of non-stormwater from a trench or excavation that contains sediments or other pollutants to sanitary sewer, storm drain systems, creek bed (even if dry), or receiving waters is prohibited. Discharge of uncontaminated groundwater from dewatering is a conditionally exempted discharge by the RWQCB. However, the removed water could potentially be contaminated with chemicals released from construction equipment, sediments from excavation, or from contaminated groundwater from offsite sources. Therefore, it is likely that disposal of dewatering discharge would require permits either from the RWQCB or from local agencies for discharge to storm or sanitary sewers. The control measures would be implemented by the applicant during construction activities at the Project site. Discharge of water resulting from dewatering operations would require an NPDES Permit, or a waiver (exemption) from the RWQCB, which would establish discharge limitations for specific chemicals (if they occur in the dewatering flows) to reduce potential impacts to water quality.

Because the Project site exceeds one acre in size, the Project applicant will be required to apply for coverage under the State General Construction Permit to comply with federal NPDES regulations. In accordance with General Plan/Municipal Code requirements and the State General Construction Permit, the applicant would file a Notice of Intent with the State Water Resources Control Board, then develop and implement a SWPPP that identifies appropriate construction BMPs in order to minimize potential sedimentation or contamination of stormwater runoff generated from the Project site. The SWPPP is a standard requirement, is based upon the approved final Project, would be prepared prior to Project implementation, and would specify BMPs that would be implemented during construction. Preparation and approval of the SWPPP would therefore reduce potential degradation of water quality associated with Project construction to a less-than-significant level through compliance with NPDES permit regulations.

The Project would also be subject to compliance with the City of Sunnyvale stormwater requirements for projects that replace over 10,000 square feet of impervious surfaces. As such, the applicant would be required to prepare a SWMP that details post construction BMPs that would be incorporated into Project plans to reduce potential stormwater impacts. The City is a co-

permittee agency listed in the Municipal NPDES Stormwater Permit. Municipal agencies in Santa Clara County, including Sunnyvale, the County of Santa Clara, and the Santa Clara Valley Water District, joined to form the SCVURPPP to coordinate compliance with all of the elements required in the permit, including the regulations that require stormwater treatment controls at certain new development and redevelopment projects. The City and SCVURPPP have developed complementary guidelines for the post-construction treatment requirements.

As described above under Regulatory Setting, Section 12.60.155 of the Sunnyvale Municipal Code requires that that all projects that create or replace 10,000 square feet or more of impervious surfaces provide stormwater treatment through Low Impact Development (LID) treatment measures including stormwater harvesting and re-use, infiltration, evapotranspiration, or biotreatment; biotreatment is permitted only if the other three approaches are shown to be infeasible. Accordingly, the applicant would be required to design and install adequate LID stormwater treatment controls for the Project, based on the criteria in Municipal Code Section 12.60.150, as well as ensure that long-term maintenance of the controls is provided.

Following the completion of construction activities, application of pesticides and herbicides related to landscape maintenance would be potential sources of polluted stormwater runoff. Otherwise, there would not be a significant change in use of the site in terms of sources of stormwater runoff quality, and the Project would not adversely affect surface or groundwater quality. Regardless, as previously discussed, the Project would be required to comply with City of Sunnyvale and SCVURPPP stormwater quality protection requirements where applicable. Therefore, potential water quality impacts associated with the Project would be considered less than significant.

Mitigation: None required.

Impact HYD-2: The Project could deplete groundwater supplies or interfere substantially with groundwater recharge. (Less than Significant)

The Project would not involve long-term groundwater extraction. The water supply for the existing developments on the Project site is the municipal water supply system, managed by the City of Sunnyvale, which utilizes three different sources: purchased surface water from the San Francisco Public Utilities Commission (SFPUC), purchased treated water from the Santa Clara Valley Water District (SCVWD), and groundwater from seven wells owned and operated by the City of Sunnyvale. These groundwater wells are used by the City as a supplemental source to the imported SFPUC and SCVWD water supplies. As further discussed in Section 3.13, *Utilities and Service Systems,* the existing potable water demand at the Project site is 38 acre feet per year (or about 34,000 gallons per day [gpd]) (City of Sunnyvale, 2013). The Project would have an estimated potable water demand of 29 acre feet per year (25,800 gpd) (BKF Engineers, 2013b). At full build out the Project would thus result in a potable water demand decrease of 9 acre feet annually as compared to existing conditions; the primary reason for the decrease is the planned use of non-potable recycled water to meet about half of the Project’s projected water supply demand. The City has completed a Water Supply Analysis for the Project that concludes that

there is adequate potable water supply to meet the Project's demand (City of Sunnyvale, 2013). The City of Sunnyvale has contracts in place and adequate supplies from SFPUC, SCVWD, groundwater, and recycled water to meet the proposed Project's water demand. Therefore, the Project would not result in the depletion of local groundwater supplies.

Project construction would involve subsurface excavation (for utilities and structural support). As described in the Environmental Setting, groundwater depths vary from seven to nine feet below ground surface at the Project site. It is possible that subsurface excavation during Project construction could intercept shallow groundwater tables. Groundwater encountered during excavation activities would have to be pumped out of the construction trench in order to create a dry work area. However, this activity would be temporary and is unlikely to involve extensive dewatering; this activity therefore would not substantially affect groundwater levels in the Santa Clara Subbasin. The majority of the Project site is currently covered with impervious surfaces. Under the proposed Project, there would be an overall decrease in the amount of impervious surfaces. The Project would not lower the groundwater table as a result of groundwater extraction or through a reduction in groundwater recharge. Therefore, potential impacts relating to groundwater supply and recharge would be less than significant.

Mitigation: None required.

Impact HYD-3: The Project could alter existing drainage patterns, causing downstream erosion, siltation, or flooding. (Less than Significant)

In general, changes in urban development can be accompanied by decreases in natural ground cover and an increase in impervious surfaces (such as paved areas and buildings). Such alterations can change the volume and rate of runoff, resulting in impacts downstream related to erosion, siltation, and flooding.

The Project site is already developed and the majority of the site is covered by impervious surfaces, such as access roads, buildings, and parking lots. Redevelopment of the site under the proposed Project would not involve the alteration of a stream or river and would not alter on-site drainage patterns.

Additionally, the Project would include design features that incorporate stormwater management guidelines, as required by local regulations. The Project would increase the amount of pervious surfaces (e.g., sidewalk planters, planter strips, permeable pavers, porous asphalt parking lots, stormwater detention and infiltration swales) and would therefore result in a net reduction in stormwater flows offsite. Because the Project would not cause an increase in stormflows, the potential impact of altered drainage causing offsite sedimentation, erosion, or offsite or on-site flooding would be less than significant.

In addition, site-specific Project plans would be required to adhere to Municipal Code provisions, which would require source controls of stormwater volumes and BMPs for stormwater quality

management, including implementation of Low Impact Design stormwater treatment measures. Adherence to these existing stormwater requirements would generally improve drainage facilities over existing conditions, require erosion and sedimentation control measures for construction and operation, comply with the local SWMP requirements for development within the City of Sunnyvale, and require design standards that would reduce the amount of stormwater going offsite to the extent practical.

As noted above (Impact HYD-1), during construction, the Project would be subject to the NPDES General Construction Permit requirements which include preparation of a SWPPP. The SWPPP must include site specific erosion and sedimentation control practices. Incorporation of these guidelines, ordinances, and permit requirements would ensure that new development or redevelopment projects facilitated by the Project would limit the amount of runoff that would be directed offsite and could even reduce volumes over existing conditions. Adherence to these requirements would also be effective in minimizing the potential for erosion or siltation to affect receiving waters. Therefore, the Project would not alter drainage patterns and would not cause downstream erosion, siltation, or flooding, and the impact would be less than significant.

Mitigation: None required.

Impact HYD-4: The Project could result in increased stormwater runoff from the Project site. (Less than Significant)

As discussed under Impacts HYD-1 and HYD-3, above, construction and operation of the proposed Project would not result in any substantial changes to on-site water quality associated with stormwater runoff and would not result in polluted runoff offsite. Implementation of BMPs under the SWPPP and compliance with SCVURPPP requirements would reduce potential impacts to water quality to a less-than-significant level.

The Project site is currently served by an 18-inch main on Santa Ana Court which runs north and connects to the 27-inch main at East Arques Avenue. Under the proposed Project, the main on Santa Ana Court would be removed and the site would be served by 24-inch storm drain connections at North Wolfe Road and East Arques Avenue (BKF Engineers, 2013a). Additionally, as discussed under Impact HYD-3, above, redevelopment of the Project site would increase pervious surfaces at the site and decrease stormwater runoff. An analysis of stormwater runoff prepared for the applicant (BKF Engineers, 2013a) concluded that the Project's planned decrease in impervious area at the Project site will result in a decrease in stormwater runoff from 26.33 cubic feet per second (cfs) to 21.84 cfs, a reduction of 17.1% from the existing condition. The analysis considered a design intensity ten year storm with a ten minute duration of approximately 1.8 inches per hour, consistent with the requirements of the County of Santa Clara Drainage Manual (County of Santa Clara, 2007). In addition, implementation of stormwater quality features, such as biotreatment planters, in compliance with SWMP requirements and associated BMPs under Municipal Code Section 12.60 would further reduce runoff from the site. Therefore,

the Project would not exceed the capacity of stormwater drainage systems, and would not result in substantial additional sources of polluted runoff. This impact is therefore less than significant.

Mitigation: None required.

Impact HYD-5: The Project could expose people or structures to a significant risk of loss, injury or death involving flooding. (Less than Significant)

The Project site is not located near levees or dams and would not be exposed to flooding from failure of one of these structures. According to maps compiled by the Association of Bay Area Governments (ABAG), the Project site is not located in an inundation area for the Stevens Creek Reservoir Dam, Lexington Dam, or Anderson Dam under a catastrophic failure event (ABAG, 2013). According to maps compiled by the San Francisco Bay Conservation and Development Commission (BCDC), a projected sea-level rise of 55 inches by the year 2100 would affect large areas around the Bay perimeter. The maps indicate that the Project site would be located outside of anticipated inundation areas (BCDC, 2011). The Project site is also located outside the 100-year flood zone designated by the FEMA. Therefore, flooding hazards related to the proposed Project would be less than significant.

Mitigation: None required.

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3.11 Hazards and Hazardous Materials

Introduction

This section presents and evaluates the potential for hazards and hazardous materials impacts related to the Project. This section describes the environmental setting and regulatory framework that is applicable to health and safety regarding hazards and hazardous materials associated with the Project.

Environmental Setting

The area surrounding the Project site is currently developed with broad, tree-lined, multi-laned thoroughfares and mostly single-story commercial, research and development, and public service buildings. Industrial and urban land uses involving hazardous materials and other substances can become a health hazard to humans or the environment if not properly contained or managed. Industrial land use typically involves storage of large quantities of fuel or hazardous materials in above-ground or underground storage tanks (USTs). A wide array of potential hazardous materials sources originate from urban land uses, such as gasoline service stations, dry cleaners, and other facilities that utilize or store solvents, chemicals or other hazardous materials. These sources of hazardous materials, if encountered by construction workers or the general public, can cause exposures that may result in adverse environmental and health effects.

Definition of Hazardous Materials

A hazardous material is defined as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment (State of California, Health and Safety Code, Chapter 6.95, Section 25501(o)). The term “hazardous materials” refers to both hazardous substances and hazardous waste. Under federal and state laws, any material, including wastes, may be considered hazardous if it is specifically listed by statute as such or if it is toxic (causes adverse human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases).

In some cases, past industrial or commercial activities on a site have resulted in spills or leaks of hazardous materials into the ground, resulting in soil and/or groundwater contamination. Hazardous materials may also be present in building materials and released during building demolition activities. If improperly handled, hazardous materials and wastes can cause public health hazards when released to the soil, groundwater, or air. The four basic exposure pathways through which an individual can be exposed to a hazardous material include: inhalation, ingestion, bodily contact, and injection. Exposure can come as a result of an accidental release of hazardous materials during transportation, storage, or handling. Disturbance of contaminated subsurface soil during construction can also cause exposures to workers, the public or the environment through stockpiling, handling, or transportation of soils.

Soil and Groundwater Contamination

In California, regulatory databases listing hazardous materials sites provided by numerous federal, State, and local agencies are consolidated in the "Cortese List" pursuant to Government Code Section 65962.5. The Cortese List is located on the California Environmental Protection Agency's (Cal EPA) website and is a compilation of the following lists:

- List of Hazardous Waste and Substances sites from Department of Toxic Substances Control (DTSC) EnviroStor database;
- List of Leaking Underground Storage Tank (LUST) Sites by County and Fiscal Year from the State Water Resources Control Board (SWRCB) GeoTracker database;
- List of solid waste disposal sites identified by SWRCB with waste constituents above hazardous waste levels outside the waste management unit;
- List of "active" Cease and Desist Order and Cleanup and Abatement Order from the SWRCB; and
- List of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code, identified by DTSC and listed on their EnviroStor database (DTSC, 2013).

The SWRCB GeoTracker database includes LUSTs, permitted USTs, and Spills, Leaks, Investigations, and Cleanup Database (SLIC) sites. The DTSC EnviroStor database includes federal and State response sites, voluntary, school, and military cleanups and corrective actions, and permitted sites. The five databases cited above identify sites with suspected and confirmed releases of hazardous materials to the subsurface soil and/or groundwater. The reporting and status of each site changes as identification, monitoring, and clean-up of hazardous materials progress. Typically, a site is closed once it has been demonstrated that existing site uses combined with the levels of identified contamination present no significant risk to human health or the environment.

At the Project site there are no active LUST or Cleanup Program sites. Within 0.25 miles of the Project site, there are nine listed Cleanup Program sites, listed in **Table 3.11-1** below (SWRCB, 2013; DTSC, 2013). The cleanup sites beyond the Project site boundary may have the potential to affect the Project if the contaminants associated with those sites migrate to the Project site. However, these sites are not known to be currently affecting the Project site. There are also five known permitted UST sites within 0.25 miles of the Project site. However, the permitted UST sites are not known to have contamination issues.

Fuel Contamination from Leaking Underground and Aboveground Storage Tanks

A UST system is a storage tank and any underground piping connected to the tank that has at least 10% of its combined volume underground. Until the mid-1980s, most USTs were made of single-walled bare steel, which were found to corrode over time resulting in leakage. Faulty installation or maintenance procedures also lead to UST leakage, in addition to potential releases

TABLE 3.11-1
REGULATORY SITES LISTED IN THE PROJECT SITE VICINITY

Site Name/ Address	Regulatory List	Site Summary
T-M Manufacturing 695 East Arques Avenue	Cleanup Program Site	Potential for groundwater and soil contamination. Potential contaminates of concern include trichloroethane and trichloroethylene.
T-M Manufacturing 695 East Arques Avenue	Permitted UST	
Chevron #97606 296 North Fairoaks Avenue	Permitted UST	
TRW Microwave 825 Stewart Drive	Cleanup Program Site	Potential for groundwater contamination. Potential contaminates of concern include trichloroethylene and trichloroethene
AMD – Buildings 901/902 901-902 Thompson Place	Cleanup Program Site	Potential for groundwater contamination. Potential contaminates of concern include trichloroethylene and volatile organic compounds.
Philips Semiconductors (Signetics) 811 East Arques Avenue	Cleanup Program Site	Potential for groundwater contamination. Potential contaminates of concern include trichloroethane, freon, other chlorinated hydrocarbons, trichloroethylene, vinyl chloride, volatile organic compounds and xylene.
City of Sunnyvale 221 Commercial Street	Permitted UST	
The John Lincoln Company 172 Commercial Street	Permitted UST	
Magnetics, Inc. 158 San Lazaro Avenue	Cleanup Program Site	Potential for groundwater contamination. Potential contaminates of concern include volatile organic compounds.
Fabtech Mechanical 154 San Lazaro Avenue	Cleanup Program Site	Potential for drinking water, soil, and soil vapor contaminates. Potential contaminates of concern include trichloroethane and trichloroethylene.
Radiation Detection Company 162 North Wolfe Road	Cleanup Program Site	Potential for contamination not specified.
Royal Auto Body 150 North Wolfe Road	Cleanup Program Site	Potential for groundwater contamination. Potential contaminates of concern include trichloroethylene and gasoline.
Philips Semiconductors – Kifer 740 Kifer Road	Cleanup Program Site	Potential for groundwater contamination. Potential contaminates of concern include trichloroethane, trichloroethylene, other chlorinated hydrocarbons, and other solvents.
Philips Semiconductors – Kifer 740 Kifer Road	Permitted UST	

SOURCE: SWRCB, 2013; DTSC, 2013.

associated with spills. Recently revised UST regulations have significantly reduced the incidents of UST leakage from new UST systems and the consequential soil and groundwater contamination. However, there are some older UST systems that remain in service and many sites contaminated by leaking USTs that are still under investigation and clean-up. USTs installed prior to the mid-1980's that have leaked, as well as improperly installed USTs that have resulted in fuel spills can present contamination issues within the vicinity of the Project site. In addition, it is not uncommon for older USTs to have been abandoned in place with no documentation of location or abandonment technique. There are no known UST sites located within 0.25 miles of the Project site that have contamination issues.

Contamination from Spills and Leaks

Spills and leaks of chemicals can contaminate soil and groundwater when proper precautions are not in place. Various businesses and industries transport, use, and dispose of chemicals and may improperly or accidentally release them into the environment. Chemicals can include but are not limited to heavy metals, solvents, and flammable materials. Non-permitted discharges of these chemicals are documented by the San Francisco Bay Regional Water Quality Control Board (RWQCB) in the Spills SLIC list. There are no known SLIC sites within 0.25 miles of the Project site.

Other Classifications for Contaminated Sites

Other sites with contaminated soil and/or groundwater could include those in the Formerly Used Defense Sites (FUDS) database; Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) database; sites under DTSC oversight; as well as sites listed for voluntary cleanup. There are no such known sites within 0.25 miles of the Project site.

Hazardous Building Materials Associated with Demolition

The Project includes the demolition of nine existing, 1-story industrial buildings, which were constructed in the mid-1970s. These buildings may have been constructed with hazardous building materials. These materials include lead-based paint, asbestos-containing materials, and polychlorinated biphenyls (PCBs), and if disturbed could present a potential hazard to workers or the public.

Lead-Based Paint

Prior to the U.S. Environmental Protection Agency (U.S. EPA) ban in 1978, lead-based paint was commonly used on interior and exterior surfaces of buildings. Through such disturbances as sanding and scraping, renovation work, or gradual wear and tear, old peeling paint or paint dust particulates have been found to contaminate surface soils or cause lead dust to migrate and affect indoor air quality. Exposure to residual lead can cause severe adverse health effects especially in children.

Asbestos-Containing Materials

Asbestos is a naturally-occurring fibrous material that was extensively used as a fireproofing and insulating agent in building construction materials before such uses were banned by the U.S. EPA in the 1970s. Asbestos was commonly used for insulation of heating ducts as well as ceiling, floor, and roofing tiles. Similar to lead-based paint, undisturbed asbestos contained within the building materials presents no significant health risk, but once the material is disturbed, the fibers can become airborne and create potential exposure pathways. The fibers are very small and cannot be seen with the naked eye. Once they are inhaled, they can become lodged in the lung, potentially causing lung disease or other pulmonary complications.

Polychlorinated Biphenyls

PCBs are organic oils that were formerly used primarily as insulators in many types of electrical equipment, including transformers and capacitors. After PCBs were determined to be a carcinogen in the mid to late 1970s, the U.S. EPA banned PCB use in most new equipment and began a program to phase out certain existing PCB-containing equipment. Fluorescent lighting ballasts manufactured after January 1, 1978, do not contain PCBs and are required to have a label clearly stating that PCBs are not present in the unit.

Radon

Radon is a naturally-occurring odorless, tasteless, and invisible gas produced from the decay of uranium in soil and water (U.S. EPA, 2013a). Structures placed on native soils with elevated levels of radon can be impacted by the intrusion of radon gas into breathing spaces of the overlying structures, which can cause lung cancer. Santa Clara County is listed as a Zone 2 county with a predicted average indoor radon screening level between 2 and 4 picocuries per liter. This is considered a moderate level by the U.S. EPA. The U.S. EPA recommends remedial action for areas with levels above 4 picocuries per liter (U.S. EPA, 2013b). Based on the U.S. EPA information, the Project site is not considered to be to have radon above the recommended health risk level.

Schools and Daycare Facilities

There are no schools located on the Project site. Additionally, there are no registered Pre-School facilities or grade schools located within 0.25 miles of the Project site. There are two universities located within 0.25 miles of the Project site. California South Bay University is located at 830 Steward Drive, approximately 0.20 miles north of the Project site. The Nine Star University is located at 441 De Guigne Drive, approximately 0.24 miles northeast of the Project site.

Airports

Aviation safety hazards can result if projects are located in the vicinity of airports. The nearest public airport to the Project site is Mineta San Jose International Airport, located approximately 3.5 miles southeast of the Project site. The nearest airstrip is Moffett Federal Airfield, located just over two miles northwest of the Project site. The Project site is not situated within the approach or air traffic pattern protection zones of the Mineta San Jose International Airport or Moffett Federal Airfield and therefore is not subject to any development limitations (Santa Clara County Airport Land Use Commission, 2011; Santa Clara County Airport Land Use Commission, 2012).

Wildland Fires

The California Department of Forestry and Fire Protection (CAL FIRE) is required by law to map areas of significant fire hazard based on fuels, terrain, weather, and other relevant factors (PRC 4201-4204 and Govt. Code 51175-89). Factors that increase an area’s susceptibility to fire hazards include slope, vegetation type and condition, and atmospheric conditions. The CAL FIRE Santa Clara County Fire Hazard Severity Zone Map does not identify any very high or high fire hazard zones at the Project site (CAL FIRE, 2007).

Regulatory Framework

Federal, State and local laws and regulations govern the range of hazardous materials issues that may be encountered during construction, development, and operation of the Project. Various State and local regulatory agencies implement these laws and regulations to minimize risks to human health and the environment from hazardous materials. This section describes the regulatory oversight of hazardous materials storage and handling, emergency response, site investigation and cleanup, and worker safety. In addition, regulations regarding fire hazards and local plans and policies are discussed.

Federal Regulations

Hazardous Materials Management

The primary federal agencies with responsibility for hazardous materials management include the U.S. EPA, U.S. Department of Labor Occupational Safety and Health Administration (OSHA), and the U.S. Department of Transportation. State and local agencies often have either parallel or more stringent regulations than federal agencies. In most cases, state law mirrors or overlaps federal law and enforcement of these laws is the responsibility of the state or of a local agency to which enforcement powers are delegated. For these reasons, the requirements of the law and its enforcement are discussed under either the state or local agency section.

Hazardous Materials Transportation

The U.S. Department of Transportation regulates hazardous materials transportation on all interstate roads. Within California, the State agencies with primary responsibility for enforcing federal and State regulations and for responding to transportation emergencies are the California Highway Patrol and California Department of Transportation. Together, federal and State agencies determine driver-training requirements, load labeling procedures, and container specifications. Although special requirements apply to transporting hazardous materials, requirements for transporting hazardous waste are more stringent, and hazardous waste haulers must be licensed to transport hazardous waste on public roads.

Occupational Safety

The federal Occupational Safety and Health Administration (Fed/OSHA) is the agency responsible for assuring worker safety in the handling and use of chemicals in the workplace. The federal regulations pertaining to worker safety are contained in Title 29 of the Code of Federal Regulations (CFR), as authorized in the Occupational Safety and Health Act of 1970. They provide standards for safe workplaces and work practices, including standards relating to hazardous materials handling. At sites known or suspected to have soil or groundwater contamination, construction workers must receive training in hazardous materials operations and a site health and safety plan must be prepared. The health and safety plan establishes policies and procedures to protect workers and the public from exposure to potential hazards at the contaminated site.

State Regulations

In January 1996, the California Environmental Protection Agency adopted regulations implementing a Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program). The program has six elements: hazardous waste generators and hazardous waste on-site treatment; underground storage tanks; aboveground storage tanks; hazardous materials release response plans and inventories; risk management and prevention programs; and Unified Fire Code hazardous materials management plans and inventories. The plan is implemented at the local level. The Certified Unified Program Agency is the local agency that is responsible for the implementation of the Unified Program. In the City of Sunnyvale, the Sunnyvale Department of Public Safety is the designated Certified Unified Program Agency for all businesses.

Hazardous Materials Management

The California Hazardous Materials Release Response Plans and Inventory Law of 1985 (Business Plan Act) requires that any business that handles hazardous materials prepare a business plan, which must include the following:

- Details, including floor plans, of the facility and business conducted at the site;
- An inventory of hazardous materials that are handled or stored on site;
- An emergency response plan; and
- A safety and emergency response training program for new employees with annual refresher courses.

Hazardous Waste Handling

The Cal EPA DTSC regulates the generation, transportation, treatment, storage, and disposal of hazardous waste. State and federal laws require detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of, and, in the event that such materials are accidentally released, to prevent or to mitigate injury to health or the environment. Laws and regulations require hazardous materials users to store these materials appropriately and to train employees to manage them safely.

Under the federal Resource Conservation and Recovery Act of 1976 (RCRA), individual states may implement their own hazardous waste programs in lieu of RCRA, as long as the state program is at least as stringent as federal RCRA requirements. In California, the DTSC regulates the generation, transportation, treatment, storage, and disposal of hazardous waste. The hazardous waste regulations establish criteria for identifying, packaging, and labeling hazardous wastes; prescribe management of hazardous waste; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous waste that cannot be disposed of in landfills.

Aboveground Storage of Petroleum Products

The Aboveground Petroleum Storage Act of 1990 requires facilities storing petroleum products in a single tank greater than 1,320 gallons, or facilities storing petroleum in aboveground tanks or

containers with a cumulative storage capacity of greater than 1,320 gallons, to file a storage statement with the SWRCB and prepare a spill prevention, control, and countermeasure plan. The plan must identify appropriate spill containment or equipment for diverting spills from sensitive areas, as well as discuss facility-specific requirements for the storage system, inspections, recordkeeping, security, and personnel training. The Project includes installation of a diesel-powered emergency back-up generator at the Project site, but because the capacity of the fuel tank associated with the generator does not exceed 1,320 gallons, these laws and regulations are not discussed in detail in this section.

Underground Storage Tanks

State laws governing USTs specify requirements for permitting, monitoring, closure, and cleanup of these facilities. Regulations set forth construction and monitoring standards for existing tanks, release reporting requirements, and closure requirements. Since the City of Sunnyvale is a Consolidated Unified Program Agency (CUPA), any entity proposing to remove a UST must submit a closure plan to the City prior to tank removal. Upon approval of the UST closure plan, the City would issue a permit, oversee removal of the UST, require additional subsurface sampling if necessary, and issue a site closure letter when the appropriate removal and/or remediation has been completed. There are no USTs associated with the Project.

Occupational Safety

The California Occupational Safety and Health Administration (Cal/OSHA) assumes primary responsibility for developing and enforcing workplace safety regulations in California. Because California has a federally approved OSHA program, it is required to adopt regulations that are at least as stringent as those found in Title 29 of the CFR.

Cal/OSHA regulations (Title 8 of the California Code of Regulations [CCR]) concerning the use of hazardous materials in the workplace require employee safety training, safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces hazard communication program regulations, which contain training and information requirements, including procedures for identifying and labeling hazardous substances, and communicating hazard information relating to hazardous substances and their handling. The hazard communication program also requires that Materials Safety Data Sheets be available to employees, and that employee information and training programs be documented. These regulations also require preparation of emergency action plans (escape and evacuation procedures, rescue and medical duties, alarm systems, and training in emergency evacuation).

State laws, like federal laws, include special provisions for hazard communication to employees in research laboratories, including training in chemical work practices. Specific, more detailed training and monitoring is required for the use of carcinogens, ethylene oxide, lead, asbestos, and certain other chemicals listed in 29 CFR. Emergency equipment and supplies, such as fire extinguishers, safety showers, and eye washes, must also be provided and maintained in accessible places.

Cal/OSHA, like Fed/OSHA includes extensive, detailed requirements for worker protection applicable to any activity that could disturb asbestos-containing materials, including maintenance, renovation, and demolition. These regulations are also designed to ensure that persons working near the maintenance, renovation, or demolition activity are not exposed to asbestos.

Emergency Response

California has developed an emergency response plan to coordinate emergency services provided by federal, State, and local government and private agencies. Responding to hazardous materials incidents is one part of this plan. The plan is administered by the State Office of Emergency Services, which coordinates the responses of other agencies.

Structural and Building Components

Numerous state and federal laws and regulations control exposure to asbestos, lead-based paint, and polychlorinated biphenyls. These regulations cover the demolition, removal, cleanup, transportation, storage, and disposal of asbestos and lead-containing material. Regulations also outline the permissible exposure limits, protective measures, monitoring, and compliance to ensure the safety of construction workers exposed to these materials.

Asbestos-Containing Materials

State laws and regulations prohibit emissions of asbestos from asbestos-related manufacturing, demolition, or construction activities; require medical examinations and monitoring of employees engaged in activities that could disturb asbestos; specify precautions and safe work practices that must be followed to minimize the potential for release of asbestos fibers; and require notice to federal and local governmental agencies prior to beginning renovation or demolition that could disturb asbestos.

For the San Francisco bay area, the Bay Area Air Quality Management District is vested by the California legislature with authority to regulate airborne pollutants, including asbestos, through both inspection and law enforcement, and is to be notified ten days in advance of any proposed demolition or abatement work. Cal/OSHA regulates asbestos removal to ensure the health and safety of workers removing asbestos-containing materials and also must be notified of asbestos abatement activities. The provisions that cover asbestos demolition and renovation are found the District Regulation 11, Rule 2.

Polychlorinated Biphenyls

The use and management of PCBs in electrical equipment is regulated pursuant to the Toxic Substances Control Act (40 CFR). Fluorescent lighting ballasts that contain PCBs, regardless of size and quantity, are regulated as hazardous waste and must be transported and disposed of as hazardous waste.

Lead and Lead-Based Paint

Title 22 CCR considers waste soil with concentrations of lead to be hazardous if it exceeds a total concentration of 1,000 parts per million (ppm) and a soluble concentration of 5 ppm. Both the federal and Cal/OSHA regulate all worker exposure during construction activities that involve lead-based paint. The Interim Final Rule found in 29 CFR Part 1926.62 covers construction work where employees may be exposed to lead during such activities as demolition, removal, surface preparation for re-painting, renovation, clean up and routine maintenance. The OSHA-specified method of compliance includes respiratory protection, protective clothing, housekeeping, hygiene facilities, medical surveillance, training, etc. The provisions that cover lead-based paint demolition activities are found in Title 17 CCR, Division 1, Chapter 8, Accreditation, Certification, and Work Practices for Lead-Based Paint and Lead Hazards and are administered by the California Department of Public Health.

Local

Soil and Groundwater Contamination

In Santa Clara County, remediation of contaminated sites is generally performed under the oversight of the Santa Clara County Department of Environmental Health, or in some instances, the RWQCB and/or the DTSC. At sites where contamination is suspected or known to have occurred, the site owner is required to perform a site investigation and perform site remediation, if necessary. Site remediation or development may also be subject to regulation by other agencies. For example, if a project required dewatering near a hazardous waste site, the project applicant might be required to obtain a permit from the municipal sewer agency before discharging the water to the sewer system, or a National Pollutant Discharge Elimination System permit from the RWQCB before discharging to the storm water collection system.

Municipal Code

The City of Sunnyvale Municipal Code specifies requirements related to the storage of hazardous materials. The Hazardous Materials Storage Ordinance (Title 20) specifies that a project applicant must submit a hazardous materials management plan (HMMP). The HMMP must include a facility storage map, hazardous materials inventory statement, monitoring program and information about emergency equipment.

Impacts and Mitigation Measures

Significance Criteria

The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the CEQA *Guidelines*. For this analysis, the Project would have a significant impact associated with hazards and hazardous materials on the environment if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;

- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 miles of an existing or proposed school;
- Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment;
- Be located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would result in a safety hazard for people residing or working in the project area;
- Be located within the vicinity of a private airstrip, would result in a safety hazard for people residing or working in the project area;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; and,
- Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Approach to Analysis

This impact analysis focuses on potential effects related to hazards and hazardous materials associated with the Project. The evaluation was performed in light of current conditions at the Project site, the environmental database and site investigation reports reviewed, applicable regulations and guidelines, anticipated Project construction activities, and hazardous materials investigation reports available online through regulatory agency databases.

Impacts related to the potential release of toxic air contaminants are discussed in Section 3.5, Air Quality.

In many cases, compliance with laws, regulations, and mandatory regulatory permits prescribe actions that reduce the adverse effects of Project implementation. Should Project impacts remain potentially significant under CEQA even after such actions are implemented, mitigation measures to reduce Project impacts to less-than-significant levels are proposed.

Based on the Project and its physical setting, the Project would not result in impacts related to the following significance criteria; these criteria will not be discussed in the impact analysis for the following reasons:

- **Be located on a site that is included on a list of hazardous materials sites compiled pursuant to government code Section 65962.5.** According to the environmental database review, the Project site is not included on any lists of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Therefore, this criterion is not applicable to the Project and is not discussed further.

- **Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 miles of an existing or proposed school**. The only anticipated hazardous emissions associated with the Project are toxic air contaminants contained in emissions from diesel engines. This issue is examined in Section 3.5, Air Quality.

- **Be located within an area covered by an airport land use plan or private airstrip, where such a plan has not been adopted, within an area covered by a public airport land use plan and would result in a safety hazard for people residing or working in the project area.** The Project site is not within an area covered by an airport land use plan, and is more than two miles from any public airport or private airstrip. The Project site is located approximately 2.1 miles from the nearest airfield, Moffett Airfield, and 3.5 miles from the nearest municipal airport, Mineta San Jose International Airport, and is well outside any airport plan area. Therefore, the Project would not interfere with airport operations or result in a safety hazard for people residing or working in the area.

- **Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.** Project construction could interfere with an adopted emergency response plan or emergency evacuation plan if construction activities involved the complete or partial closure of through roadways, interfered with identified evacuation routes, otherwise restricted access for emergency response vehicles, or restricted access to critical facilities such as hospitals or fire stations. The Project site is not situated in a way that would block access to any through roadways which could be used for emergency response or evacuation. The Santa Clara County Emergency Operations Plan (Santa Clara County, 2008) does not designate the Project site for use in emergency response or evacuation.

- **Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.** According to CAL FIRE fire hazard mapping, the Project site is not within areas designated as very high or high fire hazard zones (CAL FIRE, 2007). The Project site is in an urbanized area that is not adjacent to any wildland areas. Fire protection services are provided by the Sunnyvale Department of Public Safety Fire Services Bureau and all proposed construction would be constructed according to the current fire safety code requirements. Therefore, the Project would not be susceptible to wildland fires and there is no potential for an impact of this kind.

Impact Analysis

Impact HAZ-1: The Project could create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. (Less than Significant)

The Project would include construction activities that employ hazards or the use of hazardous chemicals, such as gasoline, diesel fuel, oils and lubricants, paints and thinners, solvents, and other chemicals. In addition, demolition activities could result in the release of asbestos-containing materials or lead-based paints. Project operation would involve the use of hazardous materials including the use of diesel fuel for an emergency back-up generator. Impacts would occur if construction-related activities or Project operation were to result in hazards or the release of hazardous materials and could be considered potentially significant.

In addition, the existing buildings on the Project site could contain hazardous building materials that, if not handled appropriately, could be released. For example, based on the age of the existing buildings, it can reasonably be presumed that asbestos-containing building materials (e.g., floor and ceiling tiles, mastic, pipe insulation, and the like) could be present, as could lead-based paint and fluorescent light ballasts with insulating oils that contain PCBs.

As described in the Regulatory Framework section, above, numerous federal, State, and local laws and regulations ensure the safe transportation, use, storage, and disposal of hazardous materials. This includes regulations for safe removal, handling, and disposal of asbestos-containing materials, lead-based paint, and insulating oils containing PCBs, all of which could be encountered during demolition of the existing buildings at the Project site. These regulations generally require the safe removal and disposal of hazardous building materials prior to structural demolition. Because the Project applicant and its contractors would be required to comply with all hazardous materials laws and regulations for the transport, use, and disposal of hazardous materials, the impacts associated with the potential to create a significant hazard to the public or the environment would be less than significant.

Ongoing commercial, industrial, and retail use as a result of the Project could involve the use of chemical compounds and products that are considered hazardous materials. Additional operation of the Project could require the transportation, use, and storage of additional quantities of hazardous materials to new businesses and entities. If not handled, stored, or transported appropriately, these impacts could be potentially significant. The handling and use of these hazardous materials, and the disposal of the resulting hazardous wastes would be required to follow the applicable laws and regulations, as described in *Regulatory Framework* above. As a result of these requirements, impacts resulting from hazardous materials and hazardous waste transport, use and disposal would be less than significant.

Mitigation: None required.

Impact HAZ-2: The Project could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. (Less than Significant)

The Project could require construction activities which would use certain hazardous materials such as gasoline, diesel fuel, oils, lubricants, solvents, and glues. Inadvertent release of these materials into the environment could adversely impact the public, or soil, surface waters, or groundwater quality. These impacts could be potentially significant.

However, it is anticipated that the hazardous materials used on a construction site would be used in accordance with manufacturer recommendations. Accidents or mechanical failure involving heavy equipment could result in the accidental release of small quantities of fuel, lubricants, hydraulic fluid, or other hazardous substances. These types of spills on construction sites are typically in small quantities, localized, and are cleaned up in a timely manner. Construction

contractors are responsible for their hazardous materials and are required under their contract to properly store and dispose of these materials in compliance with State and federal laws. As discussed in 3.10, Hydrology and Water Quality, the Project would require a Stormwater Pollution Prevention Plan (SWPPP), which outlines best management practices (BMPs) to avoid runoff of stormwater and pollutants. The BMPs would include protection measures to contain a potential release and to prevent any such release from reaching an adjacent waterway or stormwater collection system. These would minimize the potential adverse effects to groundwater and soils. Given the use of BMPs as required by the construction contractors, the threat of exposure to the public or contamination to soil and groundwater from construction-related hazardous materials is considered less than significant.

As previously discussed, operation of the Project would use a diesel-powered emergency back-up generator. This emergency back-up generator would be located in the Central Utilities Plant on the fifth floor of the parking garage. Use of this diesel-powered emergency back-up generator would not be continuous. It would only operate during emergencies or when being tested (typically, monthly). The generator would be permitted by the Bay Area Air Quality Management District and subject to the requirements of the City of Sunnyvale Fire Department and Fire Code, which includes limits on the capacity of diesel with the generator. With implementation of safety and control measures from the Fire Code needed for compliance with these regulatory requirements and other State regulations, impacts related to the use of diesel for the emergency back-up generator during Project operation would be less than significant. Air quality impacts resulting from the use of diesel generators are discussed in Section 3.5, *Air Quality*.

Mitigation: None required.

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3.12 Cultural Resources

This section provides an assessment of potential impacts of the Project on cultural resources. Cultural resources include historical resources, archaeological resources, paleontological resources, and human remains. Where impacts are determined to be significant, mitigation measures to reduce impacts to a less-than-significant level are identified.

Cultural Setting

Natural Environment

The Project site is located in the southern portion of the Coast Ranges geomorphic province, a series of northwest trending mountain ranges and valleys that stretch along the California coast from Santa Barbara north to the Oregon border (CGS, 2002). Sunnyvale is located in the northwestern part of the Santa Clara Valley, at the south end of San Francisco Bay. The hills surrounding the Santa Clara Valley are the source of many perennial streams, which run from the hills to the San Francisco Bay. The Project site is situated at approximately 50 feet above mean sea level and is relatively flat, but the vicinity gently slopes to the north-northeast. The shoreline of San Francisco Bay is located approximately three miles north of the Project site.

The Santa Clara Valley exhibits a Mediterranean climate, with year-round moderate temperatures, mild weather, and an average of 15 inches of rainfall per year. This type of climate is subject to recurring and sometimes long-lasting droughts.

The Bay Area and the surrounding region contain an abundance of natural resources, which would have been taken advantage of by its prehistoric population. The South Bay area hosts a wide variety of natural communities including salt marsh, scrub brush, grassland, and foothill woodlands. Deer, elk, and waterfowl were plentiful in prehistory, as were marine and Bay resources such as seals, otters, abalone, mussels, oysters, clams and numerous fish species. Franciscan chert was an easily obtainable local raw material for stone tools. Obsidian could be obtained from the Annadel and Napa Glass Mountain quarries north of the Bay Area.

Paleontological Setting

The Society of Vertebrate Paleontology (SVP) has established guidelines for the identification, assessment, and mitigation of adverse impacts on nonrenewable paleontological resources (SVP, 1995, 1996). Most practicing paleontologists in the United States adhere closely to the SVP's assessment, mitigation, and monitoring requirements as outlined in these guidelines, which were approved through a consensus of professional paleontologists and reflect the currently accepted standard practices. Many federal, state, county, and city agencies have either formally or informally adopted the SVP's standard guidelines for the mitigation of adverse construction-related impacts on paleontological resources. The SVP has helped define the value of paleontological resources and, in particular, indicates the following:

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

In accordance with these principles, the SVP (1995) outlined criteria for screening the paleontological potential of rock units and established assessment and mitigation procedures tailored to such potential. **Table 3.12-1** lists the criteria for high-potential, undetermined, and low-potential rock units.

TABLE 3.12-1
CRITERIA FOR DETERMINING PALEONTOLOGICAL POTENTIAL

Paleontological Potential	Description
High	Geologic units from which vertebrate or significant invertebrate or plant fossils have been recovered. Only invertebrate fossils that provide new information on existing flora or fauna or on the age of a rock unit would be considered significant.
Undetermined	Geologic units for which little to no information is available.
Low	Geologic units that are not known to have produced a substantial body of significant paleontological material.

SOURCE: SVP, 1995, 1996.

Although not discussed in the SVP standards, artificial fills, surface soils, and high-grade metamorphic rocks do not contain paleontological resources. While such materials were originally derived from rocks, they have been altered, weathered, or reworked such that the discovery of intact fossils would be rare.

Paleontological Potential

The surface soils of the Project site consist of Holocene-age alluvium and artificial fills. Holocene-age alluvium consists of loose deposits of sand, silt, and gravel. Known fossils from the Holocene of the greater Bay Area are sparse and represent common taxa. The University of California Museum of Paleontology (UCMP) database does not contain any examples of Holocene-age fossils from Santa Clara County (UCMP, 2013). Holocene units in California are typically considered to be of low sensitivity unless known otherwise. Based on the criteria in Table 3.12.1 above, the Holocene-age alluvium in the Project site is rated as having a low paleontological potential.

Geoarchaeological Context

The San Francisco Bay Area has undergone dramatic landscape changes since humans began to inhabit the region more than 13,000 years ago. Sea levels began rising about 15,000 years ago, at which time the coastline was located west of the Farallon Islands, and reached the present level of the Bay about 5,000 years ago (Helley and Graymer, 1997). This dramatic change in stream base-level resulted in increased deposition of sediment along the lower reaches of Bay Area streams. Gold Rush-era sedimentation has exacerbated this deposition over alluvial fans and within the Bay itself. Active alluvial fan deposits are generally less than 5,000 years old and overlie older land surfaces (including stabilized/abandoned Pleistocene-age alluvial fans). In many places, the interface between older land surfaces and active alluvial fans is marked by a well-developed buried soil profile, or a paleosol. Paleosols preserve the composition and character of the earth's surface prior to subsequent sediment deposition; thus, paleosols have the potential to preserve archaeological resources if the area was occupied or settled by humans. Because human populations have grown since the arrival of the area's first inhabitants, younger paleosols (late Holocene) are more likely to yield archaeological resources than older paleosols (early Holocene or Pleistocene). Numerous deeply buried archaeological sites have been uncovered in the Santa Clara Valley, at depths varying between one foot and more than ten feet below the ground surface. In fact, more than 60% of recorded archaeological sites in this region have been found in a buried context (Meyer and Rosenthal, 2007).

The Project site is located in an area mapped as Holocene-age alluvium (Witter et al., 2006); Holocene-age alluvium, as noted above, has a high potential to contain buried paleosols. A review of soil surveys prepared by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) indicates the soils at the Project site are designated Urban Land (NRCS, 2013). Soils classified as Urban Land units are paved areas or areas of disturbed land that display varying degrees of similarity to the sediments that would be located in areas under undisturbed conditions. The results of soil borings completed at the Project site (PES Environmental, Inc, 2013; Cunningham and Butler, 2013) indicate that surface pavements generally consist of 1 to 2¼ inches of asphalt concrete over 3 to 9 inches of aggregate base. Beneath the surface, explorations generally encountered deep alluvial deposits consisting of dark grayish brown clay with variable amounts of sand—consistent with the geologic mapping and soil surveys. Between 4 and 10 feet below the ground surface, more permeable sediments of sands and gravels were identified. Groundwater was reached at approximately 7 to 9 feet below the current surface.

The Project site is currently occupied by nine single-story commercial/research and development buildings surrounded by at-grade parking and landscaping. Construction of the existing building foundations disturbed the upper few feet from the ground surface; removal of the foundations would extend approximately 5 feet below ground surface. Removal or replacement of existing utilities would extend approximately 8 feet below ground surface. Piles to support new buildings could potentially be as deep as 40 feet. The base of foundations and pile caps would be approximately 15 feet deep. General ground disturbance throughout the site is expected to be approximately 5 feet deep with deeper excavations in limited locations.

The Northwest Information Center (NWIC) of the California Historical Resources Information System provided a project review records search for the Project site on May 23, 2013 (File No. 12-1401). A project review records search includes general information about a Project site but does not provide site specific information, records, or reports. The results of the project review indicate that the Project site does not have any record of cultural resources studies, recorded archaeological sites, or recorded historic buildings. Despite the negative results the NWIC noted that:

> Based on an evaluation of the environmental setting and features associated with known sites, Native American resources in this part of Santa Clara County have been found along the general margin of the bay and its associated wetlands, near sources of water (including perennial and intermittent springs and streams), and near the interface between the valleys and adjacent uplands. The proposed project area is located on a slight rise on the broad alluvial plains, approximately 4.5 kilometers from the former bay margin. In the general vicinity of the proposed project, several intermittent streams meandered across the landscape and at least one marsh or wetland was once located to the east of the proposed project area. The undifferentiated alluvial deposits that are located within the project area date from the Holocene and have been known to overlay archaeological material with sterile alluvium of varying depths. Given the potential for buried archaeological material, along with the general environmental and cultural setting, there is a moderate potential of identifying unrecorded Native American resources in the proposed project area [NWIC, 2013].

Based on the above archaeological sensitivity assessment in combination with the developed environment of the Project site, the NWIC recommended that prior to ground disturbance "the depths of impact for the proposed project be adequately determined to assess locations that have the potential to disturb sensitive landforms" (NWIC, 2013). Ground disturbing activity for the proposed Project will include demolition and removal of the existing buildings and pavement; and a general grading of the entire Project site that would disturb the upper 5 feet from the current ground surface. Project plans do not include deep excavations associated with the construction of basements or other underground features. All deep excavation (greater than 5 feet) will be restricted to localized pile driving and utility installation. All activities will be conducted entirely within areas that have been previously disturbed by land preparation and construction for the current buildings and infrastructure or by former agricultural uses. Buried archaeological materials within the first 2–3 feet of the surface would have been disturbed and rotated allowing for surface visibility of cultural materials.

The potential for buried paleosols beneath the upper few feet of the surface remains "moderate;" however, the distance from "the general margin of the bay and its associated wetlands…. sources of water (including perennial and intermittent springs and streams)… [or] the interface between the valleys and adjacent uplands" reduces the potential for cultural materials (i.e. archaeological sites) to be associated with paleosols. The Project site is located approximately 3 miles from the historic bay marsh shoreline, 1 mile southwest of the nearest known historic wetlands, 2.5 miles west and 4 miles east of the nearest historic watercourses, and 6.5 miles from the interface of the valley and adjacent uplands. While the potential for buried archaeological resources cannot be entirely discounted, based on the currently disturbed soils, the mostly obscured ground surface, and the proposed depth of ground disturbing activity, all combined with the moderate archaeological sensitivity, a subsurface geoarchaeological investigation does not appear warranted.

Prehistory

Archaeologists have developed individual cultural chronological sequences tailored to the archaeology and material culture of each subregion of California. Each of these sequences is based principally on the presence of distinctive cultural traits and stratigraphic separation of deposits. Milliken et al. (2007) suggest a framework for the interpretation of the San Francisco Bay Area. That research divides human history in California into three periods: the Early Period, the Middle Period, and the Late Period. Economic patterns, stylistic aspects, and regional phases further subdivide cultural patterns into shorter phases. This scheme uses economic and technological types, socio-politics, trade networks, population density, and variations of artifact types to differentiate between cultural periods.

The *Paleoindian Period* (13,500 to 10,000 before present [B.P.]) was characterized by big-game hunters occupying broad geographic areas. Evidence of human habitation during the *Paleoindian Period* has not yet been discovered in the San Francisco Bay Area. During the *Lower Archaic* of the *Early Period* (10,000 to 5500 B.P.), geographic mobility continued and is characterized by the presence of millingslabs and handstones as well as large wide-stemmed and leaf-shaped projectile points. The first cut shell beads and the mortar and pestle are documented in burials during the *Middle Archaic* of the *Early Period* (5500 to 2500 B.P.), indicating the beginning of a shift to sedentism.

During the *Middle Period*, which includes the *Lower Middle Period* (*Initial Upper Archaic*; 2500 to 1570 B.P.), and the *Upper Middle Period* (*Late Upper Archaic*; 1570 to 950 B.P.), geographic mobility may have continued, although groups began to establish longer-term base camps in localities from which a more diverse range of resources could be exploited. The first rich black middens are recorded from this period. The addition of milling tools, obsidian and chert concave-base projectile points, and the occurrence of sites in a wider range of environments suggest that the economic base was more diverse. By the *Upper Middle Period*, mobility was being replaced by the development of numerous small villages. Around 1570 B.P. a “dramatic cultural disruption” occurred evidenced by the sudden collapse of the *Olivella* saucer bead trade network. During the *Initial Late Period* (*Lower Emergent*; 950 to 450 B.P.), social complexity developed toward lifeways of large, central villages with resident political leaders and specialized activity sites. Artifacts associated with the period include the bow and arrow, small corner-notched projectile points, and a diversity of beads and ornaments.

Ethnography

Based on a compilation of ethnographic, historic, and archaeological data, Milliken (1995) describes a group known as the Ohlone, who once occupied the general vicinity of the Project site. While traditional anthropological literature portrayed the Ohlone peoples as having a static culture, today it is better understood that many variations of culture and ideology existed within and between villages. While these “static” descriptions of separations between native cultures of California make it an easier task for ethnographers to describe past behaviors, this masks Native adaptability and self-identity. California’s Native Americans never saw themselves as members of larger “cultural groups,” as described by anthropologists. Instead, they saw themselves as

members of specific villages, perhaps related to others by marriage or kinship ties, but viewing the village as the primary identifier of their origins.

Levy (1978) describes the language group spoken by the Ohlone, known as "Costanoan." This term is originally derived from a Spanish word designating the coastal peoples of Central California. Today Costanoan is used as a linguistic term that references to a larger language family spoken by distinct sociopolitical groups that spoke at least eight languages (as different as Spanish is from French) of the same Penutian language group. The Ohlone once occupied a large territory from San Francisco Bay in the north to the Big Sur and Salinas Rivers in the south. The Project site is in the greater *Puichon*-speaking tribal area, centered on San Francisquito Creek and Stevens Creek (Milliken et al., 2009).

Economically, Ohlone engaged in hunting and gathering. Their territory encompassed both coastal and open valley environments that contained a wide variety of resources, including grass seeds, acorns, bulbs and tubers, bear, deer, elk, antelope, a variety of bird species, and rabbit and other small mammals. The Ohlone acknowledged private ownership of goods and songs, and village ownership of rights to land and/or natural resources; they appear to have aggressively protected their village territories, requiring monetary payment for access rights in the form of clamshell beads, and even shooting trespassers if caught. After European contact, Ohlone society was severely disrupted by missionization, disease, and displacement. Today, the Ohlone still have a strong presence in the San Francisco Bay Area, and are highly interested in their historic and prehistoric past.

History

Spanish explorers in the late 1760s and 1770s were the first Europeans to traverse the Santa Clara Valley. José Francisco Ortega, a soldier in the exploring party of Gaspar de Portola and Juan Crespi, made the first recorded crossing of the Guadalupe River in the vicinity of present-day Alviso during November 1769 but no clear record remains of his exact route and his impressions of the area (Beck and Haase, 1974). Juan Bautista de Anza and Pedro Font led the next expedition through the area in early 1776, leaving a substantial record of their travels. The explorers commented on the level land and good pasturage, concluding that the area would be an excellent site for settlement (Bolton, 1930). Anza recorded three native villages in the vicinity of his campsite, each reportedly composed of approximately 70 persons. Anza noted some "paths and trails" heading to the south and concluded that the same tribe of Indians dwelled throughout the entire valley.

After an initial period of exploration, the Spanish focused on the founding of presidios, missions, and secular towns with the land held by the Crown. Following the favorable reports by Anza and Font, the Spanish moved to occupy the lands in the Santa Clara Valley founding both the Pueblo de San José and the Mission Santa Clara de Asis in 1777. The Pueblo of San José de Guadalupe was California's first civilian settlement, and one of three towns founded to administer and coordinate the missions and presidios of Alta California (Hendry and Bowman, 1940). By the late 18th century, the Embarcadero de Santa Clara at the mouth of the Guadalupe River into the San Francisco Bay had developed as a trading port and separate community. The Mission Santa Clara provided for the religious needs of the Pueblo and, as one of seven missions located within

Ohlone territory, would have been the mission with the greatest impact on the aboriginal population living in the Santa Clara Valley (Milliken, 1995).

After the independence of Mexico and the secularization of the missions in the 1830s, the mission's property was divided into ranchos and distributed to private citizens. The Project site was part of the Mexican land grant known as Rancho Pastoria de las Borregas, a 9,066-acre land grant deeded to Francisco Estrada in 1842. A few years later in 1849 Martin Murphy Jr. purchased half the rancho. The Ohlone and other Native Californians gradually left the now-secular missions, with many going to work as wage laborers on the ranchos, in mines, and in domestic positions. There was a partial return to aboriginal religious practices and subsistence strategies, but for the most part, the Ohlone culture was greatly diminished (Levy, 1978). Today, descendants of the Ohlone still live in the area and many are active in restoring their traditions and advocating for Native American issues.

After California became part of the United States in 1848, San José was initially (and temporarily) named the State's capital. In the 1850s, the Gold Rush led to major changes in San José, which became a supply town for the prospectors who flooded the area (NPS, 2013). The population of the Santa Clara Valley expanded as a result of the Gold Rush, followed later by the construction of the railroad to San Francisco (1864) and the completion of the transcontinental railroad in 1869. Former land grants were subdivided and sold to newcomers, with the Rancho Pastoria de las Borregas split between Murphy's children and grandchildren following his death in 1892 (Thompson and West, 1876). Real estate developer W.E. Crossman purchased 200 acres of land, which eventually became Sunnyvale in 1901 (NPS, 2013).

Historically, the Project site has been used for grazing and orchards. During the Spanish and Mexican periods, the lands within the Project site were likely used for cattle grazing, as part of the Rancho Pastoria de las Borregas. As the rancho was subdivided into increasingly smaller parcels following the annexation of California into the United States, fruit orchards were planted. Aerial photos indicate that orchards were located on the Project site from 1939 through 1956; by 1968 all the orchards had been cleared and the present buildings were constructed in the mid-1970s.

Cultural Resources Methods and Results

ESA conducted a records search for cultural resources at the NWIC of the California Historical Resources Information System on August 23, 2013 (File No. 13-0299). The purpose of the records search was to: (1) determine whether known cultural resources have been recorded within the vicinity of the Project site; (2) assess the likelihood for unrecorded archaeological resources to be present based on historical references and the distribution of nearby sites; and (3) develop a context for the identification and preliminary evaluation of archaeological resources. The records search consisted of an examination of the following documents:

- NWIC base maps (USGS 7.5-minute Mountain View and Cupertino, California topographic maps), to identify recorded archaeological sites and surveys within a ½-mile radius of the Project site.

- NWIC base maps (USGS 7.5-minute Mountain View, California topographic map), to identify recorded historic-period resources of the built environment (building, structures, and objects) within a ¼-mile radius of the Project site.

- The Office of Historic Preservation's Historic Properties Directory (updated April 2012) to identify California Historic Landmarks, California Points of Historic Interest, California Historical Resources, and Historic Properties that are listed in or determined eligible for listing in the NRHP.

- Available historic-period maps (*diseños* or Spanish/Mexican landgrant maps, General Land Office maps, 19th- and early-20th-century USGS 15- and 7.5-minute topographic maps, and Sanborn Company fire insurance maps) to identify historic-period buildings, structures, and objects located within or near the Project site.

The records search indicated that six cultural resources studies have been conducted within a ½-mile radius of the Project site (**Table 3.12-2**). Studies consisted of background research, surface surveys, and archaeological monitoring. Additional archaeological monitoring was recommended for S-8521 and S-32996; no report of monitoring for these projects is on file at the NWIC.

TABLE 3.12-2
CULTURAL RESOURCES INVESTIGATIONS WITHIN ½-MILE OF THE PROJECT SITE

Study No.	Title, Author, Year	Survey Type
S-8521	*Archaeological Reconnaissance of approximately 9 miles of Central Expressway, from De la Cruz Boulevard to San Antonio Road*, Flynn, September 1979.	Surface Survey
S-9538	*Draft Historic Property Survey of the Proposed Central Expressway Commuter Land Project located in the cities of Santa Clara, Sunnyvale, and Mountain View in Santa Clara County*. Anastasio and Garaventa, November 1987.	Surface Survey
S-10154	*Historic Property Survey of the Proposed Central Expressway Commuter Land Project located in the cities of Santa Clara, Sunnyvale, and Mountain View in Santa Clara County*. Anastasio and Garaventa, April 1988.	Surface Survey
S-32996	*Archaeological Resources Assessment – East Sunnyvale ITR Project, Santa Clara County.* Basin Research Associates, March 2006.	Surface Survey
S-36764	*Cultural Resources Records Search and Site Visit for T-Mobile West Corporation a Delaware corporation Candidate SF54275B (Sunnyvale Corporation Yard), 221 Commercial Street, Sunnyvale, Santa Clara County.* Williams, January 2010.	Surface Survey
S-37290	*AboveNet 440 North Wolfe Road Archaeological Monitoring.* Tietjen, August 2010.	Archaeological Monitoring

SOURCE: NWIC

No archaeological resources have been previously identified within the Project site. Two previously recorded archaeological sites have been identified within a ½-mile radius of the Project site. Both resources are located over 1,500 feet from the current Project site.

CA-SCL-9 was originally recorded as Site #343 by N.C. Nelson during his 1906–1908 survey of San Francisco Bay Area prehistoric shellmounds (Nelson, 1909). The site location relies on Nelson's ca. 1912 Map of San Francisco Bay Region showing Distribution of Shell Heaps and is

mapped in the vicinity of North Wolfe Road and South Britton Avenue. The site is described as an "occupation site." No other information is available regarding this resource. The site was not mentioned in a later Bay Area shellmound overview provided by UC Berkeley anthropologist L. L. Loud nor was it relocated during a recent survey effort (cited in Basin, 2006). Presence/absence testing and archaeological monitoring at the mapped location of the site was recommended (Basin Research Associates, 2006:14), however it is not certain whether these actions were completed as no record or reports relating to this work are on file at the NWIC.

Sometime prior to 1976, human remains (C-163, also called the "Sunnyvale Girl") were uncovered somewhere near the intersection of Kifer Road and North Wolfe Road at a depth of 9 feet below ground surface. Information about the remains are noted in a letter report citing personal communication with Dr. Bert Gerow from Stanford University (Roop, 1976). The human remains were reportedly found in a "natural shell deposit" that dated to approximately 10,000 years B.P. Dr. Gerow examined the remains and dated them to approximately 4,000–5,000 years B.P. An "antler wedge" was found approximately 100 feet east of the human remains in a similar soil deposit. That (potential) artifact was dated to be approximately 46,000 years B.P. however that has not been substantiated. The exact location of C-163 is not known; it was stressed in the 1976 communication that absolutely no surface indicators were evident. In 2010 ESA conducted archaeological monitoring during installation of fiber optic cable in the vicinity Kifer Road and North Wolfe Road near the mapped location of C-163 (Tietjen, 2010). No archaeological materials were identified during that monitoring. All soils observed were previously disturbed: 0–30 cm asphalt, 30–50 cm gravel road base, and 50+ cm disturbed very dark brown silty clay loam with gravel.

Regulatory Setting

Federal Regulations

Archaeological resources are protected through the National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470f), and its implementing regulations. Prior to implementing an "undertaking" (e.g., federal funding or issuing a federal permit), Section 106 of the NHPA requires federal agencies to consider the effects of the undertaking on historic properties (i.e., properties listed in or eligible for listing in the National Register of Historic Places [NRHP]) and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on any undertaking that would adversely affect properties eligible for listing in the NRHP. Under the NHPA, a property is considered significant if it meets the NRHP listing criteria at 36 CFR 60.4, as stated below:

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that:
>
> a) Are associated with events that have made a significant contribution to the broad patterns of our history, or
>
> b) Are associated with the lives of persons significant in our past, or
>
> c) Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that

represent a significant and distinguishable entity whose components may lack individual distinction, or

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

Federal review of projects is normally referred to as the Section 106 process. This process is the responsibility of the federal lead agency. The Section 106 review normally involves a four-step procedure, which is described in detail in the implementing regulations (36 CFR Part 800):

- Identify historic properties in consultation with the State Historic Preservation Officer (SHPO) and interested parties;
- Assess the effects of the undertaking on historic properties;
- Consult with the SHPO, other agencies, and interested parties to develop an agreement that addresses the treatment of historic properties and notify the Advisory Council on Historic Preservation; and finally,
- Proceed with the project according to the conditions of the agreement.

State Regulations

The State of California implements the NHPA of 1966, as amended, through its statewide comprehensive cultural resource surveys and preservation programs. The California Office of Historic Preservation, as an office of the California Department of Parks and Recreation (DPR), implements the policies of the NHPA on a statewide level. The Office of Historic Preservation also maintains the California Historical Resources Inventory. The SHPO is an appointed official who implements historic preservation programs within the State's jurisdictions.

California Register of Historical Resources

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

To be eligible for the CRHR a historical resource must be significant at the local, State, and/or federal level under one or more of the following criteria.

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2. Is associated with the lives of persons important in our past.
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4. Has yielded, or may be likely to yield, information important in prehistory or history (PRC §5024.1[c]).

For a resource to be eligible for the CRHR, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance. A resource that does not retain sufficient integrity to meet the NRHP criteria may still be eligible for listing in the CRHR.

Provisions for Paleontological Resource Protection

PRC §5097.5 prohibits "knowing and willful" excavation, removal, destruction, injury, and defacement of any paleontological feature on public lands (lands under State, county, city, district, or public authority jurisdiction, or the jurisdiction of a public corporation), except where the agency with jurisdiction has granted permission.

Effects on Human Remains

Under State law, human remains and associated burial items may be significant resources in two ways: they may be significant to descendent communities for patrimonial, cultural, lineage, and religious reasons; and human remains may also be important to the scientific community, such as prehistoric archaeologists, epidemiologists, and physical anthropologists. The specific stake of some descendent groups in ancestral burials is a matter of law for some groups, such as Native Americans (CEQA *Guidelines* §15064.5 (d), PRC §5097.98). In other cases, the concerns of the associated descendent group regarding appropriate treatment and disposition of discovered human burials may become known only through outreach. Beliefs concerning appropriate treatment, study, and disposition of human remains and associated burial items may be inconsistent and even conflict between descendent and scientific communities. CEQA and other State regulations concerning Native American human remains provide the following procedural requirements to assist in avoiding potential adverse effects to human remains within the contexts of their value to both descendent communities and the scientific community:

- When an initial study identifies the existence or probable likelihood that a project would impact Native American human remains, the lead agency is to contact and work with the appropriate Native American representatives identified through the Native American Heritage Commission (NAHC) to develop an agreement for the treatment and disposal of the human remains and any associated burial items (CEQA *Guidelines* §15064.5 [d], PRC §5097.98).

- If human remains are accidentally discovered, the county coroner must be contacted. If the county coroner determines that the human remains are Native American, the coroner must contact the NAHC within 24 hours. The NAHC must identify the most likely descendant (MLD) to provide for the opportunity to make recommendations for the treatment and disposal of the human remains and associated burial items. If the MLD fails to make recommendations within 48 hours of notification or the project applicant rejects the recommendations of the MLD, the Native American human remains and associated burial items must be reburied in a location not subject to future disturbance within the project site (PRC §5097.98).

- If potentially affected human remains/burial may have scientific significance, whether or not having significance to Native Americans or other descendent communities, then under CEQA, the appropriate mitigation of effect may require the recovery of the scientific information of the remains/burial through identification, evaluation, data recovery, analysis, and interpretation (CEQA *Guidelines* §15064.5[c][2]).

Impacts and Mitigation Measures

The CEQA *Guidelines* define a historical resource as: (1) a resource in the CRHR; (2) a resource included in a local register of historical resources, as defined in PRC §5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC §5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

If a lead agency determines that an archaeological site is a historical resource, the provisions of PRC §21084.1 and CEQA *Guidelines* §15064.5 would apply. If an archaeological site does not meet the CEQA *Guidelines* criteria for a historical resource, then the site may meet the threshold of PRC §21083 regarding unique archaeological resources. A unique archaeological resource is "an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria.

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.

3. Is directly associated with a scientifically recognized important prehistoric or historic event or person" (PRC §21083.2 [g]).

The CEQA *Guidelines* note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of the project on that resource shall not be considered a significant effect on the environment (CEQA *Guidelines* §15064[c][4]).

Thresholds of Significance

For the purposes of this EIR, an impact related to cultural resources is considered significant if implementation would:

- Cause a substantial adverse change in the significance of a historical resource as defined in CEQA *Guidelines* §15064.5;

- Cause a substantial adverse change in the significance of an archaeological resource that qualifies as a historical resource pursuant to CEQA *Guidelines* §15064.5[a], or as a unique archaeological resource as defined in PRC §21083.2;

- Directly or indirectly destroy a unique paleontological resource or site or unique geological feature; or

- Disturb any human remains, including those interred outside of formal cemeteries.

Approach to Analysis

Architectural Resources

Potential impacts on architectural resources are assessed by identifying any activities such as new construction, demolition, or substantial alteration that could impact resources that have been identified as historical resources for the purposes of CEQA. Individual properties and districts identified as historical resources under CEQA include those that are significant because of their association with important events, people, or architectural styles or master architects, or for their informational value (CRHR Criteria 1, 2, 3, and 4) and that retain sufficient historic integrity to convey their significance. Criterion 4, however, is typically applied to the evaluation of archaeological resources and not to architectural resources, as described below. Once a resource has been identified as significant, it must be determined whether the impacts of a project would "cause a substantial adverse change in the significance" of the resource (CEQA *Guidelines* §15064.5[b]). A substantial adverse change in the significance of a historical resource means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of [the] historical resource would be materially impaired" (CEQA *Guidelines* §15064.5[b][1]). A historical resource is materially impaired through the demolition or alteration of the resource's physical characteristics that convey its historical significance and that justify its inclusion in (or eligibility for inclusion in) the CRHR or a qualified local register (CEQA *Guidelines* §15064.5[b][2]).

Archaeological Resources

The significance of most prehistoric and historic-period archaeological sites is usually assessed under CRHR Criterion 4. This criterion stresses the importance of the information potential contained within the site, rather than its significance as a surviving example of a type or its association with an important person or event. Archaeological resources may qualify as historical resources under the definition provided in CEQA *Guidelines* §15064.5[a], or they may also be assessed under CEQA as unique archaeological resources, defined as archaeological artifacts, objects, or sites that contain information needed to answer important scientific research questions (PRC §21083.2). A substantial adverse change in the significance of an archaeological resource is assessed similarly to other historical resources, i.e., by destroying or materially altering in an adverse manner those physical characteristics of the resource that convey its significance under the appropriate criteria (CEQA *Guidelines* §15064.5[b][2]).

Paleontological Resources

A unique paleontological resource includes fossils that qualify as significant under the SVP criteria outlined in the Setting section.

Human Remains

Human remains, including those buried outside of formal cemeteries, are protected under several State laws, including PRC §5097.98 and Health and Safety Code §7050.5, identified above in the discussion of State Regulations, above. This analysis considers impacts including intentional disturbance, mutilation, or removal of interred human remains.

Impact Analysis

Impact CUL-1: The Project could cause a substantial adverse change in the significance of a historical resource. (Less than Significant)

CEQA *Guidelines* §15064.5 requires the lead agency to consider the effects of a project on historical resources. A historical resource is defined as any building, structure, site, or object listed in or determined to be eligible for listing in the CRHR, or determined by a lead agency to be significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, or cultural annals of California. Archaeological resources, including archaeological resources that are potentially historical resources according to CEQA *Guidelines* §15064.5, are addressed in Impact CUL-2 below.

No architectural resources that would qualify as historical resources were identified at the Project site or in the immediate vicinity. As such, the proposed Project would have no direct or indirect impact on historical resources of the built environment and no mitigation is required.

Mitigation: None required.

Impact CUL-2: The Project could cause a substantial adverse change in the significance of an archaeological resource. (Significant)

The following impact discussion will focus on archaeological resources, both as historical resources according to CEQA *Guidelines* §15064.5(a) or as unique archaeological resources as defined in PRC §21083.2(g).

No archaeological sites have been identified within the Project site. However, ground visibility is limited and many archaeological sites in this region are buried several feet below the ground surface. The records search identified two prehistoric archaeological resources previously recorded within a ½-mile radius of the Project site. One site (CA-SCL-9) is categorized as an "occupation site" and the other resource (C-163) is reported human remains. The exact location of both resources is uncertain based on the available data. CA-SCL-9 would have been visible from the surface based on the surface survey strategy of N.C. Nelson; C-163 was identified in a buried context. While the geologic framework of the Project site indicates there is a moderate potential for buried paleosols, previous Project site disturbance and distance from natural features reduce the archaeological sensitivity.

As discussed in the Geoarchaeological Context above, ground disturbing activity for the proposed Project would include demolition and removal of the existing buildings and pavement; and a general grading of the entire Project site that would disturb the upper 5 feet from the current ground surface. Project plans do not include deep excavations associated with the construction of basements or other underground features. All deep excavation (greater than 5 feet) would be restricted to localized pile driving and utility installation. All activities would be conducted

entirely within areas that have been previously disturbed by land preparation and construction for the current buildings and infrastructure or by former agricultural uses. Buried archaeological materials within the first 2–3 feet of the surface would have been disturbed and rotated allowing for surface visibility of cultural materials.

Despite the disturbed geologic context and depth of excavation proposed for the Project, the potential for buried archaeological resources to be uncovered during Project ground disturbing activities cannot be entirely discounted. Causing a substantial adverse change in the significance of an archaeological resource would be a significant impact.

Mitigation Measure

Mitigation Measure CUL-2: Archaeological Monitoring Program. Prior to authorization to proceed, or issuance of grading permits, an archaeologist meeting the Secretary of the Interior's Qualification Standards (qualified archaeologist) shall prepare an archaeological monitoring plan. The plan shall include (but not be limited to) the following issues:

- Training program for all construction and field workers involved in ground disturbance;
- Person(s) responsible for conducting monitoring activities, including Native American monitor(s), if deemed necessary;
- Person(s) responsible for overseeing and directing the monitors;
- How the monitoring shall be conducted and the required format and content of monitoring reports;
- Schedule for submittal of monitoring reports and person(s) responsible for review and approval of monitoring reports;
- Protocol for notifications in case of encountering cultural resources, as well as methods for evaluating significance, developing and implementing plan to avoid or mitigate significant resource impacts, Native American participation and consultation, collection and curation plan, and consistency with applicable laws including California Health and Safety Code §7050.5 and PRC §5097.98;
- Methods to ensure security of cultural resources sites if identified;
- Protocol for notifying the City of Sunnyvale, Native Americans, and local authorities (i.e. Sheriff, Police) should site looting and other illegal activities occur during construction with reference to PRC §5097.99.

Monitoring shall be conducted following removal of the existing buildings and during initial grading of the Project site as well as during all deep (greater than 5 feet) ground disturbing activities. During the course of the monitoring, the qualified archaeologist may adjust the frequency—from continuous to intermittent—of the monitoring based on the conditions and professional judgment regarding the potential to impact resources.

If prehistoric or historic-period cultural materials are encountered, all construction activities within 100 feet shall halt and the Project applicant and the City of Sunnyvale shall be notified. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally

darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-period materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse.

If the find is determined to be potentially significant qualifying as either a historical resource pursuant to CEQA *Guidelines* §15064.5 or as a unique archaeological resource as defined by PRC §21083.2, the archaeologist in consultation with the City of Sunnyvale and the appropriate Native American representative shall determine whether preservation in place is feasible. Consistent with CEQA *Guidelines* §15126.4(b)(3), preservation in place may be accomplished through planning construction to avoid the resource; incorporating the resource within open space; capping and covering the resource; or deeding the site into a permanent conservation easement. If avoidance is not feasible, a qualified archaeologist, in consultation with the City of Sunnyvale and the appropriate Native American representative, shall prepare and implement a detailed Archaeological Research Design and Treatment Plan (ARDTP). Treatment of unique archaeological resources shall follow the applicable requirements of PRC §21083.2. Treatment for most resources would consist of (but would not be not limited to) sample excavation, artifact collection, site documentation, and historical research, with the aim to target the recovery of important scientific data contained in the portion(s) of the significant resource to be impacted by the Project. The ARDTP shall include provisions for analysis of data in a regional context, reporting of results within a timely manner and subject to review and comments by the appropriate Native American representative before being finalized, curation of artifacts and data at a local facility acceptable to the appropriate Native American representative, and dissemination of final confidential reports to the appropriate Native American representative, the Northwest Information Center of the California Historical Resources Information System, the City of Sunnyvale, and interested professionals.

Significance after Mitigation: ***Less than Significant.*** Implementation of Mitigation Measure CUL-2 would reduce this impact to a less-than-significant level by requiring a Secretary of the Interior-qualified archaeologist to develop an Archaeological Monitoring Program prior to Project implementation so that in the event of an archaeological discovery, the resource is evaluated and treated appropriately.

Impact CUL-3: The Project could directly or indirectly destroy a unique paleontological resource or site or unique geological feature. (Less than Significant)

Based on the current analysis, the paleontological sensitivity at the Project site is considered to be low. Therefore, the potential impact to paleontological resources would be considered less than significant and no mitigation is required.

Mitigation: None required.

Impact CUL-4: The Project could disturb human remains, including those interred outside of formal cemeteries. (Significant)

While no discoveries of human remains have been documented within the Project site, the possibility of inadvertently uncovering human remains, especially given the archaeological sensitivity of the general area, cannot be entirely discounted. The disturbance of human remains during Project ground disturbing activities would be a significant impact. Implementation of **Mitigation Measure CUL-4** would reduce this impact to less than significant by ensuring that if human remains are uncovered during Project implementation the Most Likely Descendant would be contacted and the remains would be treated appropriately.

Mitigation Measure

Mitigation Measure CUL-4: Inadvertent Discovery of Human Remains. In the event of discovery or recognition of any human remains during construction activities, such activities within 100 feet of the find shall cease. The Santa Clara County Coroner shall be contacted immediately. The Coroner will determine if the remains are Native American. If the remains are determined to be Native American, and no investigation of the cause of death is required, the NAHC will be contacted within 24 hours. The NAHC will then identify and contact the person or persons it believes to be the MLD of the deceased Native American(s), who in turn would make recommendations to the Project applicant and the City of Sunnyvale for the appropriate means of treating the human remains and any grave goods.

Significance after Mitigation: ***Less than Significant.*** Mitigation Measure CUL-4 would ensure that impacts to human remains would be less than significant.

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3.13 Utilities and Service Systems

Introduction

This section discusses existing utilities and service systems within the City of Sunnyvale, focusing on those that serve the Project site, including water service (potable and non-potable), wastewater collection and treatment, stormwater and drainage, solid waste collection and disposal, energy (electricity and natural gas), and telecommunications. This section also describes potential impacts of the Project to existing water and wastewater service, and solid waste facilities. Such impacts may occur if the Project would increase demand for these services beyond their existing capacity.

Environmental Setting

Potable Water Supply

Local

The City of Sunnyvale Environmental Services Department, Water Section, supplies water to the majority of the City, including the Project site. The City obtains potable water from three different sources: purchased surface water from the San Francisco Public Utilities Commission (SFPUC), purchased treated water from the Santa Clara Valley Water District (SCVWD) and groundwater from seven wells owned and operated by the City of Sunnyvale (City of Sunnyvale, 2011a).

The SFPUC water supply is predominantly from the Sierra Nevada, delivered through the Hetch Hetchy aqueducts but also includes water produced by the SFPUC from its local watersheds and facilities in Alameda and San Mateo Counties. The City is one of SFPUC's many wholesale customers. The business relationship between the SFPUC and the City is largely defined by the "Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County and Santa Clara County" entered into in July 2009. The City has an Individual Supply Guarantee of 12.58 million gallons per day (mgd). Although the Water Supply Agreement and accompanying Water Supply Contract expire in 2034, the Individual Supply Agreement (which quantifies San Francisco's obligation to supply water to its individual wholesale customers) survives their expiration and continues indefinitely. The Sunnyvale contract also includes an Individual Supply Allocation of 9.44 mgd thru 2018, and a minimum purchase amount of 8.93 mgd, which the City agrees to buy, regardless of whether sales drop below this level (City of Sunnyvale, 2011a).

SCVWD supplies the City of Sunnyvale with treated surface water through an entitlement of imported Central Valley Project (CVP) water and the State Water Project (SWP), as well as surface water from local reservoirs. The current 75-year contractual agreement between the City and SCVWD went into effect in 1976 and sunsets in 2051. Imported water is conveyed through the Sacramento-San Joaquin Delta then pumped and delivered to Santa Clara County through

three main pipelines: the South Bay Aqueduct, which carries water from the SWP, and the Santa Clara Conduit and Pacheco Conduit, which bring water from the federal CVP. SCVWD has a contract for 100,000 acre-feet per year (afy) from the SWP and 154,500 afy from the CVP. While much of the supply is used for municipal and industrial needs, actual amount of water delivered is typically significantly less than these contracted amounts and depends on availability, conveyance limitations, and environmental regulations (City of Sunnyvale, 2011a).

The City of Sunnyvale also has seven operating groundwater wells and one well on stand-by for emergencies. These wells are used by the City as a supplemental source to the imported SFPUC and SCVWD water supplies. Historically, the wells produced more than 8,000 afy. Water demand has been reduced due to conservation, building code changes and manufacturing operations moving out of state and overseas. As a result, the City now utilizes treated water supplied by SFPUC and SCVWD first to meet its take-or-pay contract provisions before using groundwater. Groundwater production is estimated at 1,000 afy in the long-term. Groundwater is expected to be used to meet customer demands in the event SFPUC or SCVWD supplies are disrupted (City of Sunnyvale, 2011a).

Distribution Network within Project Site

The Project site is currently served by 10-inch potable water mains that run beneath North Wolfe Road, East Arques Avenue, and a loop at Santa Ana Court which connects through the Project site to North Wolfe Road. City Water and Sewer Division staff reviewed site records and found that potable water demand at the Project site has recently been about 38 afy, equivalent to about 34,000 gallons per day (gpd) (City of Sunnyvale, 2013d). The Project site is currently not served by a recycled water connection.

Wastewater

Wastewater Treatment

Wastewater from Sunnyvale is collected and conveyed to the City's Donald M. Somers Water Pollution Control Plant (WPCP) located at 1444 Borregas Avenue, adjacent to the Guadalupe Slough along the southern shoreline of the San Francisco Bay. The plant was constructed in 1955 and utilizes primary, secondary and tertiary treatment processes to treat incoming wastewater and has a treatment capacity of 29.5 mgd. On average, the plant receives approximately 15 mgd of influent (Hydroscience, 2013). As the WPCP has served the City for over 50 years and facilities are reaching the end of their useful life, the City is undergoing a master planning effort to reduce potential risks caused by aging infrastructure and outdated equipment at the plant.

The City's sanitary sewer collection system consists of 283 miles of gravity sewers, five sewer lift (pump) stations, and over two miles of sewer force mains. The sewer mains range in size from 6 to 42 inches in diameter.

On-site Wastewater Transmission and Collection Facilities

The Project site is currently served by a 10-inch sewer main on Santa Ana Court which runs north and connects to a 10-inch main at East Arques Avenue. Existing sewer demands from the Project site are approximately 23,875 gpd, equivalent to 0.024 mgd (BKF Engineers, 2014).

Stormwater

The City of Sunnyvale is responsible for controlling stormwater pollution by complying with the Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) permit issued by the San Francisco Bay Regional Water Quality Control Board (No. CAS612008). The Municipal Regional Permit (MRP) requires the City to prevent the discharge of non-stormwater (materials other than rain water) from entering the municipal storm drain system and San Francisco Bay. In compliance with the MRP, the City requires major development and redevelopment projects to implement best management practices (BMPs) to control stormwater. BMPs are detailed in a Stormwater Management Plan, which is typically reviewed by the City during the planning review and building permit review processes (City of Sunnyvale, 2011b). To facilitate compliance with the MRP, the City developed the *Storm Water Quality Best Management Practices Guidance Manual*, intended to guide project applicants and City staff in the preparation, review and approval of new and redevelopment projects according the current requirements of the MRP (City of Sunnyvale, 2011d).

As part of its implementation of the MRP, the City works with a variety of other municipalities, regulatory agencies, special districts and other stakeholders to promote watershed protection and urban runoff management, such as the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) and the Santa Clara Basin Watershed Management Initiative.

The City’s Division of Public Works oversees and maintains the storm drainage system within the City limits. The City’s stormwater collection system consists of over 300 miles of collection lines up to 84 inches in diameter, with two pumping stations that discharge storm water runoff to Guadalupe Slough.

Recycled Water

The WPCP provides approximately 13 mgd of high-quality advanced secondary treated water. A portion of this water is treated to disinfected tertiary standards and is supplied to a variety of non-potable uses within the City, including irrigation of parks, golf courses and landscaped areas. The City operates a separate distribution network of pipelines in the northern portion of the City solely for the distribution of recycled water (City of Sunnyvale, 2013a). Its current recycled water system consists of a WPCP pump station, the San Lucar Tank and Pump Station, the Sunnyvale Golf Course pump station, and approximately 19 miles of recycled water pipelines ranging in diameter from 6- to 36-inches. The City has a long-term goal of reusing 100% of all wastewater (approximately 15 mgd) generated from the WPCP to reduce discharges to South San Francisco Bay. Although the Project site is currently not served by a recycled water supply system (BKF Engineers, 2013), a recycled water transmission line runs beneath North Wolfe Road just west of the Project site (Hydroscience, 2013).

Solid Waste

The City contracts with Specialty Solid Waste and Recycling to provide solid waste collection services to the residents and businesses in the city. Collected waste is transported to the Sunnyvale Materials Recovery and Transfer Station (SMaRT Station) where it is sorted. The SMaRT Station is operated by Bay Counties Waste Services and also serves the cities of Mountain View and Palo Alto. Recyclable materials are diverted by the materials recovery facility and the unrecycled portion of the waste stream is transferred to the Kirby Canyon Class III Landfill, located in San Jose. In addition to the Kirby Canyon Landfill, some solid waste generated in Sunnyvale is disposed of at the Potrero Hills Landfill, the Zanker Road Landfill, and other disposal sites around the State. **Table 3.13-1** summarizes the permitted daily capacity, estimated remaining capacity and estimated closure date for these facilities.

TABLE 3.13-1
SOLID WASTE TRANSFER AND DISPOSAL FACILITIES

Facility	Permitted Daily Capacity (tons/day)	Estimated Remaining Capacity (CY)	Estimated Closure Date
SMaRT Station	1,500	N/A	N/A
Kirby Canyon Landfill	2,600	57,271,507	12/31/2022
Potrero Hills Landfill	4,330	13,872,000	2/14/2048
Zanker Road Landfill	1,300	700,000	N/A

SOURCE: CalRecycle, 2013a, 2013b, 2013c, and 2013d

Regulatory Framework

This section briefly describes State and local plans and policies related to the adequate provision and protection of utilities.

State Regulations

Urban Water Management Planning Act

The Urban Water Management Plan Act requires every urban water supplier that either provides over 3,000 acre-feet of water annually or serves more than 3,000 or more connections to prepare an Urban Water Management Plan (UWMP) which assesses the reliability of its water sources over a 20-year planning horizon considering normal, dry, and multiple dry years. The City's 2010 UWMP, prepared in June 2011, provides an overview of the City's water supply sources and usage, projected water demands, and recycled water and conservation programs. UWMPs must be updated every five years pursuant to the Urban Water Management Planning Act.

Senate Bill 610

Senate Bill (SB) 610, codified as Sections 10910-10915 of the California Water Code, requires the preparation of a Water Supply Assessment (WSA) for large-scale development projects proposing over 500 housing units, 250,000 square feet of commercial office space (or more than

1,000 employees), a shopping center or business establishment with over 500,000 square feet (or more than 1,000 employees), or equivalent usage. The WSA report evaluates the water supply available for new development based on the anticipated demand. For the broad range of projects that are subject to this law, the WSA must be requested by the lead agency from the local water provider (in this case the City of Sunnyvale), at the time the lead agency determines whether an EIR is required for the project. The water agency must then provide the assessment within 90 days, but may request a time extension under certain circumstances. The WSA must include specific information including an identification of existing water supply entitlements and contracts. The governing board of the water agency must approve the assessment at a public meeting.

California Integrated Waste Management Act of 1989, SB 1016, and AB 341

The California Integrated Waste Management Act of 1989, or Assembly Bill (AB) 939, established the California Integrated Waste Management Board (whose responsibilities have since been taken over by CalRecycle), required the implementation of integrated waste management plans and also mandated that local jurisdictions divert at least 50% of all solid waste generated (from 1990 levels), beginning January 1, 2000, and divert at least 75% by 2010.

SB 1016 updated the local jurisdiction diversion requirements in 2006. The new per capita disposal and goal measurement system moves the emphasis from an estimated diversion measurement number to using an actual disposal measurement number as a factor, along with evaluating program implementation efforts. These two factors will help determine each jurisdiction's progress toward achieving its Integrated Waste Management Act diversion goals. To meet the 50% waste reduction mandate, the City of Sunnyvale has a per capita disposal target of 5.0 pounds per person per day for residents and 8.3 pounds per person per day for employees. In 2011 (the most recent year for which data is available) the measured disposal rate for the City of Sunnyvale was 3.4 pounds per person per day for residents and 5.8 pounds per person per day for employment (CalRecycle, 2013e). The City diverted approximately 67% of its solid waste in 2011 (City of Sunnyvale, 2013c).

Passed in 2011, California’s Mandatory Commercial Recycling Law, AB 341, establishes a policy goal for California that not less than 75% of the solid waste generated is source-reduced, recycled or composted by 2020. In addition, AB 341 requires that businesses and public entities that generate four cubic yards or more of waste per week and multifamily entities with five units or more arrange for recycling services. The purpose of this new law is to reduce greenhouse gas emissions by diverting commercial solid waste from landfills and expand opportunities for recycling in California (CalRecycle, 2012 and 2013g).

California Code of Regulations Title 24

The State of California regulates energy consumption under Title 24 of the California Code of Regulations. The Title 24 Building Energy Efficiency Standards were developed by the California Energy Commission (CEC) and apply to energy consumed for heating, cooling, ventilation, water heating and lighting in new residential and non-residential buildings. The CEC

updates these standards periodically and adopted the latest standards in 2008; 2013 standards will become effective in January 2014. These standards establish lighting zones that differentiate the amount of outdoor lighting by geographical location, and establish new performance standards for residential lighting.

Local Plans and Policies

County of Santa Clara

As described in Section 3.10, *Hydrology*, construction activities associated with the proposed Project would be subject to the NPDES permit requirements for stormwater management and discharges. The SCVURPPP NPDES permit incorporates updated State and federal requirements related to the quantity and quality of post-construction stormwater discharges from new development and redevelopment projects. The stormwater system at the Project site would be regulated under the NPDES permit. In particular, Provision C.3 in the NPDES permit governs storm drain systems and regulates post-construction stormwater runoff. The provision requires new development and redevelopment projects to incorporate treatment measures and other appropriate source control and site design features to reduce the pollutant load in stormwater discharges and to manage runoff flows. “Redevelopment” is defined as a project on a previously developed site that results in the addition or replacement of impervious surface. A redevelopment project that adds or replaces at least 10,000 square feet of impervious surface is required to adhere to the C.3 provisions. The proposed Project would replace more than 10,000 square feet of impervious surface, and would therefore be required to incorporate treatment measures and appropriate source control and site design measures under the NPDES permit.

City of Sunnyvale

City of Sunnyvale General Plan

Policies from the City’s 2011 General Plan that relate to utilities are listed below (City of Sunnyvale, 2011c).

- **Goal EM-1: Adequate Water Supplies.** Acquire and manage water supplies so that existing and future reasonable demands for water, as projected in the 20-year forecast are reliably met.
    - ***Policy EM-1.2*****:** Maximize recycled water use for all approved purposes both within and in areas adjacent to the City, where feasible.
- **Goal EM-5: Minimal Pollution and Quantity of Wastewater.** Ensure that the quantity and composition of wastewater generated in the City does not exceed the capabilities of the wastewater collection system or and the water pollution control plant.
- **Goal EM-6: Effective Wastewater Collection System.** Continue to operate and maintain the wastewater collection system so that all sewage and industrial wastes generated within the City are collected and conveyed under safe and sanitary conditions to the water pollution control plant.
- **Goal EM-7: Effective Wastewater Treatment.** Continue to operate and maintain the water pollution control plant, using cost effective methods, so that all sewage and industrial

wastes generated within the City receive sufficient treatment to meet the effluent discharge and receiving water standards of regulatory agencies.

- **Goal EM-9: Adequate Storm Drain System.** Maintain storm drain system to prevent flooding.
- **Goal EM-10: Reduced Runoff and Pollutant Discharge.** Minimize the quantity of runoff and discharge of pollutants to the maximum extent practicable by integrating surface runoff controls into new development and redevelopment land use decisions.
- **Goal EM-14: Recycling and Source Reduction Programs.** Reduce solid waste through recycling, source reduction, education and special programs.
- **Goal EM-15: Environmentally-Sound Disposal.** Dispose of solid waste in an environmentally sound, dependable and cost-effective manner.

City of Sunnyvale 2008 Zero Waste Policy and Zero Waste Strategic Plan

In 2008, the City adopted a Zero Waste Policy that calls for a reduction in the amount of waste being disposed, as well as efforts to minimize upstream impacts on materials through sustainable manufacturing and consumerism. The Zero Waste Strategic Plan recommends three progressive goals to achieving zero waste: 70% diversion by 2015; 75% diversion by 2020; and 90% by 2030 (City of Sunnyvale, 2013c). The City's 2020 diversion rate goal of 75% parallels California Department of Resources Recycling and Recovery's (CalRecycle) goal of 75% statewide recycling by 2020.

City of Sunnyvale Demolition Permit

The City of Sunnyvale's Building Division requires applicants to obtain a demolition permit for removal of entire buildings and structures prior to the start of any demolition activities. As part of the demolition permitting process, applicants are required to follow a list of general requirements based on the 2010 California Green Building Code and the Sunnyvale Municipal Code. A portion of the requirements include consideration of deconstructing (i.e., building dismantling) and/or salvage of reusable building materials to minimize the amount of demolition materials disposed of (City of Sunnyvale, 2013b).

Impacts and Mitigation measures

Thresholds of Significance

Consistent with CEQA *Guidelines* Appendix G (Environmental Checklist) the Project could have a significant impact if it would:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;

- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Result in insufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed;
- Result in a determination by the wastewater treatment provider (which serves or may serve the project) that it lacks adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs; or
- Not comply with federal, state, and local statutes and regulations related to solid waste.

Approach to Analysis

This impact discussion assesses potential impact on utilities and service systems as it relates to the Project, describes adverse impacts that would result from implementation and projected buildout, and recommends mitigation measures as appropriate.

The potable water supply and wastewater demands that would be generated by the Project were calculated and compared to the existing demand for utility services by BKF Engineers (BKF Engineers, 2013 and 2014). Using projected utility demands, the net increases in utility usage associated with implementation of the Project were determined. The section addresses potential impacts related to the construction of new water and wastewater treatment, and storm water drainage facilities. In addition, this section evaluates the potential for the Project to result in temporary adverse impacts on landfill capacity due to the disposal of Project-generated demolition debris and construction waste as well as operational impacts on landfill capacity once Project construction is completed.

Impact Analysis

Impact UTL-1: Wastewater produced by the Project could exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board. (Less than Significant)

The City's WPCP is permitted by the RWQCB and effluent is regularly monitored to ensure that water quality standards are not violated. There have been no violations of water quality standards by the treatment plant in recent years, and there are no RWQCB enforcement actions pending against the City (SWRCB, 2013).

The Sunnyvale WPCP currently receives approximately 15 mgd, and has approximately 14.5 mgd of remaining capacity. Therefore, the projected wastewater flows of up to 38,287 gpd that would be generated by the Project can be accommodated with remaining capacity. Although this projected wastewater flow demand constitutes an approximately 67% increase from existing wastewater flow demands generated at the Project site (BKF Engineers, 2014), wastewater generated by the Project would not contain any unusual pollutants, and would be within the

existing capacity and permitted discharge volume of the treatment plant. The Project applicant would replace the existing 10-inch sewer pipeline that currently serves the Project site with a new 8-inch pipeline at the western driveway on East Arques Avenue (BKF Engineers, 2014). Since wastewater generated by the Project would not contain any unusual pollutants and because there is adequate capacity to treat the additional wastewater that would result from the Project, the Project would not cause any change in the quality of treated effluent discharged to the San Francisco Bay, nor would it change the ability of the WPCP to continue meeting RWQCB treatment standards. This impact would therefore be less than significant.

Mitigation: None required.

Impact UTL-2: Project demand for wastewater treatment could exceed the capacity of existing facilities (Less than Significant)

Based on preliminary analysis conducted by BKF Engineers and as described above, the Project would generate wastewater flows of approximately 38,287 gpd, an increase of 14,412 gpd of sewer demand in comparison to existing wastewater flows generated at the Project site. With a current capacity of 29.5 mgd and an average remaining capacity of 14.5 mgd, the City's WPCP has adequate capacity to treat projected wastewater flows. Additionally, the estimated wastewater flows from the Project site represents an increase of approximately 0.2% of the WPCP's average remaining capacity. Because the Project's estimated wastewater demand would be within the remaining available capacity and as the Project would be served by new and existing sewer lines in the Project site and surroundings, the Project would not require expansion of existing wastewater treatment facilities and the impact would be less than significant.

BKF Engineers monitored the existing 10-inch main on East Arques Avenue in the vicinity of the Project site and found that the main has a peak dry weather flow of 56 gallons per minute (gpm). The estimated peak wet weather flow for this pipe is estimated to be 63 gpm or 0.091 mgd. The City considers the existing main to be at maximum capacity when the pipe is 75% full. At 75% full, the existing main has an estimated capacity of 218 gpm or 0.313 mgd. Based on these estimates, the existing 10-inch main has 0.222 mgd available capacity (BKF Engineers, 2014)

Using a peaking demand of 4.0 times the average demand, the Project would increase the peak demand at the Project site from 0.060 mgd to 0.152 mgd, an increase of 0.092 mgd. Adding the increase in demand for the Project to the current estimated peak wet weather flow of 0.091 mgd would increase flow in the main to 0.243 mgd, which represents 77.6% of the 0.313 mgd estimated capacity of the main flowing at 75% full (or about 58% of the total capacity of the sewer main). The increase in flow would therefore be less than the available capacity of the existing 10-inch main, and the pipe has capacity to serve the increased flow of wastewater associated with the Project (BKF Engineers, 2014). Therefore, the Project would not exceed the capacity of the existing City sanitary sewer, and the impact on existing wastewater facilities would be less than significant.

Mitigation: None required.

Impact UTL-3: Stormwater runoff from the Project site could exceed the capacity of existing facilities. (Less than Significant)

As part of the Project, new 18-inch and 24-inch stormwater pipelines would be installed throughout the Project site and existing stormwater lines within the site would be removed. Stormwater lines from the Project site would connect to existing storm sewers beneath East Arques Avenue and North Wolfe Road (HOK, 2013). The Project would result in a decrease in impervious surfaces at the Project site, from the current site coverage of about 84%to about 63%. Therefore, there will be a decrease in stormwater runoff (see Impact HYD-4 in Section 3.10, *Hydrology and Water Quality*), and the Project would not exceed the capacity of existing stormwater drainage systems. The Project would therefore have a less-than-significant impact on the capacity of stormwater drainage facilities.

Mitigation: None required.

Impact UTL-4: Project demand for water could exceed available supply. (Less than Significant)

As described in the setting discussion above, existing potable water demand at the Project site is 38 afy or approximately 34,000 gpd (City of Sunnyvale, 2013d). At full build-out, the Project would result in a potable water demand of 29 afy, which represents a decrease of 9 afy in potable water demand compared to existing conditions. An additional 28 afy (24,747 gpd) of water supply demand would be met with recycled water, which would be used for flushing toilets, for mechanical equipment, and for irrigation. (BKF Engineers, 2013). The Project's recycled water system would connect to an existing recycled water pipeline that runs underneath North Wolfe Road. Operation of the proposed recycled water system would reduce the site's overall potable water demand. Because the Project's estimated potable water demand is less than the Project site's existing demand, the Project is not expected to require the expansion or construction of new water treatment or expansion of such facilities. The City has contracts in place and adequate supplies from SFPUC, SCVWD, groundwater, and recycled water to meet the Project's water demand (City of Sunnyvale, 2013). As such, Project-related impacts on the City's water supply system would be less than significant.

Mitigation: None required.

Impact UTL-5: Project-related waste generation could exceed the capacity of local landfills or conflict with local and State plans and regulations regarding solid waste. (Less than Significant)

Construction Impacts

Solid waste generated by construction of the Project would largely consist of demolition waste from the nine existing, 1-story commercial buildings (totaling 258,279 square feet), as well as construction debris. Using conversion factors presented in CalEEMod's Appendix A[1] (Calculation Details for CalEEMod) (2011), the Project would generate approximately 23,915 cubic yards of debris from building demolition. Assuming that approximately 9.07 acres of the Project site consists of pavement (approximately 1-foot deep) that requires removal, an estimated 15,000 cubic yards of existing pavement would be demolished. Assuming that demolition work would occur over a 3-month period (as described in Chapter 2, *Project Description*), approximately 324 tons of waste would be generated on a daily basis. Construction debris would also be generated during construction of the proposed new buildings and other facilities.

As described in the Setting section, prior to construction, the applicant would be required to obtain a demolition permit from the City's Building Division. The Building Division encourages applicants to include in their demolition plans provisions for deconstruction (i.e., building dismantling) and/or salvage of reusable building materials to minimize the amount of demolition materials disposed. For example, doors, lumber, fixtures, and mechanical units may be removed for reuse (City of Sunnyvale, 2013b). Mixed waste from construction sites is collected by the City's franchised waste hauler. Construction and demolition loads are brought to the SMaRT Station, where approximately 75%of the material is recovered and recycled (City of Sunnyvale, 2013c).

Because a large portion of construction and demolition debris would be recovered for recycling, the volume of debris that would require disposal in local landfills would be relatively small, and the Project would be consistent with the City's local solid waste requirements. Additionally, because adequate landfill capacity exists to accept the Project's construction and demolition waste, impacts related to landfill capacity would not be substantial. For these reasons, construction-related impacts on landfill capacity and the potential for non-compliance with local and State waste regulations would be less than significant.

Operational Impacts

CalRecycle reports numerous solid waste generation rates developed by a variety of jurisdictions throughout the State for both commercial and office uses. Using the square footage of proposed office and commercial uses (747,170 square feet and 30,000 square feet, respectively), and the generation rates of 6 pounds per 1,000 square feet per day for office uses (lb/1,000 sq ft/day) and 5 lb/1,000 sq ft/day for commercial uses, the Project would generate approximately 1.9 tons of solid waste per day (CalRecycle, 2013f). The City's franchised waste hauler, Specialty Solid Waste & Recycling, would provide recycling and garbage disposal services to the Project in the

[1] CalEEMod's Appendix A assumes that 1 square-foot of floor space = 10 cubic feet of original building volume; 1 cubic foot of building volume = 0.25 cubic foot of waste volume, 1 cubic yard building waste = 0.5 ton of weight.

long-term. The Project plans include a recycling center within the parking garage building, where recyclable materials would be stored separately from waste. Additionally, recyclable materials may be recovered from the collected mixed solid waste during the sorting process at the SMaRT Station. Therefore, much of the anticipated volume of waste generation would be recycled, not disposed in landfills. The Project would represent an incremental increase in collection and disposal of commercial and office waste, and would utilize approximately 0.1% of Kirby Canyon Landfill's permitted daily capacity and approximately 0.02% of the permitted daily capacity of the SMaRT Station, Kirby Canyon Landfill, Potrero Hills Landfill, and Zanker Road Landfill combined. As more than 30 years of remaining capacity at the Potrero Hills Landfill exist and since the City has alternative landfills that could be utilized, solid waste generated by the Project in the long-term would not substantially reduce existing landfill capacity. Therefore, operation of the Project would represent a less-than-significant impact on solid waste disposal.

Mitigation: None required.

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3.14 Public Services

Introduction

This section describes public services and facilities, including police, fire and emergency services, parks and recreation facilities, as well as public schools and libraries, and evaluates the potential effects of development of the Project on the delivery of public services, and possible adverse physical impacts on the environment that could result from a need to provide new or physically altered facilities.

Environmental Setting

Police, Fire Protection and Emergency Medical Services

Police, fire and emergency medical services within the City are fully integrated under the City's Department of Public Safety. All of the City's 198 sworn public safety officers are fully trained in all three disciplines. Within the Department of Public Safety, officers are assigned to either the Bureau of Police Services, the Bureau of Fire Services, or Bureau of Special Operations, however, they may be called upon to provide cross-bureau services on a daily basis. The Department of Public Safety has a total of 86 non-sworn personnel. On average, the Public Safety Department responds to approximately 100,000 calls for service per year (City of Sunnyvale, 2011).

Police Service

The Bureau of Police Services is located at 700 All America Way, approximately three miles from the Project site. The Bureau of Police Services has 84 sworn officers and is split into two teams of 39 Officers each, along with a Traffic Safety Unit budgeted for four Officers. Within the City, there are six police beats. The Project site is located within Beat 2 (Sunnyvale Department of Public Safety, 2013).

In 2012, the Bureau of Police Services received approximately 49,315 calls for service. The average response time was 4 minutes 53 seconds (Sunnyvale Department of Public Safety, 2013).

Fire and Emergency Medical Services

The Bureau of Fire Services provides fire suppression and prevention, emergency medical services, hazardous material incident mitigation, rescue operations, and state mutual aid response (City of Sunnyvale, 2013a). The City also has mutual aid agreements for fire protection with Santa Clara County, City of San José Fire, City of Mountain View Fire and City of Santa Clara Fire (City of Sunnyvale, 2011).

There are six fire stations located throughout the City. As described in Chapter 2, Project Description, the closest fire station to the Project is Fire Station 2, located across the street from the Project site at the corner of North Wolfe Road and East Arques Avenue.

The Bureau of Fire Services has 82 sworn officers. On average, the Bureau of Fire Services responds to approximately 7,300 calls for service annually. Of those calls, approximately 70% are calls for emergency medical service (City of Sunnyvale, 2011). In 2012, the Bureau of Fire Services responded to 6,516 calls for service with an average response time of 6 minutes 23 seconds (Sunnyvale Department of Public Safety, 2013).

The closest hospitals to the Project site that offer emergency medical services are El Camino Hospital, located approximately four miles southwest of the Project site at 2500 Grant Road in the City of Mountain View and Kaiser Permanente Santa Clara Medical Center, located approximately 4 miles southeast of the Project site at 700 Lawrence Expressway in the City of Santa Clara.

Schools

The City is served by four different public school districts: Sunnyvale School District, Santa Clara Unified School District, Cupertino Union School District and Fremont Union High School District. Among these four school districts, the City contains twelve public elementary schools, four public middle schools and one public high school. The Sunnyvale School District is the only district contained entirely within the City and includes eight of the City's twelve public elementary schools and two of the City's four public middle schools. In addition, there are nine private schools within the City (City of Sunnyvale, 2011). The Project site is located within the boundaries of the Fremont Union High School District and the Sunnyvale School District. **Table 3.14-1** shows total school enrollment information between 2010 and 2013, by district.

TABLE 3.14-1
SCHOOL DISTRICT ENROLLMENT

District	2010-2011	2011-2012	2012-2013
Cupertino Union School District	18,370	18,650	19,035
Fremont Union High School District	10,403	10,535	10,664
Santa Clara Unified School District	15,383	15,288	15,151
Sunnyvale School District	6,496	6,637	6,751
Total	**50,652**	**51,110**	**51,601**

SOURCE: California Department of Education, 2013.

Parks

City Facilities

The City of Sunnyvale owns and operates approximately 745 acres of open space and parkland (comprising approximately 7% of the City's land), including twenty neighborhood parks, two golf courses, and several other open space areas. In addition, the City maintains an additional 118 acres of playfields on school property in partnership with three local school districts. **Table 3.14-2** shows the distribution of the City's parkland among the different types of parks. In addition to these parks,

the City also operates the 1.5 mile Calabazas Creek Trail, a pedestrian and bicycle trail between U.S. 101 and S.R. 237, which provides a connection to the San Francisco Bay Trail (City of Sunnyvale, 2011).

TABLE 3.14-2
EXISTING PARK AND OPEN SPACE WITHIN THE CITY

Park	Number of Sites	Acres
Neighborhood Parks	20	223
School Open Space	19	118
Special Use Areas	9	355
Public Grounds	5	49
Total	**53**	**745**

SOURCE: City of Sunnyvale, 2011

City parks in the vicinity of the Project site include Fair Oaks Park and Martin Murphy Historical Park. Fair Oaks Park, located approximately 0.3 miles north of the Project site, is the closest City park to the Project site and includes basketball courts, a children's play area, multiuse fields, sand volleyball, a water play area and a skate park. Martin Murphy Historical Park, located approximately 0.8 miles east of the Project site, includes horseshoe pits, a tot lot, and outdoor stage and picnic facilities. San Miguel Elementary School and Bishop Elementary School, both located within one mile of the Project site, offer open space playing fields.

As described below, the City's General Plan sets forth the goal of providing and maintaining adequate and balanced open space and recreation facilities for the community (Goal LT-8). Considering the City's 2013 population of approximately 146,000 (City of Sunnyvale 2013b), the City currently provides approximately 5.1 acres of park and recreation space per 1,000 residents. This service ratio is within the National Recreation and Park Association's recommendation of between 4 and 6 acres of parkland per 1,000 residents (City of Sunnyvale, 2011).

Regional Facilities

Santa Clara County Parks and Recreation Department includes 28 parks encompassing nearly 45,000 acres. These parklands provide habitat for birds and other wildlife as well as recreational and educational opportunities for the public. The closest County parks are Rancho San Antonio County Park in the City of Cupertino and Alviso Marina County Park located in the City of San José. Rancho San Antonio County Park, encompassing approximately 165 acres, provides opportunity for a variety of activities including hiking, bicycling and horseback riding. Alviso Marina County Park encompasses approximately 19 acres adjacent to the Don Edwards San Francisco Bay National Wildlife Refuge and offers a network of pathways and boardwalks with views of the bay, mountains and a variety of wildlife (Santa Clara County, 2013).

Approximately 3.5 miles of the San Francisco Bay Trail run through the City along the Bay shoreline adjacent to the Sunnyvale Water Pollution Control Plant (City of Sunnyvale, 2011). The

Bay Trail is a planned recreational corridor operated and maintained by the Association of Bay Area Governments that will encircle the San Francisco and San Pablo Bays with a continuous 500-mile network of bicycling and hiking trails when completed (Bay Trail, 2013). Public access to the San Francisco Bay Trail is provided at the trail head located off of Borregas Avenue and Caribbean Drive.

Libraries

The City operates one public library, the Sunnyvale Library, located in the City's Civic Center. The library offers a collection of books, compact discs, music, DVDs, magazines and newspapers and digital resources for the community. The library also offers meeting space and study areas for small and large groups (City of Sunnyvale, 2011). The library is in need of updating to house the library's expanding collection, to incorporate new technologies, and to accommodate population growth that has occurred since the library was built in 1960. The City is currently investigating options to expand library services within the community, including the possibility of developing a new main library or a new branch library (Sunnyvale Public Library, 2007).

Regulatory Framework

State Regulations

California Fire Code

The California Health and Safety Code, §13000, et seq. includes regulations concerning building standards (as also set forth in the California Building Code), fire protection systems, fire protection devices (such as extinguishers and smoke alarms, and high-rise building standards), and standards for building inspection and certification.

Senate Bill 50

The Leroy F. Greene School Facilities Act of 1998, or Senate Bill 50 (SB 50), restricts the ability of local agencies to deny land use approvals on the basis that public school facilities are inadequate. SB 50 authorizes school districts to levy developer fees to finance the construction or reconstruction of school facilities to address local school facility needs resulting from new development. SB 50 establishes the base amount of allowable developer fees for school impacts. In January 2012, the State Allocation Board (SAB) increased Level 1 Fees to $0.51 per square foot of enclosed and covered space in any commercial or industrial development and $3.20 per square foot for residential development (SAB, 2012). When an elementary school district and a high school district serve the same area, the sum of their fees is subject to these maximums. Per an existing fee revenue sharing agreement between the Fremont Union High School District and the Sunnyvale School District, which serve overlapping portions of Sunnyvale, Sunnyvale School District receives 61.8% of the total fee amount, and Fremont Union High School District receives 38.2% of the total fee amount. Therefore, Sunnyvale School District's potential share of the maximum fee for commercial development is $0.32 per square foot while Fremont Union High School District's share is $0.19 per square foot (Sunnyvale School District, 2013; Fremont Union High School District, 2012).

Local Plans and Policies

City of Sunnyvale

City of Sunnyvale General Plan

Policies from the City's General Plan, which was consolidated in 2011, that relate to public services are listed below.

Citywide Vision Goal:

- ***Long-Range Planning*:** To engage in long-range physical, fiscal and economic development planning so as to create and sustain an outstanding quality of life in a community with appropriate balances between jobs and residences, development and supporting infrastructure, and the demand for services and the fiscal ability to provide them.

Land Use and Transportation:

- ***Policy LT-4.14*:** Support the provision of a full spectrum of public and quasi public services (e.g., parks, day care, group living, recreation centers, religious institutions) that are appropriately located in residential, commercial, and industrial neighborhoods and ensure that they have beneficial effects on the surrounding area.
- ***Goal LT-8*:** Adequate and Balanced Recreation Facilities. The City strives to provide and maintain adequate and balanced open space and recreation facilities for the benefit of maintaining a healthy community based on community needs and the ability of the city to finance, construct, maintain, and operate these facilities now and in the future.

Community Character:

- ***Goal CC-4*:** Accessible and Attractive Public Facilities. Provide public facilities which are accessible, attractive and add to the enjoyment of the physical environment.
- ***Policy CC-4.2*:** Maintain beautiful and comfortable outdoor public places which provide a shared sense of ownership and belonging for Sunnyvale residents, business owners and visitors.
- ***Policy CC-7.2*:** Maintain a full service Library adequate to meet community needs.
- ***Goal CC-12*:** Maximize Access to Recreation Services and Amenities. The City strives to maximize access to all of its services, facilities and amenities.
- ***Policy CC-12.1*:** Locate services at schools, parks and recreational facilities throughout the City and utilize strategies, such as the mobile recreation.

Safety and Noise:

- ***Goal SN-3*:** Safe and Secure City. Provide a safe and secure environment for people and property in the community by providing effective Public Safety response and prevention and education services.
- ***Policy SN -3.1*:** Provide rapid and timely response to all emergencies.
- ***Goal SN-5*:** Effective Fire Service Response System. Provide a fire service response system that will control the spread of fire in buildings and other properties and maintain minimal casualties and property loss from fire and other related emergencies.

- ***Goal SN-6*:** Effective Emergency Response Capability. Provide effective response capability for emergency medical events and other non-fire incidents that may directly endanger the lives, property and well being of the community.

City of Sunnyvale Fire Code

The Fire Code for the City of Sunnyvale (Sunnyvale Municipal Code, Chapter 16.52) contains standard requirements regarding fire protection systems, fire protection devices and building design, and requires development projects within the City to undergo review from the Fire Marshall prior to occupancy.

Impacts and Mitigation measures

Thresholds of Significance

Consistent with CEQA *Guidelines* Appendix G the Project could have a significant impact if it would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:

- Fire protection
- Police protection
- Schools
- Parks
- Other public facilities

Approach to Analysis

The environmental impact analysis for public services in this EIR involves an assessment of existing public services standards and capacity as well as existing public school resources and enrollment data. To complete the analysis, the EIR preparers corresponded with the various agencies to request current information about service capabilities, service ratios, response times, performance objectives; reviewed web-based information; and acquired and reviewed school enrollment data from the California Department of Education.

Impact Analysis

Impact SRV-1: Development of the proposed Project could result in an increase in demand for police services. (Less than Significant)

Impacts on police services are considered significant if an increase in population, employment or development levels would result in inadequate staffing levels, response times and/or increased demand for services that would require the construction of new or altered facilities that might have an adverse physical effect on the environment.

Implementation of the Project would increase land use intensity and the density of development on the Project site. As described in Chapter 2, Project Description, the Project would result in a net increase of approximately 519,000 square feet of occupiable floor area and would generate approximately 2,500 jobs (about 2,100 net new jobs above the existing development at the Project site). The increase in daytime population of the Project site and surroundings could generate additional calls for police services and a need for additional patrol time related to crime, traffic and parking. However, the Project is intended to support a headquarter-style technology campus that would attract leading-edge technology clients. This type of redevelopment could serve to revitalize the area and could help to minimize any increase in criminal activity within and near the Project site. In addition, as part of the City's development review and approval procedures, the Department of Public Safety will review the proposed site plan and provide recommendations related to security features and opportunities to reduce crime.

Given that the type of proposed development is unlikely to attract crime or otherwise substantially increase demand for police services, and given the requirement for Department of Public Safety review, any increase in the demand for police services related to the Project can be expected to be minor and incremental, and would not be expected to result in the need for new police facilities or to reduce response time. Therefore, the impact on police services would be less than significant, and no mitigation is required.

Mitigation: None required.

Impact SRV-2: Development of the proposed Project could result in an increase in calls for fire protection and emergency medical response services. (Less than Significant)

Impacts on fire protection services and emergency medical services are considered significant if an increase in population, employment or development levels would result in inadequate staffing levels, response times and/or increased demand for services that would require the construction of new or altered facilities that might have an adverse physical effect on the environment.

As described above under Impact SRV-1, implementation of the Project would result in an increase in occupiable floor area and an increase in employment at the Project site. This development could generate an increase in demand for fire protection and emergency services at and around the Project site.

Development of new structures on the Project site would be required to meet standard fire code requirements, ensuring that the Project will include required design features and will provide adequate infrastructure for firefighting services. The Bureau of Fire Services will also review the proposed site plan and provide recommendations regarding design features to reduce fire hazards.

The increase in employees generated by the Project could result in an incremental increase in calls to the Bureau of Fire Services for emergency medical services; however, the Project would increase employment in Sunnyvale by approximately 2,200, or about three percent of the 2010

total of about 78,000. Moreover, job growth resulting from the Project would comprise between 7% and 15% of already forecast citywide employment growth by 2025.[1] Therefore, any increase in calls for fire suppression and emergency medical services is expected to be relatively small in the context of citywide demand and thus would not be expected to substantially increase response times or result in the need for new facilities. When needed, ambulance and paramedic units can transport patients to local hospitals; therefore, the Project could also result in an increase in demand for medical services at El Camino Hospital, Kaiser Permanente Santa Clara Medical Center or other nearby hospitals. However, given that these hospitals already serve the City of Sunnyvale and surrounding communities, any increase in the demand for emergency medical services at these hospitals related to the Project can be expected to be minor and incremental, and would not be expected to result in the need for new facilities.

Therefore, the Project would not be expected to result in a substantial increase in the need for fire protection and emergency services, and the impact on such services would be less than significant.

Mitigation: None required.

Impact SRV-3: The Project could result in increased enrollment in area schools. (Less than Significant)

As discussed in Section 3.2, *Population and Housing*, the Project is expected to increase employment and therefore population in and around the City of Sunnyvale. This can be expected to result in an increase in the number of school-aged children and increased enrollment in area schools.

Employees at the Project site may be expected to live throughout the region. Therefore, increased enrollment can be expected to be spread across several school districts. Children of employees living in the City of Sunnyvale would most likely attend schools within the Sunnyvale School District or the Fremont Union High School District. These two school districts employ student generation factors as a basis for determining the number of students that could be generated by a proposed project. If these factors are applied to the Project, the approximately 2,100 new employees generated by the Project—if all new residents to the City—could result in up to approximately 40 new students for Sunnyvale School District and 30 new students for Fremont Union High School District (Sunnyvale School District, 2013; Fremont Union High School District, 2012). As described above under Environmental Setting, to mitigate potential impacts resulting from an increase in students, both districts levy development fees for commercial development pursuant to SB 50. Pursuant to SB 50, payment of development fees for schools is considered full and complete mitigation for the impacts of a development project on school facilities. Payment of the adopted development fees ensures that the Project would result in less-

[1] The higher percentage is based on ABAG projections, while the lower percentage is based on City forecasts of greater growth; see Section 3.2, Population and Housing.

than-significant impacts related to the provision of school facilities. As a result, the Project's impacts on schools would be less than significant.

Mitigation: None required.

Impact SRV-4: Implementation of the Project could result in increased use and degradation of existing parks and recreational facilities. (Less than Significant)

As described above under Environmental Setting, the Project site is within walking distance of Fair Oaks Park and within driving distance of Martin Murphy Historical Park, as well as the playing fields at San Miguel and Bishop elementary schools. It is possible that new employees of the Project site would use these facilities, resulting in an incremental increase in the use of these facilities.

However, as described in Chapter 2, Project Description, the Project would include on-site recreational facilities including a fitness center and a central quad with trails for pedestrians and bicycles. It is anticipated that during the work day, employees would primarily utilize these facilities because they are located on-site. Thus, it is not anticipated that employees working at the Project site would substantially contribute to increased use of nearby parks to the degree that deterioration of these facilities would occur.

It is also likely that the Project would indirectly result in population in and around Sunnyvale, as discussed in Section 3.2, *Population and Housing*. This could affect the ratio of parkland to residents. However, given that the number of jobs generated by the Project represents a very small fraction of the current population of the City (less than 0.02%), an influx of residents due to jobs generated by this Project would not be expected to meaningfully decrease the ratio of parkland to residents. Furthermore, employees can be expected to live throughout the region, not just in the City of Sunnyvale.

Most of the visitors to nearby regional parks, including Santa Clara County parks, are residents of Santa Clara County. Santa Clara County parks receives on the order of three to four million visitors per year. The additional 2,100 employees that would be generated by the Project would represent an increase of less than 0.1% in the current number of users of Santa Clara County parks (Santa Clara County Parks and Recreation Department, 2003). Although new employees resulting from the Project could incrementally increase the use of both local and regional existing parks, the additional use of regional facilities would not be expected to result in substantial deterioration of these facilities. As a result, the Project would have a less-than-significant impact on local and regional parks.

Mitigation: None required.

Impact SRV-5: The Project would include the construction of recreational facilities which could have an adverse impact on the environment. (Less than Significant)

As described above, the Project would include on-site recreational facilities including a fitness center and central quad with pedestrian and bicycle paths. Construction of these proposed recreational facilities has been evaluated as part of the overall Project. The impacts of construction of these proposed recreational facilities and, as needed, mitigation measures and other construction related regulatory requirements, are discussed throughout this EIR. Construction-related impacts in any single location would be temporary but, in some cases, would result in significant environmental impacts; however, the on-site recreational facilities would represent a very small proportion of the overall Project development and would contribute minimally to any impacts, such as those on air quality. Therefore, construction of the planned recreational facilities, as part of the Project, would not result in any substantial adverse impact.

Mitigation: None required.

Impact SRV-6: Development of the Project could result in increased use of other governmental facilities, including libraries. (Less than significant)

The Project could result in approximately 2,100 additional employees. This increase in employees in the Project area could cause an increase in demand for library services. The existing Sunnyvale Library receives approximately 700,000 visitors per year (Sunnyvale Public Library, 2007). The new employees supported by the Project would represent approximately 0.4% of the library's total annual visitors. Therefore, the additional library demand generated by the proposed Project would be a small percentage of total library visitors, and the Project's impact on library services would be considered less than significant. Increases in use of other governmental facilities and services would likewise be expected to be minor, incremental, and less than significant.

Mitigation: None required.

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